KNOWLEDGE, ORGANIZATION AND THE DIVISION OF LABOUR:
EVALUATING THE KNOWLEDGE CLASS IN CANADA

by

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for the degree of Doctor of Philosophy
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Ontario Institute for Studies in Education
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Abstract

This dissertation explores the claim that, in advanced capitalist countries like Canada, a powerful knowledge class is assuming increasing dominance within the social relations of production. Attached to such theories are claims of trends toward post-bureaucratic organizations, rising job complexity and autonomy, and increased power within operational and strategic decision-making processes. In my study I focus on Canadian “specialist” employees (professionals and semi-professionals) and managers. I present aggregated and disaggregated data from two Canadian surveys conducted in 1983 and 2004 and complement this with original interviews with information technology (IT) workers and engineers. I find a seeming paradox within the labour process of specialists and managers, with task-level autonomy declining even as job complexity and involvement in organizational decisions are rising. I provide evidence that imperatives for profit/cost effectiveness are leading to efforts to make specialist and managerial labour and knowledge more transparent, integrated, and manageable, but this is not the same as degradation or proletarianization. In contrast to my expectation, I find boundaries in the division of labour are durable despite this “socialization” of many labour processes. I argue that a specialist-and-managerial class (SMC) exists in Canada, and will continue to exist, though it
is subordinate to and exploited by the capitalist elite even as it excludes and exploits the working class through occupational closure and credential barriers. The SMC is thus contradictory, internally heterogeneous and fraying at its borders, but simultaneously resilient. The resiliency comes via possession of specific strategic knowledge and consequent ability to secure rents and/or control specific organization assets via delegated authority. Resiliency is also structural, with management in many organizations retaining an interest in separating planning and design (“conception”), on the one hand, from process and completion (“execution”), on the other, in order to maximize efficiency and productivity through more centralized control.
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Introduction

Lamented, celebrated, dismissed, the idea of a powerful new knowledge class has been a recurrent theme in philosophy and the social sciences (Barbrook, 2006; Szelenyi & Martin, 1988; Wuthnow & Shrum, 1983). The idea of society run by a knowledge-elite found ancient form in Plato’s philosopher-kings, and then in Francis Bacon’s fantasy of a new Atlantis organized around a non-democratic meritocracy populated by the best and the brightest scientists, engineers, and philosophers. One of the objectives fuelling Enlightenment thinkers like Voltaire was the deconstruction of power based on tradition and religion, to be replaced with leadership based on knowledge and wisdom (see Durant, 1961). There have also persisted, however, those skeptical that human freedom will be enhanced under the rule of technicians and technocrats. Over the last 100 years or so, sociological concern with a new class has resulted in a diverse collection of competing theories1 portraying those with specialized knowledge as, variously: a desirable and altruistic knowledge class whose emergence will benefit society; a tyranny of expertise usurping the capitalist class while exploiting the working class; a vanguard of the working class; a middle class subordinate to the capitalist elite but exclusive of the working class; and as “contradictory class locations” that defy theoretical or

1 Out of the many nuanced positions and overlapping “new class” arguments, I have attempted to identify broad perspectives that make clear the historically repetitive nature of theorizing the power and class-location of specialized occupations. These camps, it should be acknowledged, often do not follow the traditional distinction between (neo)Marxist and (neo)Weberian class analysis, and just as often did and do create divisions among those researching within a given theoretical tradition.
empirical boundaries (vis-à-vis ambiguity in ownership and control over resources and labour power). The evidence upon which these claims are made varies greatly in quality, both within and between the various “camps.” In many instances the evidence depended upon speaks to capacity (e.g., educational attainment as proxy) rather than activity (e.g., direct measures of skill requirements and power).

Of the various new class camps, those theorizing an altruistic, powerful knowledge class have dominated mainstream business and policy discourse. For example, in 2009 the Government of Ontario commissioned Roger Martin, dean of the Rotman School of Management at the University of Toronto, and Richard Florida, director of the Martin Prosperity Institute at the Rotman School, to study how the province can enhance its global competitiveness. The report, titled Ontario in the Creative Age (2009), argues that the occupational structure in Ontario is shifting away from routine-oriented jobs and toward professional and semi-professional “creativity-oriented” jobs that demand knowledge, analytical skills and judgment. While this shift is ultimately “inevitable” for Martin and Florida, they use a variety of occupational, industrial and wage measures to conclude that creative jobs are appearing too slowly in the province and are undervalued compared to similar jurisdictions in North America. They urge government, business leaders and workers to alter policies in order to: a) speed the acquisition of human capital by citizens; and b) implement incentives encouraging employers to cultivate creative occupations.

While carefully omitting any mention of class, the report nevertheless builds in an obvious way on Florida’s well-known “creative class” thesis (2002) in which he
argues that creativity (as the “application of knowledge”) is the key source of economic innovation and growth, and thus determines comparative advantage among cities, regions and countries. Florida’s work on the creative class and the public policy recommendations that have emerged from it are rooted in a belief of disjuncture with the past, based primarily on shifting occupational composition and the decline of manufacturing, rising educational attainment, expanding budget allocations to research and development, and skyrocketing patent activity. Florida interprets these phenomena as indicative of dramatic shifts in how work is performed, the type of skills required, and the growing power of those who possess both economically important knowledge and the capacity for creative application of this knowledge.

Florida’s creative class is but another iteration of the contemporary “powerful knowledge class” thesis. Among those proposing such a theory, there is the generally held belief that organizations’ need for competitive advantage and profit-maximization has created a situation where a distinct “class” of specialized workers are—in contrast to the service and industrial workers who make up the working class—largely immune to traditional strategies used to reduce labour costs via the division of labour, job simplification, routinization, managerial oversight, and rigid bureaucratic procedures. Relatively modest versions propose that knowledge is now equal to financial wealth in structuring power in the workplace. Extreme versions argue these workers now enjoy de facto control over the means of production via their ownership of knowledge and problem-solving skills.
Assessing Competing Knowledge Class Claims: A Brief Sketch

In Canada, like most advanced capitalist nations, there is broad agreement that scientific and technical knowledge is gaining a more central role in nearly all organizations’ productive and administrative processes. Solid evidence suggests organizations are seeking and responding to labour processes increasingly mediated by and dependent upon sophisticated technologies, oriented around the management of vast quantities of information, and connected via global communication and production networks. Formal postsecondary educational opportunities and attainment have expanded significantly in Canada at the same time that managerial, professional and semi-professional jobs have steadily increased over the last century, both in an absolute sense and as a share of the occupational mix. Yet the consequences for specialists and managers are disputed. Is the application of knowledge by such workers now so central to productivity and profit in the so-called knowledge-based economy that it is fundamentally altering social relations in many Canadian workplaces? Or are specialists and managers facing pressures that constrain their autonomy and deconstruct the professional and/or credential mechanisms that create closed labour markets? Or are the consequences some uneven combination of these trends?

These relatively specific, labour process-based questions are built into the broader, core research question that shapes this thesis: in Canada, does a knowledge class exist and, if so, is it assuming increasing dominance within the social relations of production? The goal of this dissertation is to critically evaluate the competing knowledge class theories through the use of direct measures of specialists’ and
managers’ job complexity, work-related activity and relations of control. Such an
approach contrasts with many of the knowledge class theories, which too often use
indirect measures like educational attainment or generalized job description as
proxies for conclusions on autonomy, organizational power, and/or class location.
To this end I use nationally representative surveys from 1983 and 2004 to explore
changes in division of labour, with emphasis on measures related to specialists’ and
managers’ complexity of work, task-level discretion, and involvement in
organization decision-making. I examine how these measures vary by
organizational size, sector of employment, and type of occupational closure. I
combine this quantitative data with findings from original interviews with Canadian
information technology (IT) workers and engineers. I choose specialist (i.e.
professional and semi-professional) and managerial occupations, generally, and IT
workers and engineers, specifically, not because I believe they are somehow more
important than other workers. Rather, I theorize that any changes in the labour
process of these privileged workers are an important indicator that adds to a
general understanding of the extent to which the social relations of production
within a capitalist framework are changing, and can change.

If the importance of knowledge in processes of production and distribution is
in fact leading to secular, discernible change in class relations and the class
structure, this would suggest deep problems with critical political economic
critiques of capitalism. Flowing mainly from the Marxist tradition, capitalism is
frequently portrayed as a globalized, structurally coherent system in which a tiny
minority of owners and elite managers are compelled by competition to constantly:
1) restructure the technical and social organization of production in order to stay competitive while; 2) reducing both the need for costly labour and the necessary skill of the remaining employees in order to reduce wage demands and increase centralized control. If, in contrast to theories of the knowledge class and post-bureaucratic structures, “class processes” of routinization and knowledge centralization are appearing among supposedly “high skill” employees, it would suggest that postindustrial theses of a powerful knowledge class are simplistic and inattentive to tendencies within capitalism that make class conflict over job control and participation in strategic decisions an inherent feature. I hypothesized that the latter is largely true and increasing numbers of specialists are vulnerable to the routinizing and centralizing tendencies that impact other employees, and that specialists are growing increasingly heterogeneous, both intra-occupationally and inter-occupationally. Picking up on Erik Olin Wright's work, I further hypothesized that class boundaries between the capitalist elite and senior managers/top specialists and between specialists/managers and the working class are empirically and theoretically ambiguous and not defensible.

**Main Claims and Evidence.**

The combination of quantitative and qualitative data suggests growing job complexity for all occupational groups, including specialists and managers. Yet, at the same time, findings suggest that traditional, industrial, and hybrid strategies are being applied to specialized workers and managers in pursuit of greater flexibility and (senior) managerial control. Some, like IT workers, are experiencing or threatened by classic industrial strategies of knowledge centralization,
routinization, fragmentation, externally set deadlines and close surveillance. Growing numbers of IT workers are also experiencing rising precariousness, their work at threat of outsourcing, simplification, or even automation as other IT workers improve work-flow software and begin turning their rationalizing gaze on each other. Even for those specialists enjoying more classic professional protection (i.e., occupational closure) there are ongoing, albeit uneven and limited efforts to increase efficiency through rational strategies. Closure tends, however, to decrease risk of such strategies. Overall, findings from specialist and managerial groups present a contradiction: as a group, over the last two decades they experienced significant increases in involvement in organizational decision-making even as levels of autonomy-control declined.

I argue that Paul Adler’s reading of Marx’s theory of the rising contradiction between the forces and social relations of production, a reading with significant structural determinist tendencies, appears to best explain the directionality of findings. Stressing collaboration, the opening up of protected and privatized knowledge, and contingency, such a theory predicts the “socialization” of the labour process will result in the working class experiencing rising job complexity, job autonomy, and involvement in organizational decision-making. My qualitative and quantitative data support this trend. What Adler’s theory also predicts is a loss of autonomy for specialists and managers but not a reduction in job complexity or participation in organizational decision-making. Rather, the speed and complexity of work is leading to greater collaboration but also greater oversight. My evidence also supports this claim. This socialization increases the percentage of the entire
workforce engaged in challenging work but potentially undercuts the privilege of an increasing percentage of managers and specialists. While specialists have gained somewhat greater access to processes of organizational decision-making, almost half remain entirely excluded. Managers also appear firmly embedded in organizational hierarchy. While some specialists and mid-level managers move into senior managerial roles (or open private-practices) most do not and remain outside the organizational elite that make strategic decisions. I argue that theories of a knowledge class taking over the levers of economic activity are thus not supported.

There is a tension in my evidence, however, between trends in class relations and boundaries (i.e., socialization and deprofessionalization) and the nature of class relations and boundaries at this time. Put a different way, socialization may be the case but this does not necessarily mean my hypothesis is correct that class distinctions among managers, specialists and other workers have become blurred beyond theoretical and empirical justification. I argue that a major failure of the socialization thesis, stressing as it does interdependence and upgrading, is that it does not adequately recognize the ability (i.e., agency) of specialists and managers to maintain mechanisms like closure and/or well-defined divisions of labour within bureaucratic hierarchies. While Braverman’s influential degradation thesis appears to lack explanatory power in terms of directionality, I argue that his primary concern was with control over the labour process as a whole. That is, work is degraded anytime a worker is divorced from strategic and high-level operational decisions. If one reads Braverman in this way, rising task-level complexity and discretion and delimited involvement in some organizational decisions does not
fundamentally alter the overall social relations of production or the divisions of labour among managers, specialists and the working class. Despite relatively large gains in complexity, autonomy and involvement, many in the working class remain excluded from or only superficially involved in the operational decisions shaping the broad context of their work.

My findings, I argue, suggest the ongoing existence of a specialist-and-managerial class (SMC), relationally distinct from the working class. With regards to involvement in organizational decision-making, data from the surveys and the interviews reveal large and important differences between the working class and more involved managers and specialists, especially those specialists like engineers who have attained legislated professional closure. Measures of autonomy also suggest socialization (or deprofessionalization) but differences remain substantial between managers and specialists and the working class. The work of the SMC is oriented to coordination and design and they use closure, credentialism and real and perceived composite rents (where employee and employer have an interest in maintaining their relationship) to maintain their privilege within the relations of production. Findings from my interviews with IT workers and engineers, and supported by other research, suggest that managers and specialists continue to play a significant and even growing role in geographically dispersed labour processes, and that their work may become even more valued even as self-management and collaboration grows at the operational and task level.

My argument regarding the class location of managers and specialists has much in common with Erik Olin Wright’s well-known theory of contradictory class
locations. Similar in attending to exploitation among the employed, and to contradictions experienced by specialists and managers, my work departs from Wright’s work in arguing for the existence of durable, identifiable boundaries around a middle class. I agree with Wright’s second class-formulation that proposes those who control skills and “organizational assets” engage in exploitation of those who do not have recognized access to such assets. The SMC is thus both exploited and exploiter, having built fairly durable boundaries that perpetuate their ability to claim rents at the expense of the working class.

The Structure of the Dissertation

*Chapters One, Two and Three* form Part I, my review of the literature. *Chapters Four and Five* form Part II and present my theoretical approach, hypothesis and methods. *Chapters Six and Seven* form Part III, where I present my quantitative and qualitative findings. *Chapter Eight*, my discussion, is Part IV. I finish with a Conclusion where I identify limitations of this project and further research suggested by my findings.

In *Chapter One* I examine the growth in size and informational needs of public and private organizations and, in the early 20th century, the development of rational systems like scientific management and bureaucracies. Later in that century came the debate over “managerial capitalism,” where it was argued ownership was increasingly separating from managerial rights and obligations. I also chart the rise in demand for administrative, professional and scientific employees and the general increase in formal educational attainment in the latter half of the 20th century. In *Chapter Two* I briefly review the history and main arguments animating class
analysis, including the foundational contribution of Karl Marx and Max Weber. In reviewing Marx and Weber I pay particular attention to issues of class formation and criteria, the class location of those with specialized knowledge, and the tension between structure and agency in explaining socio-economic transformation. I outline in some detail the competing camps in the new/knowledge class debate and show how theories introduced in the early and middle parts of the 20th century continue to enjoy currency even if appearing under different labels. In Chapter Three I review the development of labour process (LP) theory, a body of critical work that links changes in the productive and distributive systems with broader critiques of capitalism and with class analysis. I selectively link LP theory to mainstream and critical theories on organization and management, and close the chapter by reviewing qualitative and quantitative research on skill, organizational change and the social relations of production.

In Chapter Four I outline my conception of class, one that merges Marxian concerns around exploitation with Weberian concerns around occupational closure and bureaucracy. I do not (at this time) align myself with the teleology inherent in some Marxisms. I do, however, find Marx’s identification of the origins of class conflict undeniable: the wealth of the elite, who have legal or contractual rights to profit, is based on the material deprivation of those they employ. More for one group means less for the other, and thus class and exploitation originate at the point of production. But class relations in the workplace are not only about a simple binary of owner-worker. I argue that different groups of workers have varying capacity to make claims for control over their work and for a share of profit.
Incorporating more Weberian concerns, I argue this must be accounted for in the study of class relationships. Those with abilities and knowledge that are both demanded and scarce have more control over their working conditions than those with generalized skills. This leads to different and sometimes incompatible interests, to efforts of occupational closure, and to individual and collective struggle.

How this translates into a class structure and then possibly into class struggle is a matter of historical specificity. I reject purely structuralist accounts of class structure that see no need for a subject or empirical research. I also reject purely “realist” proposals that classes only exist when recognized by those within them. “Class” is not a thing, nor a static location: it is a complex relationship amongst real people with varying and structured levels of access to control over their working lives. Even when classes are not recognized, in an active and conscious way, in capitalist societies like Canada “class processes” that maintain exploitative relations (i.e., subordination, centralization and deskilling) are operating and discernable. Class identification, and action based on class identification, is thus contingent, often rife with contradiction, and not linear, impacted deeply by local and national factors and mediated by other differences like gender, race, religion, and so on. Such a conception of class necessitates engagement with the lived experiences of specialist employees, and their relationships with management and non-specialist employees. Proxies such as occupation or educational attainment are part of the evidence, but don’t tell us much about what is actually happening in the labour process, including: ongoing restructuring, demands for knowledge, opportunities for discretion and engagement with strategic decisions, or how
technology is being used. Such proxies tend to lead to a simplistic operationalization of what constitutes knowledgeable or skilled work, a concept that I argue is inherently multidimensional, encompassing not only the complexity of the task but also opportunities to make decisions, design one’s work, and acquire and apply new knowledge. I close the chapter by outlining my hypothesis (as outlined above).

In *Chapter Five* I operationalize the concepts identified in Chapter Four and then describe and justify my mixed-methods approach. I compare data from two Canadian, nationally representative surveys. The first is the Canadian Class Structure (CCS) survey conducted in 1983; the second is the Work and Lifelong Learning (WALL) survey conducted in 2004. Both provide occupational and educational information as well as self-reported data on opportunities to design work, opportunities to participate in organizational decisions, and the delegation of managerial authority. The WALL survey provides further measures on the demand for new skills and the impact of technological change in the workplace. Each of these issues is investigated in further depth via interviews with IT workers and engineers, some of whom were identified via their participation in the WALL survey. Why engineers and IT workers? These two groups were chosen because they are both at the heart of theorizing on the knowledge class and, or perhaps because, they are situated at the centre of techno-social restructuring—their jobs often are not to “make things” but to make more efficient the technical and social features of the labour processes. They differ, however, in important ways. While engineers in Canada have not been as successful as doctors and lawyers in their “professional project,” they nonetheless represent a stable and relatively well-protected
profession with strong control over access to the profession and application of relatively stable engineering knowledge, particularly when compared with engineers in other countries. Conversely, IT work is an emerging profession, including many semi-professional and "skilled" technical occupations, and there is little collective control over the rapidly changing knowledge base. Interviews were conducted with six participants from each occupational group. A number of participants were interviewed several times. The participants varied in age, sex, race and sector. While there have been many studies in Canada and elsewhere examining specific professional groups, or comparing professional groups, no study that I know of has combined national data with in-depth interviews to examine the labour processes and class location of specialists in general, and engineers and IT workers in particular.

In Chapters Six and Seven I present my findings, described above. Chapter Eight is my discussion where I link findings to Marx’s theorized contradiction between the forces and relations of production. I explore the agential and structural limits for the “socialization” of specialist and managerial labour, and how fairly durable divisions of labour continue. I close the chapter by relating my argument that an SMC persists to competing and complementary new class theories. In the Conclusion I summarize my findings and discussion. I go on to recognize the “limitations” of my research and theorizing, notably a) the limited number of variables used to draw conclusions about changes over the last few decades and b) the inability to directly observe the relationship among specialists, managers and the working class based on my methodological approach (i.e., I use surveys and
interviews, but not ethnographic research). A number of these limitations figure in the “further research” identified and implied by this dissertation, including further comparative research on specialist occupations, how “expert” software is being integrated into specialists’ labour vis-à-vis routinization and centralization, and if increasing job design and involvement for the working class is coming at the expense of specialists and managers.

**Standpoint**

I began my doctoral studies with an interest primarily in teachers’ work, particularly the relationship of technology and central control for both the quality of their work and the sort of education necessary for a healthy democracy. Encouraged by my advisor, D. W. Livingstone, to think more broadly about the work and power of professionals and semi-professionals, my doctoral research morphed into a skeptical evaluation of contemporary knowledge class theories, Florida’s the most recent. My parents are teachers, I have worked as a policy analyst in the public sector and a contract “sessional” instructor at various universities, and I have many friends and acquaintances from my time in Toronto and Vancouver who are in specialist occupations like law, engineering, IT, medicine, education, communication and law enforcement. My experiences and observations, in combination with the ambivalence many voice about their work, helped shape the skepticism inherent to my research questions. I began with an approach to class that merged Marx and Weber, but tended to the Weberian in focusing on domination, authority and autonomy. The reading, research, and interaction with colleagues that occurred as a result of this project have led to a view of class that continues to be a hybrid but is
more attuned to exploitation. I approach much more critically the role specialists and managers play in creating and maintaining the systems that make so many jobs dull and/or low paying, and which often waste so much talent. My standpoint has shifted, becoming more radical and Marxist though not dogmatic and clearly not orthodox.
Part 1 – Review of the Literature: Class, Knowledge and Capitalism
Introduction

The goal of this project is to develop a more robust understanding of whether a “creative” or “knowledge” class exists in Canada, and what sort of power those in specialist and managerial occupations have within the social relations of production. This chapter is primarily historical and descriptive; my goal is to recognize the early contours of the contemporary “knowledge-based economy” (KBE), particularly the occupational, labour process and organizational trends that have been implicated in shifting relations of power in Canadian workplaces. The point is to provide a relatively brief, historical context for the historical and contemporary new class theorizing reviewed in Chapter Two. I pay particular attention to engineers and information technology workers, their role in developing and implementing rational work systems, and the progressive socialization of their labour. Specifically, this chapter traces the rise of those occupations involved in the application of scientific, technical and managerial knowledge, the relationship that formed between these employees and owners and between these employees and the mass of workers who performed manual or routine clerical and administrative work. The focus is on the value of complex social and technical knowledge to capitalist organizations and efforts by workers who possess such knowledge to formalize and maintain the division of labour upon which their privilege is based. In providing this summary there are many important historical events and trends that I give only cursory
attention to, and sometimes omit entirely, in order to keep this project manageable.\textsuperscript{2}

The logic of the chapter is captured in the following questions that oriented the search for relevant literature:

1. What role did managers, engineers, and other specialists play in organizational and labour process change and continuity through the 20th century?

2. In what ways has digital technology altered the work and working conditions of specialists and managers?

\textbf{Transformations}

\textbf{Emergence of the capitalist system.}

Contemporary, globalized capitalism can be traced back to tiny city trading enclaves in European feudalism. As much as it was a shift from an agrarian to a manufacturing base, and a struggle between the traditional aristocracy and a new merchant class, it was a process of knowledge capture, standardization, and control. Early industrial capitalists began in the 18\textsuperscript{th} century to integrate traditional artisan, guild and folk knowledge with new manufacturing technologies in sectors like textiles, then sought to break down complex mechanical operations into individual tasks which would increase efficiency and reduce the need for technically skilled labour. In many ways it was a relatively easy process recruiting generalized labour as individuals and families streamed into the cities as jobs in rural and agricultural settings disappeared. The primary struggles, anticipating later broader struggles, tended to be local, pitting capitalists against artisans and craft guilds whose

\textsuperscript{2} To name just a few, I largely omit: developments within communist and socialist political parties in Canada and abroad, the civil rights movement, successive waves of feminist thought and action, the emergence of identity politics and postmodernism, the New Left and its relationship with “middle” class activists and students, and the breakdown of the USSR and other communist or “state-socialist” countries.
traditional social and economic power was eroding (Braverman, 1974; Cortada, 1998).

These groups had fiercely restricted access to knowledge, giving them great power and prestige prior to industrialization. As industrialization grew, this knowledge-control allowed artisans and craft guilds to retain some control in relation to both owners and other employees. However, this struggle to retain control over one’s work, and to perform a job from beginning to end, was largely a losing battle for craft workers. With the introduction of more advanced machine technology to manufacturing through the late 18\textsuperscript{th} and 19\textsuperscript{th} centuries, the roles and need for skilled labour were radically altered and the dichotomy between intellectual and manual labour became more entrenched (Sohn-Rethel, 1978). The cadence and design of work frequently shifted from the worker to the machine for any labour that could be brought into a factory setting, with management and supervisors taking more and more coordinating and disciplinary responsibility for the production process. A problem remained, however: industrialists lacked a critical mass of labourers. With the enclosure of farm lands and expulsion of farmers and their families (Mandel, 1990) in the middle of the 19\textsuperscript{th} century, however, more and more workers were drawn from agricultural work to the cities and jobs in cotton factories and other fledgling manufacturing industries. Factories bellowed clouds of waste, safety regulations were lax if existing at all, children often laboured long days in dark and dangerous workplace, workers’ efforts to organize were often met with violent opposition, and clear distinctions formed among capitalists, small-
business owners, the self-employed, and the mass of mostly poor labourers (Berlanstein, 1992).

James Beniger (1986) argues that contemporary practices and structures in knowledge-based economies are the result of incremental developments in the late nineteenth century that cumulatively have ushered in a “Control Revolution.” With roots in the state-building and mercantile activities of the 15th, 16th, and 17th centuries, this revolution manifested itself first as public and private organizations sought to plan and execute detailed strategic and operational plans over great distance. Railways and telephony, postal organizations, and companies needing to reach larger markets demanded greater information regarding competitors, business processes, and employees. Some of this information processing and communication could be achieved via technological advances, but innovations also included a range of social (or socio-technical) nature. These innovations largely involved the application of scientific study and managerial theory to the performance and administration of work.

Capitalists and governments in the late 19th and early 20th centuries coveted greater productivity in factories, more efficient transportation and shipping systems, more massive projects like hydroelectric dams, more deadly weaponry, and so on. They thus came to depend heavily on those with engineering knowledge who carried out the projects, who presented incremental and radical innovations, and who developed and maintained the electrical system that made sure the lights stayed on and the factories and offices could operate later. The application of rational principles would deeply impact both the performance of work—through
rational approaches like scientific management—and the coordination and administration of work—through the expansion of bureaucratic, multidivisional organizations. Central to both of these phenomena were advances in information technology (IT), including the integration of IT with factory work and with office work. These factors both provided the foundation for the globalization of markets and intensified the process once begun, and in turn created growing demand for managerial, professional, semi-professional, and technical employees. Central to the search for productivity and growth were specialists who could engineer machines and who could plan and coordinate complex work.

**Engineering in historical perspective.**

Engineering as a distinct, sizeable occupational group emerged with the second, technical wave of the Industrial Revolution that occurred during the 19th and early 20th centuries (Chandler, 1977). This early explosion in the application of new scientific knowledge to technical problems was often carried out by a single person or a small group, and this individual or group of individuals would often not have defined themselves as “engineers” per se; engineering was one of their pursuits and many researched and applied knowledge from other fields of knowledge, whether it be philosophy, education, or politics (Rae & Volti, 1993).

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3 The origin of engineering is ancient; frequently it is associated with the building and designing military-related mechanical devices, but “civil” engineering—often portrayed as subsequent to military engineering, is readily visible in advanced masons’ work, large scale private and public ventures (e.g., Roman viaducts), and all sorts of small and large innovations. Early engineering knowledge was gained either through trial and error or through secretive apprenticeship, or a combination of the two (Rae & Volti, 1993).

4 Notable innovations impacting war, the office, the home, and the hospital include the locomotive, typewriter, agricultural equipment like the mechanical reaper, the propeller, the telegraph, the washing machine, the machine gun, the internal combustion engine, the plane, etc.
Despite the lionization of engineers like Edison, the decline of the lone inventor was already in motion during the 19th century.\textsuperscript{5} Associations of engineers began to appear in Western nations by the middle of the 1800s: the Canadian Society of Civil Engineers (CSCE) was established relatively late, in 1887, before becoming the Engineering Institute of Canada in 1918. The CSCE of course was predated by several hundred years by military and “royal” engineers who built fortifications, canals, water supply systems and, perhaps most famously in the mythology of Canada, the railways. By the early 20th century the “engineer” had become a recognized occupation in Canada, the United States and other Western nations, and had begun down the road of professionalization, though with mixed success in effecting occupational closure across various jurisdictions.

**Professionals and professionalism.**

The growth and formalization of engineering reflected a trend toward professionalization across a range of human occupations. The definition of a professional usually includes more than just the possession and application of a specialized body of knowledge gained through extensive formal education and often a specific vocational training period. A professional, in the traditional and full sense, is part of an association that is self-regulating and controls access to the occupation.

\textsuperscript{5} Edison’s story has been integrated deeply into American folklore as another of the obsessed inventors who, after years of intense effort, trials and failures, triumphs and achieves personal glory. Yet in the story of his “invention factory” at Menlo Park (Pool, 1997) there is a paradoxical trend in the performance and understanding of engineering work. With its staff of scientists, metalworkers, glassblowers, and others who helped churn out innovations at an unprecedented rate, Menlo Park is an example of the beginning of the “socialization” of engineering work that would transform the practice of engineering into the regulated occupation of “engineer.”
Frequently, the professional body also dictates or has substantial input on preparatory curriculum, and “closure” is effect through legislation and some sort of certificate or designation. Self-regulation usually entails a code of conduct (with commitments to protecting the public), disciplinary mechanisms, and the promotion of the profession through scholarly and/or trade journals, conferences, public relations campaigns, and research and planning (Evetts, 2006; Livingstone & Antonelli, 2010). Doctors and lawyers are the most recognizable of a full or “established” profession. The content of professionals’ work tends to engage them in “dealing with risk, with risk assessment and, through the use of expert knowledge, enabling customers and clients to deal with uncertainty” (Evetts, 2006, p. 135).

Many contemporary “professions” in the fields of birth and death, health, dispute resolution, financial activity, education, security, arts and media, religion, and the built environment were in nascent form at the beginning of the 20th century. Randall Collins (1979), in his study of credentialism, provides a detailed account of the struggle over and strategies for occupational closure with regards to doctors, lawyers and engineers, with the latter group not fulfilling the “professional project” to the same degree as the others. Collins focuses on the U.S. and, while the engineering profession in Canada followed a similar trajectory, the profession here enjoys somewhat greater regulatory strength and trans-provincial continuity. Despite the existence of the CSCE, provincial engineering acts6 formally outlining

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6 The Constitution Act of 1867 placed legislative responsibility for professional designations under provincial and territorial jurisdiction.
professional status and right-to-practice criteria would not begin to appear until the 1920s. The lack of regulatory frameworks did not inhibit growing specialization (e.g., electrical engineers) or the rising informal centrality of engineers in profit seeking ventures. They were fundamental to capitalist production in the performance of two, deeply intertwined activities: a) research and design (R&D) and b) the coordination, monitoring and redesign of the labour process. Some engineers performed both activities, but intensive R&D was increasingly separated from more day-to-day, practical engineering work (Ball, 1987). What had not been the focus of most engineers was the integration of humans and machines into complex processes of production. This changed with the emergence of “scientific management.”

Scientific management.

While numerous efforts were ongoing at the beginning of the 20th century to improve productivity in factories, by far the most well-known and most influential was Frederick Winslow Taylor's effort to fuse engineering and managerial theory in “scientific management.” From a well-to-do family, and having left Harvard because of his failing eyesight (Maley, 2004), Taylor became an apprentice engineer and began conducting the time and motion studies that would, without exaggeration, revolutionize industrial productivity. These studies of work flow, where “hundreds of discrete movements were brought into a rigorously consistent process by design departments and industrial engineers” (Maley, 2004, p. 78), were only one part of a broader set of principles that focused on work analysis, selecting workers appropriate to a specific job, training, and close monitoring (P. H. Sawchuk, 2010).
In contrast to simplistic caricatures of Taylor, which reduce his work to a
crude separation of planning from performance (or conception from execution),
Sawchuk (2010) explains that Taylor incorporated a variety of (then) contemporary
management theories, including incentives like promotion, shorter work hours,
better human relations, and even elements of trust and commitment. Scientific
management can best be understood as an amalgam of Taylor’s: 1) ideological
commitment to market competition; 2) a fixation on maximizing efficiency in the
face of worker resistance; and 3) a realization that workers’ knowledge could and
needed to be studied carefully in order to maximize both efficiency and
management’s negotiating power. In many ways, Taylor was advanced (and
unrecognized) in his orientation to practical, tacit knowledge of workers, and their
capacity to improve upon systematized and standardized practices.

In occupational terms, Taylorism formalized the historic trend of dividing
organizational planning and technical decisions, on the one hand, from the
performance of tasks, on the other. This division of labour, further formalized in the
creation of engineering associations and legislation, created the conditions for a
relatively rigid division of labour within industrial manufacturing. This division of
labour, and application of rationalist ideas to production, led to highly routinized
factories where products moved along assembly lines. Famous is Henry Ford’s auto

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7 Taylor’s fixation on efficiency was not nefarious, it should be noted; rather, it reflected Technocratic
beliefs common at the turn of the century that proposed the application of scientific methods and the
automation of routine work would reduce labour conflict in the pursuit of a rationalist utopia (Maley,
2004).
factories around the Detroit region in the early part of the century. But the division of labour occurring in factories was paralleled by a different sort of division that had long manifested itself in state bureaucracies and was beginning to be adopted in white-collar, capitalist organizations, and within occupations involved in the planning and design of work and administration.

Complex organizations, specialists and the “managerial revolution.”

The small- and medium-sized businesses, frequently run by a single person or family, which had dominated capitalism up until the 20th century rapidly began to give way to modern corporations. Corresponding with this emergence of “managerial capitalism,” where ownership was supposedly being separated from control over organizational decisions, ownership was increasingly taking the form of stockholdings, either individually or, later, via pension fund. Senior managers controlling large corporations were rarely financially invested in the firm and even if they were almost never had a majority stake (Berle & Means, 1932; Burnham, 1941). Chandler (1980), in what he labels the “managerial revolution”, describes how corporations began to evolve into collections of discrete business units, and by the middle of the 20th century the modern business enterprise had evolved into a

8 So successful and influential were these auto production lines, patterned after the pig-slaughtering “disassembly” lines in Chicago (D'Eramo, 2003), that even today the routinized approach to production and service delivery (e.g., managerial oversight and low skill workers) are referred to as “Fordist” (Kumar, 1995). The precision of scientific management also permeates many supposed “post-Fordist” organizational strategies.

9 As Berle and Means’ (1932) well-known study points out, this transformation brought about a change in the relationship between ownership and decision-making: the “two attributes of ownership—risking collective wealth in profit-seeking enterprise and ultimate management of responsibility for that enterprise—had become divorced” (p. vii).
complex hierarchy of middle and top managers controlling their production units under the general direction of executives. Managers, notes Chandler, began to acquire formal and informal specialized knowledge, often with the same or similar training as traditional professional occupations. This tendency towards managerial intensification and the centralization of knowledge was also apparent in the service-based organizations that came to dominate economically and occupationally after World War II; here, however, the informational and personal-service nature of work—as opposed to physical labour—demanded different skills and called for not only different managerial techniques but also a new sort of "organizational" employee to support the coordination and administration necessary to ensure various divisions and locations operated in concert.

These new employees included large numbers of clerical staff (often women) but also growing numbers of “specialists” roles (professionals, semi-professionals and technical workers) to: provide organizational and business sector information; ensure the organization operates efficiently via surveillance and the development of documented norms and routines; and research, develop, and distribute new physical or service-based commodities (see Beniger, 1986; Cortada, 1998; Schement & Curtis, 1995). A rough estimation of such occupations suggests that “knowledge-producing” grew from approximately 10 percent of the labour force in 1900 to over 30 percent in 1959 (Machlup, 1962). While bureaucratic rules and norms

10 It should be noted that Machlup takes an inclusive if problematic approach to the study of the trend towards knowledge producing occupations, claiming “all information is knowledge” (p. 8). For Machlup,
certainty constrained white-collar work, and white-collar workplace culture could be highly conservative in its orientation to conformity (Mills, 1951), professional and specialist employees were relatively privileged compared to most workers, largely untouched by the automation, outsourcing, and beginnings of offshoring that had begun to shrink and weaken manufacturing employees and their unions. In addition, growing numbers of financial, marketing, telecommunications, research and other service-oriented companies required professional and technical employees whose work could not so easily be monitored nor prescribed. This inability to “manage” (i.e., increase the productivity of) has been at the heart of much theorizing and research on white-collar “knowledge workers” (e.g., Drucker, 1993). The work of specialized “mental” labour frequently focused on rationalizing the work of others, but they themselves demanded different sorts of managerial strategies.

Strategies to bind these types of specialized workers, as well as managers, to a given organization, without limiting their discretionary activities, have included

knowledge production includes discovering, inventing, designing, planning, disseminating and communicating. He concludes the increase in ratio of knowledge producing labor to physical labor is strongly associated with the increase in production and the rate of economic growth, leading to a gradual but distinct shift in occupational composition from so called “productive” labor to “knowledge-producing” workers. Among knowledge producing occupations, Machlup identifies any transporters, transformers, processors, interpreters, analyzers, and original creators of communications of all sorts. In an odd twist, Machlup disqualifies from the knowledge economy those workers who only “use” knowledge. No matter how knowledgeable, a person is excluded from his “knowledge worker” category if their product is not a communication-oriented activity or a service contributing to knowledge-transmission. Thus, 50 percent of doctors and surgeons are excluded from the category of “knowledge production” as they “apply” but don’t transmit knowledge.

11 While some service occupations, like data-entry jobs, could more easily be routinized and their input and output tracked, management was largely inhibited in its ability to capture key knowledge and ensure scientific, technical and/or professional employees were applying their knowledge in the most efficient and profitable way.
various combinations of incentives, delegated authority, and greater peer- and self-management (Meiksins & Whalley, 2001). Whereas the traditional professional was frequently self-employed, or an employer in a small practice (again, the archetypes are lawyers and doctors), a new form of “organizational professional” (Evetts, 2003) was clearly emerging by the middle of the 20th century

**Post-World War II economic and occupational trends.**

Engineers and other technical specialists had been at the heart of the military effort during World War II (WWII), working under intense pressure to develop theoretical and practical advances in information technology that gave the Allies the advantage in espionage and counter-espionage, and in weapon development (Pool, 1997). The welfare state expanded substantially as governments at the provincial and federal level increased their collection of research, breadth of services and supports, and operated various agencies and crown corporations. Organized labour in the manufacturing and extractive industries secured (relatively) generous wages and job security, though largely giving up attempts to gain individual or collective

12 These include: 1) recruitment mechanisms to identify those who are willing to apply their skills; 2) strategies that allow for autonomy but also unobtrusive control (e.g., interdependent work teams); 3) higher salaries and benefits that buy loyalty; 4) the use of time-demands (outcomes in place of procedures) to encourage a focus on corporate goals; and 5) internal career ladders that “select, motivate, and reward” (p. 236).

13 Engineers in both Germany and the United States were also, now (in)famously, racing to understand and then control nuclear fission. The Manhattan Project in the United States reached the goal first, the result the nuclear bombs dropped on Japan. Out of this success—if we can for a moment set aside the ethical issues of such an endeavor and call the invention and use of nuclear weapons a success—developed a broad confidence among engineers in their ability to use scientific knowledge to overcome any problem, and to control risks inherent with massively powerful and complex technologies. The achievements in WWII were part of and amplified the “technological progressivism” that has long characterized cultures in both America and Canada. This outlook, often tied to technologically deterministic outlooks on human development, and in combination with massively increased production capacity via Fordist manufacturing, ushered in an era of prosperity and consumption that stood in stark contrast to the want during the Great Depression.
input into how work was designed and/or performed (Aronowitz, 2004). At the same time that stability and affluence grew among industrial workers, the market for personal and business services continued expanding. While some “skilled” trades persisted in the extractive and manufacturing sectors, much factory work became highly routinized. Yet, as the logic of industrialization reduced the need for specialists in one area, the expansionary and competitive impulses of capitalists continued to create the conditions for growth in specialized labour oriented to a range of planning, research and administrative functions.

New administrative and professional jobs proliferated not only in type but in quantity as well.14 This shift in occupations was the catalyst for a broad range of theorizing about a dramatic shift toward postindustrial society dominated by the production of commodities and provision of services invested with ever more sophisticated theoretical knowledge. Participation in formal tertiary education spiked dramatically in the United States and Canada, reflecting the desire for mobility. It also reflected the ancient bias against manual labour (Veblen, 1934), the quasi-utopian promise of work in the office and a home in the suburbs, and continued credential inflation in the labour market (R. Collins, 1979). In the United States, attainment of a Bachelor of Arts (B.A.) or professional degree increased dramatically, more than doubling between 1940 and 1950 (seven percent to about

14 In the United States, between 1950 and 1960 the proportion of jobs that were professional and technical, managerial or government official, clerical, or sales increased from 37 percent to 42 percent. Manual and agricultural workers fell as a percentage of the workforce, while those in basic services grew slightly. Between 1958 and 1974 the total number of workers in “white-collar” jobs increased by over 50 percent, with the sub-category of professional and technical occupations increasing by over 75 percent (Bell, 1973, p. 134-135).
15 percent). At the same time, a major transformation in technology (and work) was unfolding: the personal computer emerged, bringing with it alterations in the way work was conducted, the process of production and service delivery, and the occupational structure.

**The computer revolution and work.**

While the 1950s, '60s, and early '70s witnessed an explosion in consumer technologies, advances in industrial machinery and automation, and significant innovations in information technology, the ongoing advances in computer technology was largely outside the collective popular imagination (and understanding). Computers, emerging out of military research in WWII, entered the business world in the 1950s, were huge, expensive and prone to breaking down. Early forms of the Internet were pioneered in the 1960s by advanced research teams within the American military. It was not until the invention of the microprocessor in 1971 and the subsequent development of personal computers by Xerox, Apple, IBM, and others that the impact of information technology IT on social, economic and political changes truly accelerated (Castells, 1989; Pool, 1997). The “computer revolution” gained its first big push from small groups of interest-driven users (mostly in the U.S., but also including some Canadians and Europeans) who saw incredible potential in the first computer kits and personal computers released in the 1970s. For many of them, the computer's transformative potential was massive, akin to the introduction of steam (the first wave of the Industrial Revolution) and electricity (the second). Unlike previous revolutions, however, the IT revolution they were initiating was not limited in its geographical reach; IT, due
to its relatively low cost and size, but mostly to its communicative capacity, was about to rapidly connect the world in unprecedented ways and, in the process, provide hot-burning fuel for techno-optimists. These early adopters called themselves “hackers.”

**Hacker culture.**

The term hacker as it is used currently has little connection to the original meaning. The only real connection is that both are heavy, knowledgeable users of computers. In contrast to the illegal activities and virus-creation associated with current hackers, the hacker of the 1970s can more usefully be connected to early engineering practice.¹⁵ In the early 1980s Steven Levy released a study on the early computer pioneers and the technological progressivist, highly innovative, and sometimes radical culture that had formed around the Altair, the Apple I and II, and IBM’s Personal Computer (PC).

Levy’s 1984 book, titled *Hackers: Heroes of the Computer Revolution* (1994), outlines a series of principles that Levy perceived as core to the movement, and form a “hacker ethic” around freedom of access and freedom of information.¹⁶ The

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¹⁵ Some hackers were academics in technical fields, some were engineers, but many were students or people in jobs not connected to computing who became obsessed with the possibilities inherent in the new unassembled kits like the Altair that could be tinkered with, and in learning and innovating with the early programming languages like BASIC. The “open architecture” and low-cost of the early, do-it-yourself personal computers allowed hobbyists to innovate and share ideas, out of which emerged numerous (and passionate) grassroots groups, many in California (Pool, 1999).

¹⁶ There were six components of the hacker ethic. First, access to computers should be unlimited and total, and not just computers but any information technology that might teach one something about the way the world works. This access needs to be “hands on” in order for learning to be maximized. Second, information of all sorts must be free. Third, promote decentralization in order to weaken authorities that cannot be trusted. Fourth, meritocracy should be privileged, where hackers should be judged by their hacking (craft-competence whether it involves hardware or software) and not “bogus” criteria such as
work of these early hackers rapidly pushed the boundaries of the effectiveness of computers and, especially, the usability, such that by the early 1980s personal computers and early, rudimentary networks were appearing in workplaces and increasing numbers of (affluent) homes all over North America and Europe. The hacker culture chronicled by Levy largely had two trajectories: one direction has been those who remained committed to sharing, freedom of access, and cooperation instead of competition, and out of which has emerged the “open source” movement; the other trajectory are those who saw a way to make money through the promotion of digital technology, most recognizable Steve Wozniak and Steve Jobs of Apple and Bill Gates of Microsoft (see Levy, 2010).

The communities created by hackers, the spirit of innovation fostered within those communities, the companies that they created, and the digital technologies that were marketed set the stage for a process that is similar in some ways to the “socialization” of engineering labour in the late 19th and early 20th centuries. The experimentation and collective application of knowledge that was so much a part of hacking culture would be transformed and enveloped by organizations and frequently bureaucratic managerial systems. Out of this integrative process would emerge new occupations like systems analyst, database administrator, programmer, and a growing number of technical roles associated with IT security, networks, business and IT integration, and, more recently, web design. But computers and

degrees, age, race or position. Fifth, a computer is fully capable of being the medium for the creation and display of art and beauty. Finally, involvement with computers can change lives for the better.
related digital technology would also become a foundation for alterations in the internal structure and geographical distribution of organizations and labour processes, and may ultimately pose a threat to the very knowledge-intensive occupations that emerged around such technology.

**The Knowledge-based Economy**

There is fairly wide-spread agreement among mainstream and critical researchers that, within production, distribution, and service-delivery, flexibility and rapid-response are increasingly the norm, and organizations are growing more complex and, in the case of private firms, inter- or transnational (Kalleberg, 2003; Lehndorff & Voss-Dahm, 2005; Smith, 1997). The present-day labour processes in both industrial- and service-sector workplaces have become increasingly mediated by and dependent upon sophisticated technologies, oriented around the management of vast quantities of information, and connected via global communication networks (Castells, 1996). Scientific and technical knowledge has escalated in importance for firms competing in an economy that is connected globally by advanced transportation and production networks and coordinated via sophisticated information and communication technologies (ICTs). This imperative for new knowledge applies as much to companies manufacturing goods as it does to firms in the rapidly growing business- and personal-services sectors. The importance of knowledge and new technology is no less important in the public sector as governments seek greater efficiency in areas like the collection and analysis of information, health care, and program administration. These trends and others are commonly bound together as evidence of a shift away from
manufacturing and simple jobs and toward a knowledge-based economy and highly skilled jobs.

The concept of the knowledge-based economy (KBE) is a new if largely abbreviated version of older, more holistic postindustrial theses proposing a transition away from the bureaucracy, routinization and monotony of the industrial era. Under the umbrella of post-industrialism were and are important sociological debates around the social impact and bias of new technologies, shifts in cultural practices and norms as Western societies shifted towards service work and consumption, and the political nature of scientific practices and ideas (see Kumar, 1995). The concept of the KBE and most of the related concepts identified above tend not to incorporate these broad political economic and sociological debates. Resonating with policy-makers, business analysts, and business-oriented and human resource post-secondary programs, the idea that Western, developed economies are now knowledge-based tends to be a tightly defined concept grounded in classical economic concerns with markets, comparative advantage, and human capital.

17 The notion of a shift to a post-industrial society (e.g., Bell, 1973) is largely connected to changes in Western nations in: what commodities are produced (a shift to knowledge-intensive services and high-technology goods); how these knowledge-intensive commodities are produced (in teams and through IT); the globalization of markets for such commodities; and the types of and location of workers whose labour is central to the production of knowledge-intensive commodities (Western nations like Canada). Besides the “post-industrial” label, and the more recent “creative economy” proposed by Florida (2002), this new capitalism has been described as the “new economy” (Jones, 2003), the “weightless economy” (Quah, 1999), the “information economy” (Porat, 1977), the “knowledge” or “knowledge-based” economy (Desmond Beckstead & Vinodrai, 2003; OECD, 1996). Each label has its proponents, but in the main they all draw on the same sort of data: growth in patents; research and development; growing uncertainty and competition; more complex and “skill-biased” technology; the growing formal educational attainment of the workforce; and the growth in professional and semi-professional occupations (whom I call “specialists”).
A series of ongoing, largely economistic debates exist relating to how best to define the knowledge-based economy or which variables are most appropriate for measuring its extent or dynamism (Brint, 2001). The preoccupation in such efforts tends to be on “knowledge-intensive” economic activity and on high-tech industries (Desmond Beckstead & Gellatly, 2004), and variation by geographic region, country, industry, sector, product, and organizational type. Canada’s economic growth in the latter half of the 20th century can be linked directly to our proximity and close ties to the United States, the reigning global hegemon despite its current financial woes and the growing influence of China, the European Union, and other growing economies. The corporatism of the latter third of the 20th century—with its coordination of interests among government, business and labour that resulted in protected domestic markets, labour stability and continuously rising wages—has given way to a global trading regime that is much more chaotic, fast-paced and competitive than anything that has preceded it.

Western manufacturers of computer hardware, planes, medical tools, and even toys have, in most advanced economies, seen the breakdown of protectionist measures and a flood of products from countries like China with cheap labour, an

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18 The emergence of global markets for goods, services and labour has largely been a boon for corporations and large business owners in advanced capitalist nations like Canada. It should be stated that it has also been a boon for some workers. Many Western nations have enjoyed a massive head start in corporate development, economic and academic integration into the international scientific community, legislative stability and rule of law, and ready access to relatively highly educated workers.

19 This head start is intimately linked to our historical relationship to Britain, one of the world’s great empires whose colonial activity along with other nations like Denmark, Portugal and France, shaped the current asymmetry between the “global north” and the “global south.”

20 The Free Trade Agreement with the United States (US), implemented in the 1980s, and the current North American Free Trade Agreement (NAFTA) with the US and Mexico have been part of the larger neoliberal restructuring of global trade relations.
aggressive trading policy and enticements for commodity manufacturers to relocate. In many cases, to remain competitive Western companies have moved operations overseas and managed production and distribution from hubs like New York, London and Toronto (Castells, 2000). Business and personal services, accounting for more than two-thirds of the gross domestic product (GDP) among OECD countries (Wolf, 2010), are also facing immense pressure from global competitors. Such firms must conceptualize, research, develop, test, advertise, and finally market their service and/or service-based product in less time and to a greater consumer base in order to remain profitable. Firms struggle to distinguish themselves against companies targeting niche markets and transnational giants whose economies of scale make direct competition difficult.21

**Skill-Biased Technology**

Similar to the restructuring of the labour process around machinery that took place during the Industrial Revolution, which provided owners with greater control and thus increased productivity, organizations in the KBE have been striving to introduce labour-saving technologies. The development and introduction of the computer, while slow to begin with, has more recently been rapidly adopted within

21 Despite the competition and a recent recession, business and professional services in Canada have generally thrived (Foreign Affairs and International Trade Canada, 2010). Some of this success is the result of favorable conditions and relative maturity of Canada’s economy, some of this success has been related to the federal and provincial governments’ increasing emphasis on “knowledge-intensive” industries. Canada may not yet be the “magnet economy” (P. Brown & Lauder, 2006) its policy makers and their advisors desire it to be—drawing high-tech companies, and high-skill, high-pay jobs as professed by recent federal governments (Department of Finance Canada, 2006)— but it is fairly clear that Canada is an advantaged nation within the global, knowledge-based, “network economy” (Castells, 2000), possessing robust reserves of natural resources, a strong market position in agriculture, and a highly educated workforce.
productive and distributional processes, encouraging automation and breaking
down the boundaries of space and time with regards to information processing and
communication. Canadians Massé, Roy, and Gingras (1999) present a fairly well-
trod argument that the result of the introduction of new information and
communication technology can have a “substitution effect” (p. 21).\textsuperscript{22} Massé, Roy,
and Gingras (1999) present Canadian Census data that suggests the substitution
effect of technology has been a powerful factor in the compositional change in this
country’s occupational structure, explaining for them the expansion of “knowledge”
and “management” occupations. Massé, Roy, and Gingras do note that
computerization, while a major part of this compositional shift, has had a mixed
impact across the occupational spectrum. Where the core activity of a job depends
on tacit, non-codifiable knowledge, there is a hugely reduced chance of computer
substitution. This is a familiar theme; while such claims are gross simplifications of
non-specialist work, like that performed by clerical staff, and deny the often tacit
“working knowledge” (D. Collins, 1998) necessary to perform just about any job,
there can be little denial that computerization has been used to automate many jobs
and make others—like clerical—increasingly unnecessary as workers manage their

\textsuperscript{22} This means that information-intensive tools, particularly the computer, favour certain types of workers
(i.e., specialists) at the expense of other types of workers, usually those not working in jobs demanding
specialized general or specific knowledge. Among “information workers,” those who primarily transmit
and manipulate basic data (e.g., clerical workers and many junior technical staff) in more routinized labour
processes are therefore more prone to automation. In contrast, those who produce, manipulate and/or apply
techno-scientific knowledge (e.g., engineers, IT workers, scientists, and economists) engage in creative
activities that do not lend themselves to automation or simplification.
Knowledge-Intensive Activity.

Clearly, not all knowledge in the “knowledge” based economy is equal. In the context of bureaucratic efficiency and markets, that which can add value, improve productivity, gain market share, and/or increase revenue is focused on.\(^{23}\) Much of the knowledge sought through R&D and protected via patents is of a formal, codified nature: scientific and technical knowledge relating to designs like company logos, software, toys, pills, hybrid cars, waste management techniques, and so on. It is explicit knowledge relating to a final product. There also exist immeasurable amounts of procedural, functional, social knowledge that cannot be codified into a patent, a trademark, or an algorithm, and are difficult to formalize or centralize.\(^{24}\) In some ways, the competitive pressures in the globalizing economy are making this type of knowledge far more important than in the past. Mounting evidence (Alvesson, 2004; Kelloway & Barling, 2000; OECD, 1996) suggests that, in a variety of sectors and among a wide range of occupations, the need to “get things done” at a rapid pace demands more than ever that employees pool their knowledge, have ready access to information and expertise, and understand the context of their actions within the organization as a whole.

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\(^{23}\) At one time, only knowledge that could be protected (i.e., privatized) was of interest for private companies but this is changing as more and more companies, though still a very tiny percentage, earn money by providing services around open-source software.

\(^{24}\) As well, e-commerce and what might be called “lifestyle” websites have intensified the demand for cultural knowledge and experiential insights into various mass and subcultural interests and perspectives that can be quickly commodified into a website. Think here of the so-called “trend-hunters” employed and contracted by corporations searching the globe for the next “in” thing or “it” subculture.
Business spending on and government initiatives emphasizing research and development (R&D) rose markedly among OECD countries (1996) through the last decades of the 20th century, and remained strong despite cycles of boom and bust (OECD, 2009). Occurring alongside general increases in R&D spending has been an explosion in the privatization of knowledge via patents.25 At the centre of patenting efforts are specialists like engineers, IT workers, and scientists in fields like botany, geology, and physics. Increasingly the patent process in the U.S. and other Western nations is dominated by lawyers as litigation over patent infringement, driven partly by what some call “patent trolls,” expands exponentially (Bessen & Meurer, 2005; Chien, 2011).

**Occupational Composition in the Knowledge-Based Economy**

Service-sector employment has grown significantly and rather expectedly in most advanced capitalist economies (Baldoz, Koeber, & Kraft, 2001; John R Baldwin & Beckstead, 2003; Castells, 2000; Frenkel, Korczynski, Shire, & Tam, 1999). The introduction of robotic and informational technology has reduced the need for human labour in manufacturing, and many of the remaining industrial jobs have been transferred to low-wage nations and zones. Besides a shift in composition towards the service sector, growth rates have been higher there, too. Sectors like

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25 In the United States between 1981 and 2001 the number of total patents granted more than doubled to approximately 170,000 per year (Powell & Snellman, 2004: 203). The OECD continues to produce reports on the KBE documenting the rising spending on innovation and patents. These R&D practices are, expectedly, most prevalent within “high-tech” sectors like aerospace, pharmaceuticals, and computers, with Canadian businesses and research organizations (including universities) particularly active in the area of biotechnology (OECD, 2009). Interestingly, R&D is just as often outsourced to public and private research companies as kept in-house.
accommodation and food services, wholesale and retail trade, business, building and other support services grew and then began declining after 2005. As predicted by Bell (1976), in other service sectors (e.g., health, education, finance) front-line and backroom demand for professionals, semi-professionals and technical occupations has increased steadily and more rapidly (Human Resources and Skills Development Canada, 2011).

**Occupational Change in Canada**

Growth of specialist occupations, initially in the public sector with the growth of the “welfare state” in the middle of the 20th century, has accelerated in the private sector. Civil servants in public administration, education, health, etc., fell as a proportion of the labour force during the 1990s (Derlien & Peters, 2008) to around 20% as of early 2010 (Statistics Canada, 2010). Public sector specialists have not, however, dropped in absolute numbers (Statistics Canada, 2010) despite the neoliberal dismantling of the government services and programs in Canada, including reductions in unemployment insurance and social assistance (Burke, Mooers, & Shields, 2000; McBride & Shields, 1997; Pulkingham & Ternowetsky, 2006).26

Canadian data indicates that the share of specialist occupations (occupations demanding advanced credentials) has been increasing, though not as fast as KBE rhetoric would suggest. Grouping jobs *a priori* by occupational code, a study by the

26 This may change in 2013 and beyond as the federal government attempts to shed tens of thousands of public sector jobs.
then-named Human Resources Development Canada (Lavoie & Roy, 1998) found that, as of 1996, under ten percent of the workforce was made up of “knowledge workers” (defined as non-managerial workers in the pure sciences, applied sciences, engineering, computer science, and the social sciences and humanities). Meanwhile, data-related work dominated the job market at around a third of the labour force; less than a third of workers still manufacture goods; and less than twenty percent worked in services outside the elite knowledge worker categories. The fastest growing group between 1971 and 1996 was managers in the field of science and technology, at around ten percent per year, with only computer programmers/analysts and “other” managers close. Job growth in the more traditional knowledge-based professions such as accounting, investment and education, at less than five percent per annum, grew slightly faster than jobs in the pure sciences, applied science, and engineering. This growth was only slightly ahead of growth in data-entry and manipulation jobs (around two percent) and human-services occupations (around three percent).

Linked studies by researchers associated with Statistics Canada (John R Baldwin & Beckstead, 2003; Desmond Beckstead & Vinodrai, 2003) construct an occupational skill taxonomy that begins first by operationalizing “knowledge-based occupations” by category: education; social sciences; medicine and health; law and jurisprudence, writing; natural sciences, engineering and mathematics; and managers and administrators. These studies, using a broader definition of knowledge worker that includes managers in addition to professional and technical occupations, found that “professional” occupations are the largest and fastest
growing among knowledge workers, yet made up less than fifteen percent of the labour market as of 2001. Specialists (what Baldwin and Beckstead call knowledge workers) as a group still account for less than a quarter of the workforce. Between 1971 and 2001, growth in the percentage of knowledge workers was fastest within market services, rising to just over fifteen percent of all market service occupations. Among non-market services such as government, education, health and social services, the growth rate was low but knowledge-based jobs in this sector remained stable at around forty-five percent.

**The Knowledge Premium**

Canada and the U.S. have long had the highest post-secondary attainment levels world-wide, though other developed nations have in the last few decades narrowed the gap (Livingstone, 2004). By the latter decades of the twentieth century, the percentage of young adults with a university or professional degree in the United States was over one-fifth, with Canada very similar (R. Collins, 1979, p. 4, 119; Livingstone, 2004, p. 16). Educational attainment continues to be at the core of “human capital” theorizing, a field of study that has mainly linked education credentials with skill requirements in a direct manner. The emphasis within human capital theory is on the individual investing in building personal, portable capital, and economic returns on this investment.²⁷ The human capital approach has

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²⁷ This “capital” involves building the necessary knowledge-base and specific skills that will allow an individual to advance their career by being (supposedly) more productive, thereby fulfilling the need (“demand”) of employers for scarce knowledge and capabilities. The personal “investment” in oneself pays off via the ability to demand a “rent” from the employer that will not only result in a higher wage compared
fostered a large body of sophisticated statistical research on returns on educational investment for workers, which for many researchers is proof that workers’ human capital is important and used by the employer: otherwise, why would the employer pay? One of the key pieces of evidence for those claiming positive outcomes for workers in the KBE in the U.S. is the rising rate of return on education in that country. In Canada, the ratio did not change much, though the “education premium” is large (Zhao, Drew, & Murray, 2000). Burbidge, Magee and Robb (2002) study various explanations and find that supply-demand dynamics explain little and that the cause is more likely linked to employment protection measures and higher unionization in Canada, though further research is needed. More recently, research in Canada and the U.S. has focused on age and sex as determinants of education-wage ratios.

Morissette, Ostrovsky and Picot (2004), using Canadian census data, confirm the Burbidge et al. finding of little change in the education-wage ratio in Canada. Directly relevant to this project, their main finding is that, although employment growth rates were larger in high-knowledge industries than other sectors over 1980s and 1990s, the relative wages and real wages of university and high school graduates remained surprisingly consistent across industries.28 Such findings to other workers but will allow the employee to recover the initial investment in education (Benjamin, Gunderson, Lemieux, & Riddell, 2007; see also Sørensen, 2000a).

28 As Morissette, Ostrovsky and Picot emphasize, “the acceleration of employment growth in high-knowledge industries has not been accompanied by an acceleration of real and relative wages of university graduates in this sector (relative to other sectors)” (p. 23). In Canada, at least, the aggregate finding of no change in education-wage ratios masks differences based on age and sex, with younger and “prime-aged” female university graduates experiencing faster wage growth than equivalent male categories.
suggest that while those with advanced educational credentials are paid more they are not able to translate their knowledge into greater power and wage growth relative to less knowledgeable workers. While this thesis does not define class in terms of wage, or pursue this issue of wages in any great detail, such findings are important for problematizing the labour market theories used to make claims of a knowledge economy.

**Organizational Responses**

In exploring the (claimed) nexus between human capital (as skills inhering within a worker) and power within the social relations of production, it is worth differentiating between general human capital that is transferable and human capital that is specific to an occupation or organization. This separation of specific and general human capital has led to research on which type workers should pursue, which type employers should orient their training to, which sectors and industries value which type, and so on (Gathmann & Schönberg, 2006). Individuals and organizations continue to “invest” in human capital for the “strategic” advantage it brings to both (Zack, Smith, & Slusher, 1999).29 The notion that has come to dominate much business theory (if not practice) is that organizations must alter their structures, cultures, and affinity for bureaucratic rules and principles. Out of the variety of concrete responses, probably the most dominant and familiar is

29 According to Zack, Smith and Slusher, strategic knowledge is made up of six qualities: it must be rare or *unique* to improve competitive advantage; it must be *exploitable* within the organizational; it must be *valuable* in a market context; it must be *defensible* (not easily imitated or substituted); it must be *dynamic* (adaptable to changing needs); and it must be evaluated for the *learning* costs required to maintain the previous qualities.
“knowledge management” (KM), an approach that involves “the identification and analysis of available and required knowledge, and the subsequent planning and control of actions to develop knowledge assets so as to fulfill organizational objectives” (Seonghee Kim, 2000, p. 3). KM involves both accounting innovations relating to “intangible assets” (Guthrie & Petty, 2000, p. 158) and to building “human capital” within organization via employer-sponsored learning and the fostering of a desire for “lifelong” learning among their employees (OECD, 1996). This has resulted in a flood of books and articles (and university courses) around knowledge management (Klein, 1998), calls for learning organizations (Senge, 1994), and a general push to recognize the nature and value of knowledge in both its explicit and tacit forms (Kelley, 1985; Stewart, 1997).

Conclusion

In this chapter I have attempted to give equal weight to the evolutionary and revolutionary changes that fuel debates around postindustrialism and the “knowledge-based economy” (KBE). The occupational structure in advanced capitalist countries like Canada change relatively quickly, driven largely by the application of scientific discovery to commodity production and the expansion of rational managerial approaches in both manufacturing and services. I emphasized the rise of professionals, generally, and engineers and information technology workers, specifically. In the growth of specialist occupations we see first the emergence of classic professionals and later the growth of “organizational” professionals. For both, however, core activities have centred on occupational closure and control over a given body of specialized knowledge. Success has been
mixed in achieving full professionalization, and some occupations like IT workers have so far been both unable and largely unwilling to pursue greater closure. Organizational theory and evidence on income-related “education premiums” propose that specialized knowledge and those who wield it are so important to organizational success that closure is unnecessary. The optimistic knowledge class theories presented in the next chapter take such proposals, in combination with the rise in specialist labour, and draw sweeping conclusions about changes in the social relations of production and, consequently, the class structure. Others are not convinced.
Chapter Two – (New) Class Analysis

Introduction

In this chapter I begin by reviewing the Marxist and Weberian approaches that have dominated class analysis for at least the last half-century, the importance of distinguishing between gradational and relational approaches to class, and critiques that seek to either modify or quell class analysis. I then return to Marx and Weber seeking out how each approached specialized and managerial labour, and identifying the parts of their broader theories of socio-economic change that animate the new class debate. In charting this new class debate, I seek to emphasize the continuity in theoretical “camps” over the last century or so. While highlighting the differences between the camps’ theoretical orientation and class maps, I also note the shared focus on work and the division of labour as the fundamental unit of analysis for understanding class locations in specific societies. That is, according to most new class theories it’s what specialists and managers “do” in the labour process and the power that comes from their activity that decides their class affiliation.

The Study of Class

The idea of social class has long been both one of the central and most contentious concepts in sociology. There are two primary divisions in the study of class worth noting at the outset. One source of tension if not direct antagonism exists between those advocating a gradational approach and those advocating a relational approach. Along a separate axis is conflict between those advocating that
class can be studied irrespective of class struggle (the “objective” approach) and those advocating that classes only exist and matter where class struggle and consciousness are apparent (the “realist” approach).

Those pursuing gradational theories of class often use income, status or prestige scales, and/or education to aggregate individuals and tend to be less oriented to overarching theoretical frameworks. This tradition has invested heavily in developing scales of socio-economic stratification based around education, status and prestige (Langlois, 2002; Milner, 1999). In Canada, two notable examples of socio-economic status measures include the Pineo-Porter prestige scale (Pineo, Porter, & McRoberts, 1977) and the Blishen scale (Blishen, Carroll, & Moore, 1987). One of these gradational approaches, based around income, tends to dominate populist discussion in the media; a current example is the various claims of an elite-led “war on the middle class” in the United States (e.g., Dobbs, 2006).

Relational approaches also aggregate but focus instead on how the actions, practices and interests of one class impact on the working and living conditions of other classes. Critical class analysis after World War II, including the debate over the class position of professionals and other specialists, has primarily been shaped and organized around the Marxist and Weberian traditions (Crompton, 2008; Savage, 2000). While both are conflict-oriented and usually relational, there are major

30 Conflict-oriented class analysis did face significant challenges from functionalists inspired by Talcott Parsons’ (1951) emphasis on equilibrium and naturalized class relationships and those inspired by Robert Nisbet’s (1959) argument that the concept of class had become useless for understanding issues of wealth, power and status.
conceptual differences between the two traditions. The disagreements within and between those in each tradition have centred mainly on the causal mechanisms of class – exploitation for Marxists and market capacity for Weberians, which for the latter leads to issues of subordination and domination but not exploitation per se. Other points of conflict exist around the role of agency (Weberians often critiquing Marxism as fixating on structure), dimensionality (Weberians accuse Marxists of unidimensionalism), and an inattention to variation among workers (Burris, 1987). Within, between and outside these two traditions, dispute has alternatively smouldered and raged over the basis of class, how to operationalize it for study, appropriate methodology for studying class relationships, its causal relationship to other forms of inequality and stratification, and whether class continues to be meaningful in social analysis.

Both the Weberian and the Marxian traditions are further differentiated internally by a number of debates that inhere within the social sciences more generally. One primary tension exists between a) those who consider classes to exist only if the population generally recognizes their membership in a class and acts based on this recognition (“realists”) and b) those who study class as an “objective” phenomenon. The former position is advanced by Marxian historians like E.P. Thompson and by a broad range of theorists of various theoretical orientation (e.g., Aronowitz, 2004; Kingston, 2000). The latter, sometimes described pejoratively as conducting “nominalist” research (Portes, 2000), distinguish between class-in-itself
and class-for-itself under the assumption that the “structure” of antagonistic
interests within capitalist society can be uncovered even if class consciousness\textsuperscript{31} is
not well developed. This approach has fueled much of the theoretically grounded,
quantitative class research that uses occupations as its basic unit of analysis.\textsuperscript{32} The
work of Florida and Bell, both central to optimistic theories of a new class, are
largely based in this tradition, depending on occupations as a central proxy,
supported often by data on educational attainment, from which conclusions are
drawn about class and societal change. Among Marxian class analysis, Wright’s
research is probably the best known, while John Goldthorpe’s class model is
probably the best known in the Weberian tradition (though Florida and Bell can also
largely be thought of as Weberian).

The rift between those constructing objective class maps and those who
argue class cannot be differentiated from consciousness is, in many ways, part of the
broader debate over the relationship between structure and agency. Those studying
objective aspects of class have been called positivists who ignore the rational,
conscious activities of workers and others, or at least place consciousness and
action as derivatives of structure, e.g., structure > consciousness > action
(Crompton, 2008; Edgell, 1993). Some like Giddens (1979) have attempted to rectify
(or bridge) the structure-agency dualism, at the same time as bridging the Marx-

\textsuperscript{31} This measure of “subjective” aspects of class examines recognition of identity (or awareness of class
existence); sense of conflict (recognition of opposing material interests); and visions of the future
(Seccombe & Livingstone, 2000; Wright, 1999).

\textsuperscript{32} The “employment-aggregate” approach to class analysis has been pejoratively described as “political
arithmetic” (P. Edwards, 2000).
Weber divide. In Giddens' structuration thesis, knowledgeable agents are continually (re)producing the structures that both limit and enable their agency in the various spheres of their lives. Despite synthetic efforts like Giddens', the division between those advocating a focus on subjects and subjectivity, on the one hand, and those advocating a more (neo)positivist focus on structural issues remains significant, playing out within the study of class and many if not all other social science disciplines.

Core Traditions in (New) Class Analysis

One reads in many places claims to the effect that Weber's corpus of work was undertaken largely in “dialogue with the ghost of Marx” (Giddens, 1971, p. 185). Val Burris (1987) acknowledges this point, but argues it goes both ways:

Today it could equally be said that the bulk of contemporary Marxist writing represents a prolonged dialogue with the ghost of Weber. Without always acknowledging the fact (or even necessarily being aware of it), contemporary Marxists have drawn heavily upon Weberian concepts in their effort to adapt classical Marxism to the conditions of late twentieth-century capitalism. This tendency is particularly characteristic of recent Marxist writings on the state, bureaucracy, legitimation, and the class structure. Theoretical viewpoints that were once “external” to Marxism and that commonly served as the basis for criticizing or rejecting Marxism, have thus been incorporated (albeit in an altered form) within Marxist theory itself. At the same time, there has been a parallel, if less pervasive, trend among Weberian theorists to reinterpret Weber’s sociology in a manner that renders it more compatible with the premises of Marxism. (p. 67)

While there is much truth in Burris' position, as I will show later through the work of Giddens, Wright, and others, I argue that part of the distance between Marxists and Weberians has been due to selective readings (Burris also makes this point). In my reading, summarized below and elaborated in Appendix A, there is more that converges within the original work of Marx and Weber than is usually
acknowledged, including an orientation to class as property but also in terms of the increasing comingling of capitalism and rational strategies like bureaucracy.

**Karl Marx.**

Marx set out to develop a comprehensive *explanation* of social change that looked to the struggle for control over material resources and productive activity as the fundamental engine of societal transformation.\(^{33}\) In his “materialist” view of history and social change, advances in the productive capacity of humans potentiate transformation in social relations: modes of production, in other words, contain the seeds of their own demise. For example, feudalism gave rise to merchant capitalists out of which developed a small bourgeoisie that was limited in its ability to expand production due to serfs’ tie to land and nobility. This brought the bourgeoisie into direct conflict with the aristocracy and, according to Marx, precipitated a series of political and productive crises that allowed the emergence of capitalist relations to flourish.

Capitalism, the main focus of Marx’s corpus, is plagued by contradiction as a mode of production, and is merely a transitive phenomenon.\(^{34}\) Marx perceived an inherently exploitative relationship between those who own and control the means of production (land, technology, factories, etc.) and those who possess only their

\(^{33}\) For Marx, productive work is central to what it means to be human, where the “reproduction of material life precedes the production of culture” (Seidman, 1994).

\(^{34}\) The fundamental contradiction in capitalism, according to Marx, is between use-value and exchange-value; more specifically, the displacement of the former by the latter in virtually every domain of human activity. Only that which can maximize surplus value becomes worth anything, and therefore worthwhile. This process is largely inseparable from the process of commodification, as production oriented to consumption (use) is supplanted by production oriented to commodities (and market exchange).
ability to labour. For Marx, within capitalism exploitation has become obscured behind the veil of “free labour.” Exploitation designates within Marxist thinking an interdependent relationship, where owners depend on the material deprivation of workers to increase their capital via owners’ legal right to value created beyond what workers are paid for. Marx predicted a polarization of classes as capitalists annexed businesses and sectors controlled by the self-employed, who then were forced to join the proletariat in paid employment. The class polarization thesis is quite clear in terms of: a) the role of machinery in reducing distinctions among labour and drawing workers together in complex labour processes; b) homogenization of the proletariat in terms of low wages; and c) the increase in hostility between the bourgeoisie and the proletariat that would ultimately lead to a communist society. What is less clear in Marx’s writing is if the “socialization” of workers in complex labour processes leads to an absolute deskilling, a relative deskilling compared to workers’ capacities (i.e. skill demands rise but not as fast as workers’ capacities), or an upskilling as capitalists depend more and more on workers’ ability to problem-solve in complex labour processes. What is also not clear is the extent to which this processes of proletarianization and socialization would lead to the homogenization of labour and, if it didn’t, how neo-Marxist class

35 Where private property is abolished, human capacity to labour—to transform oneself and nature, and to connect and realize one’s full range of intellectual and physical abilities—would be allowed to flourish. The use-value of labour would be restored as the primary motivator of activity, with exchange value quickly diminished and finally eliminated. The formal rationality employed by capitalists was in fact creating the material conditions (abundance) and collectivization of labour that would allow for its transcendence.
theorists should treat those with specialized skills who occupy privileged positions in the technical and social relations of production.

Rather famously, the third volume of Capital leaves off just as Marx is about to define what class is and, one would hope, how it might best be approached in empirical, historically grounded research. Very often writers attribute to Marx the notion that the proletariat is always-already in existence, as an objective class-in-itself even if it was not yet a class-for-itself, ready to fully embrace their class identity and recognize their revolutionary potential. But to attribute a simplistic two-class model and inherent “classness” (and class struggle) is to dramatically reduce the scope and complexity of Marx’s analysis. Besides sensitivity to the wide range of classes within society, as exhibited in *The Eighteenth Brumaire of Louis Bonaparte* (Marx, 1968), Marx seems well aware that workers will take on different roles in the labour process depending on aptitude. But such distinctions do not seem to exclude those working with specialized knowledge from the proletariat:

Since with the development of the real subsumption of labour under capital or the specifically capitalist mode of production, the real lever of the overall labour process is increasingly not the individual worker. Instead, labour power socially combined and the various competing labour-powers which together form the entire production machine participate in very different ways in the immediate process of making commodities, or, more accurately in this context, creating the product. Some work better with their heads, one as a manager, engineer, or technician, etc., another as an overseer, the third as manual workers, or even drudge [an assistant]. An ever increasing number of types of labour are included in the immediate concept of productive labour, and those who perform it are classed as productive workers, workers directly exploited by capital and subordinated to its process of production and expansion...And here it is quite immaterial whether the job of a particular worker, who is merely a limb of this aggregate worker, is at a greater or smaller distance from the actual manual labour. (1990, p. 1040; italics in original)
We have in this passage a number of interesting ideas. There is a sense here of a “natural” division of labour based on abilities among individual workers functioning as part of the “collective worker.” As well, we see Marx cast a very wide net—occupationally speaking—around productive labour. Engineers, managers and technologists are thus aligned with “manual” workers in their subordination as wage-labourers, exploited by the capitalist in the pursuit of commodity-based exchange-value. Yet it remains unclear in this passage, and in virtually all of Marx’s work, if engineers, managers, etc. were to be considered fully within the proletariat, in some sort of special class strata, or “productive” but not proletariat.

“Marxisms” have multiplied over the course of the twentieth and early twenty-first century, with all sorts of variants of neo-Marxists, post-Marxists, Marxist-feminists, and so on claiming the proper theoretical route forward. This is, in many ways, as it should be. Marx leaves us, on the one hand, a theory of history that claims to uncover a directionality driven by a dynamic, deeply immoral mode of production. On the other hand, he leaves us with an unwavering commitment to study historical variation (Marx, 1972), the ways in which classes form or do not form, and a stated condemnation of theory that propose to map out history without detailed study of history (Giddens, 1979). Marx’s work embodies in this way the ambiguity and conflict that has animated so much of the structure/agency debate within the social sciences, generally, and the debate over the classness of professionals and other specialists, specifically. Marx’s privileging of material reproduction above all else, his emphasis on class relationships as causal for social structure and social change, his predictions on the polarization of classes and the
desirability of communism, and his optimism towards machinery, automation and rational organization converge and diverge in important ways with the second “foundational” theorists I examine, Max Weber.

Max Weber.

At the millennial transition between the nineteenth and twentieth centuries, profit-seeking organizations were continuing to become more complex as they expanded upwards and downwards—pursuing vertical integration and economies of scale—and outwards—pursuing geographically diverse markets. Clerical and managerial occupations grew as administrative structures were implemented and entrenched via bureaucratic rules. Such changes were central to the work of Max Weber, a German intellectual whose work on the multidimensionality of social power, of which class is but one dimension, is often characterized as both critique and extension of Marx’s more economistic approach. In many ways it is easy to see how the work of Marx and Weber have led to quite different approaches to the study of the social world. Weber was decidedly romantic about the past, conservative even, in his concern with disenchantment and the loss of a unifying story to ensure a cohesive moral public.

While both were struggling with some of the same issues of history and historicism, of agency and consciousness, and of the impact of contradiction on systemic change, Weber was clear in his rejection of universal laws or linear patterns to historical development. Weber’s study of the rise of rationality in Western culture belies not only a pessimism about the future of individual freedom but in many ways suggests, contrary to his professed non-teleological ontology, a
subtle but identifiable history-making contradiction of its own. In contrast to Marx and his emphasis on material (re)production, Weber saw the dominant, central trend as “intellectualization” or the rise of scientific ideas and technological knowledge. This process Weber calls “disenchantment,” whereby bodies of knowledge that provided humans with “ends”—religion, metaphysics, theology—are replaced by a way of thinking that is rational, impersonal, calculating, and systematic (SH Kim, 2004). Ultimately, for Weber, this intellectualization was built upon an approach to understanding the world (science) that could not contribute to human cohesion and production of shared cultural goals; modern science presented knowledge of the world that was inherently falsifiable (Maley, 2004).

Paralleling in important ways Marx’s admiration for but ultimate condemnation of capitalism, Weber found in the rational outlook the potential for both emancipation and rigid domination.36 For Weber, the privileging of formal rationality has the potential to suppress creativity, individuality, and free expression, creating a society ruled by self-important and self-congratulating technocrats. For Weber, the rhythms of politics, work and private life were increasingly falling under the sway of specific manifestations of formal rationality. Charisma, individual decision-making, and culturally unifying value systems were being pushed out by ideological commitment to efficiency maximization, planned

36 While calculability and predictability can increase human freedom by allowing individuals and groups to understand and control the complexity of society and natural forces, simultaneously, rationality can also encourage and enable a fixation on efficiency, the subordination of human intellect to the rhythm of machines, and the structuring of human activity within “escape-proof” (Weber, 1978, p. 1401) bureaucracies. In my reading of Weber, there is no suggestion of this contradiction necessarily being resolved (dialectically or otherwise).
structure, and measurement. Weber saw this form of rationality coming to dominate two primary spheres of human reproduction and organization: the bureaucracy and the factory. Together, the “animate machine” of bureaucracy and the “inanimate machine” of the factory are “busy fabricating the shell of bondage” (1978, p. 1402).37

For Weber, then, capitalism is not the primary cause of oppression; rather, formal rationality embodied in productivity-first industrial design and bureaucracy is the villain against which humanity must struggle. It was this conclusion that led Weber to largely dismiss Marx and others who promoted the desirability of communist social organization. The “abolition of private capitalism would simply mean that also the top management of the nationalized or socialized enterprises would become bureaucratic” and that “[s]tate bureaucracy would rule alone” (1978, p. 1402; italics in original). In other words, human emancipation has everything to do with challenging a way of thinking, bureaucracy, that organizes the material (re)production that was central to Marx’s theorizing. It is in this conviction that we see, however, an ambiguity that permeates Marx’s work as well, between history as contingent and as history as predictable. It is this pessimism over socialized ownership, over rational organization, in combination with his liberal politics (Giddens, 1995), that must be recognized when approaching Weber’s understanding of class and the multidimensionality of power.

37 Weber writes about the future that, whether capitalist or communist, the “future belongs to bureaucratization” (1978, p. 1401). Weber acknowledged that other forms of organization existed beyond bureaucracy, and that the factory was not the only type of commercial enterprise, but “both determine the character of the present age and of the foreseeable future” (p. 1401).
Weber’s well-known theorization of the multidimensionality of power includes class, status, and party. Regarding class, Weber certainly downplays, if not outright rejects, Marxian notions of exploitation yet he recognizes that “property” and “lack of property” are the “basic categories of all class situations” (1978, p. 927). The two primary features of Weber’s understanding of class include: 1) the central role of variation within classes; and 2) participation in the market as the “decisive moment” for identifying common class locations and interests.\(^{38}\) Weber’s “social classes,” combining property and commercial divisions are broad aggregates, including: 1) the working class “as a whole” (p. 305); 2) the petty bourgeoisie; 3) the (“propertyless”) intelligentsia and specialists (technicians, while-collar workers, and civil servants); and 4) classes privileged through property and education. Weber frequently provides caveats on the possibility for significant variation within classes, to the point where it sometimes seems as if there could almost be unlimited differentiation among workers (see Giddens, 1973). This emphasis on variation fits with Weber’s broader commitment to the contingency of class composition and, especially, class action. While Weber’s attention to the multidimensionality of power (i.e. a non-reductionist approach) is recognized, less recognized is how close Weber ends up to Marx’s conclusions about the potential (even likely) centrality of class (struggle):

\(^{38}\) The confluence of property, market situation, and various locales where class “happens” leads Weber to an overall class typology that emphasizes property but at the same time recognizes that in (then) contemporary society—characterized by increasingly sophisticated production, complex bureaucracies, and the importance of theoretical and formal rationality—privilege was based not only on ownership but also education.
“Without regard for persons,” however, is also the watchword of the market and, in general, of all pursuits of naked economic interests. Consistent bureaucratic domination means the leveling of “status honor.” Hence, if the principle of the free market is not at the same time restricted, it means the universal domination of the “class situation.” (p. 975; italics added for emphasis)

Such an assessment stands in seeming contradiction to Weber’s rejection of any attempts to predict the future based on theory.

Such pessimism is in stark contrast to Marx who, despite his pervasive and scathing critique of 19th century capitalism, was decidedly more positive about the future. For Marx, it was not rationality, science, or machines that were the problem, it was how such material and organizational technologies were implemented under capitalist relations of production. In fact, the scientific approach to production, which increased output and reduced human want, was in many ways welcomed by Marx as a necessary step toward heightened contradiction. This phenomenon is captured in the Marxian contradiction between the socialization of the forces of production and the privatized nature of accumulation. While it remains disputed whether Marx believed this contradiction would necessarily resolve itself based just on the contradiction itself (i.e., structurally determined teleology), the dialectical philosophy within which the contradiction is located—and which Marx ascribed to—suggests that it is “determining” of the direction of social change even if class struggle will be necessary to ultimately “resolve” it. These are important points of divergence. There are also important points of convergence, as detailed above, around the concept of class and its role in structuring society and struggle that are worth summarizing. First, for both Marx and Weber, classes are not gradational but rather relational. Second, property is the fundamental axis of class differentiation.
Third, classes exist as structural, objective groupings within social relations from which class-based consciousness and action may or may not occur. Finally, capitalism, and the (formal) rationality it depends so heavily on, tend to breakdown other forms of stratification and push class relationships to the fore (see Giddens, 1973, 1995; Wright, 2002).

Theories of a New Class

Impacting all aspects of the debate around a new or knowledge class have been the two, inter-related phenomena described in Chapter One: 1) the growth in the size and complexity of organizations over the last century or more that has necessitated the delegation of planning, coordinative and disciplinary responsibility to employees (executives, managers and, to some extent, supervisors); and 2) the expansion of professional, technical, and managerial occupations within both the private and public sectors, as the division of labour has become more complex and detailed. The first phenomenon can be more or less captured by the idea of a “separation of ownership from control.” The second phenomenon is less easily captured in a single catch-phrase; for Marxists, orthodox ones at least, the growth of specialized and managerial labour has come to be thought of as “the embarrassment of the middle classes” (Polák, 2008). For those less tied to the orthodox Marxist

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39 Wright (2002) highlights the point that Weber calls these “class conscious organizations” while Marxists use a variety of terms to translate Marx’s notion of “class-for-itself.” Wright concludes that, “regardless of terminology, the basic idea is similar: Structurally defined classes may have a tendency to generate collectively organized forms of struggle, but the two must be conceptually distinguished” (p. 839).
tradition, what the growth in such occupations means for the study and relevance of class is less embarrassment than sociological puzzle.

The “embarrassment” emerges from Marx’s apparent prediction of a linear trend toward class polarization, as outlined above. A conceptual lack of clarity around class and exploitation as it applies to specialized workers also plagues the Marxist tradition: are they partially exploiters, partially exploited, a complex amalgam of both, or is exploitation no longer relevant for understanding class relations in complex labour processes and organizations? The responses by those engaged with Marxist theory span the spectrum of “new class” theories. For other researchers, working in traditions less or not at all attached to orthodox readings of Marx (e.g., neo-Weberians, conflict theorists, etc.), the growth of white-collar occupations demanding knowledge and problem solving was and is far less problematic, and for some predictable. Weberian researchers tend not to be constrained by the same sort of concern with theoretical orthodoxy as those in the Marxist tradition (1997).40 Central to Weberian and many neo- and post-Marxist studies of the “new class” is whether or not increasing demand for specialized knowledge in capitalist production and the delivery of services (public or private) is

40 Marshall (1997) argues that the diversity in Weberian approaches emerges from a common orientation to the study of class. That is, the Weberian approach: “Entails no theory of history according to which class conflict serves as the engine of social change; implies no theory of class exploitation, according to which all class relations must be necessarily and exclusively antagonistic; Takes in no theory of class-based collective action, according to which individuals holding similar positions within the class structure will thereby automatically develop a shared consciousness of their situation; and Does not embrace a reductionist theory of political action – collective or individual – according to which such action can be understood simply as the unmediated expression of class relations and the pursuit of structurally given class interests. (pp. 50-52)
sufficiently powerful to alter entrenched patterns of subordination and domination 
a) between privileged workers and employers and b) among the employed. Some in 
the Weberian tradition have aggregated owners, senior executives, and 
professionals (e.g., Erikson & Goldthorpe, 1992). Others, such as Anthony Giddens 
(1973), distinguish ownership, market capacity (formal education and specific 
vocational skills), and domination, and in fact end up quite close to neo-Marxist 
class schemes (Giddens, 1994).41

In terms of framing the new class debate, there are some existing options. 
Szelenyi and Martin (1988) build their analysis around three “waves” of new class 
theorizing. The first involved “anarchist theories” of the intellectual class (1870-
1917), the second “technocratic-bureaucratic” class theories (1930s through the 
1950s), and the third the “knowledge-class” theories of the 1970s. This is a useful 
approach, drawing attention to the main thrust and dominant voices of a given 
period. However, I find this framework a barrier to drawing attention to the 
ocurrence of similar new class arguments over time; that is, proposals of a new 
class tend to be more cyclical than secular, even if iterations reflect their historical 
circumstances. Another approach is suggested in Kurzman and Owens’ (2002) 
review of the “sociology of intellectuals”, where they designate various theories 
according to whether they treat intellectuals as: a class-in-themselves, class-bound, 
or class-less. Their approach provides strong conceptual hubs around which various 

41 Giddens’ analysis in fact emerges from an explicit attempt to integrate Marx and Weber, and he rejects 
assertions that his class scheme is Weberian rather than Marxist. I deem him Weberian based on his near 
total rejection of historical materialism, but realize this designation is problematic.
theories might be placed but is ultimately too general for the purposes of this
analysis. Likewise, Barbrook's (2006) assertion that all new class theories can fit in
one of two camps, the “new ruling class” or the “new working class” (20), is a binary
that fails to make substantive differences explicit (or possible).

My framing of the “new class” debate results in four broad theoretical camps
that have largely held their theoretical shape over the last 75 or so years:

1) Those optimistic about a powerful if not dominant new class of educated
workers who are transforming society for the better;

2) Those who perceive a dominant new class that is deeply self-interested, and
likely to perpetuate the subordination and deprivation of the working class;

3) Those who believe most professional and technical labourers are or will end
up part of the working class; and

4) Those who consider highly educated professions, semi-professions and
technical jobs part of a “middle” class, permanently constrained between
capitalism's elites and the working class (the primary division amongst
“middle” class theorists is between those promoting a distinctive middle
class with identifiable boundaries and those promoting a spectrum of
specialized labour working under contradictory circumstances between
capital and labour).

The debate over the trajectory of new specialist occupations—whether a new class
or classes existed, membership (e.g., managers, managers and professionals, or
some other distribution), and potential to upset traditional social relations in the
workplace—probably peaked within academia in the 1970s and 1980s (Barley,
2005), but it certainly began long before and, as I describe below, continues to the
present. In the remainder of this chapter I lay out the “new class” debate. I begin by
reviewing key contributions from this camp. Subsequently, I move on to review
other camps that disagree about the affiliation, cohesiveness and interests of those
in specialized and managerial occupations. Of particular note is the similarity
between current iterations of the new class and older theories within each camp. In
contrast to complaints that sociology and sociologists tend to fixate on change, and in the face of serious ontological, epistemological and methodological challenges, there is ample evidence of continuity within all the camps over the last 50 to 75 years.

**New Class Dominance: Ascendant Agents of Progressive Change**

The perspective that has held the most sway popularly and increasingly academically has been an optimistic vision of an emerging—for some already entrenched—knowledge class.\(^{42}\) Held as exemplary if not archetypal are the collegial atmospheres in some of the major IT companies (Kleinman & Vallas, 2001). Despite the bursting of the “dot-com bubble”, the high-tech sector continues to promote itself as a place where (if you’re highly skilled) your opinion counts and you are free to “be yourself,” wear blue jeans, play Xbox in the lunchroom, and spend many afternoons in employer-sponsored training. Even if you put in long hours it’s ok because you love your job (Florida, 2002; Reich, 1991). Involvement, empowerment, teamwork, delayering, decentralization, and flexibility; these are the catchphrases used to describe the (necessary) structural reshaping occurring in “knowledge-intensive” and many traditional service and industrial organizations.

\(^{42}\) Much of the evidence from Chapter One on human capital, occupational redistribution, and rising educational attainment constitutes the girders supporting such contemporary claims. Bad jobs of the industrial heyday—where work was physically taxing, monotonous, often low paying, dirty, and sometimes dangerous—are being replaced by “good jobs” in the service sector. Focus here is on “skill-biased technological change” (Autor, Levy, & Murnane, 2003; Machin, 2003) and the resulting growth of occupations demanding high levels of formal education: graphic designers, programmers, technical writers, engineers, lawyers, architects, managers in creative or technically sophisticated fields, teachers, those in research and design, and other similar specialized jobs.
The body of scholarship that surrounds the idea of a powerful knowledge class proposes a dramatic transformation in the social relations of production within advanced capitalist nations like Canada, driven largely by technological and scientific advances that are in turn implicated (if not determining of) changes in trade, the power/autonomy of the state, manufacturing automation, and the increasingly international nature of commodity production and capital markets. Capitalism, as an economic system benefiting capitalists, has been transformed from the inside by its own logic.

Theories of a knowledge class appeared in a variety of forms throughout the 20th century (see Barbrook, 2006; Kurzman & Owens, 2002). Out of these, the key contemporary contribution to the knowledge class corpus was Daniel Bell’s *The Coming of Post-Industrial Society* in which he focused on the potential of the knowledge class to use its newfound power to reduce inequality and conflict. Bell portrayed an American society in flux, struggling to re-adjust to the shift from manufacturing to service work and to the ascendance of a professional and technical “class” made up increasingly of highly educated scientists and engineers. Bell proposed that knowledge has joined with property to form the two major axes of stratification, the reason being that manufacturing and service industries had become dependent on codified, theoretical research and development prior to production. Along these emerging lines of stratification, a new “knowledge class” was forming. As this class grew, however, Bell recognized that divisions will form and a new status hierarchy will emerge within it. At the top will be the creative elite of scientists and top professional administrators, next will be a middle class of
engineers and academics, and finally a “proletariat” of technicians, junior faculty, and teaching assistants (p. 214).43

Robert Reich (1991), a former Secretary of State under the Clinton administration, presents a modest if optimistic variant of the knowledge class thesis. Reich has made a notable contribution to the idea of a powerful new knowledge class. Ambivalent about the “new economy”, he nevertheless argued that growing numbers of workers (upwards of a fifth) are now “symbolic analysts”, gaining wealth and power based on their ability to use formal and tacit knowledge to deal with uncertainty. The “symbolic analysts” can be found “problem-solving, problem-identifying, and strategic-brokering” (p. 177) across all sectors of the economy, not just in high tech and research organizations. Less fortunate are those working in one of the other two dominant sectors: routine production services and in-person services. Those in the “routine production services” include both traditional blue-collar manual workers and information-processing workers. Here, old oppressions persist and workers are expected by employers to be reliable, loyal, and malleable to orders from above. Similar to labour market segmentation theory and the idea of an advantaged core of workers and a much larger disadvantaged periphery, Reich believes routine production service workers to be particularly prone to outsourcing in the global economy. Employer expectations for “in-person service” workers are

43 In many ways, Bell was an advocate for social justice, arguing that the rationality that has so far been turned to individualistic pursuits within a free market system must and would be re-directed in a more community-oriented direction. It will be the responsibility of the knowledge class to use its intellect and problem-solving skills to ensure the inclusion of every citizen in the “knowledge society” (p. 212), to plan a more equal distribution of goods and income, and to enforce “social responsibility” (p. 289) on corporations.
similar, but they are also expected to exhibit a pleasant demeanour, what has been included under “emotional labour” (Hochschild, 1983) elsewhere. Reich notes that social stereotypes have meant women are over-represented in this category. According to Reich, symbolic analysts work in organizations where hierarchies are dissolving and they “often have partners or associates rather than bosses or supervisors” (p. 178; see also Kleinman & Vallas, 2001). Rather than productivity, they are evaluated on quality and originality of work.

One of the best-kept secrets among symbolic analysts is that so many of them enjoy their work. In fact, much of it does not count as work at all, in the traditional sense. The work of routine producers and in-person servers is typically monotonous; it causes muscles to tire or weaken and involves little independence or discretion. The “work” of symbolic analysts, by contrast, often involves puzzles, experiments, games, a significant amount of chatter, and substantial discretion over what to do next. (p. 222)

They are the lucky ones, freed from the grip of market pressures and managerial penny-pinching.

Management guru Peter Drucker (1959), who is frequently referenced as the coiner of the term “knowledge workers,” was instrumental in the concept’s uptake by business, management theorists, and academics. Drucker painted an optimistic picture of a powerful new class of employees radically altering the economic and occupational landscape via their application of rational principles in both the factory and the office. Drucker's later work (1993) on the knowledge class takes Bell’s (and Reich’s) claims a step further, contending that a fundamental change in the structure of capitalism has occurred. He argues that knowledge is not just equal to capital, but has in fact replaced wealth as the primary source of socio-economic power. Knowledge workers, according to Drucker's analysis, now own both the means of
production (by which Drucker means the organization as a legal entity) and the tools of production, “the former through their pension funds, which are rapidly emerging in all developed countries as the only real owners; the latter because knowledge workers own their knowledge and can take it with them wherever they go” (p. 8). According to Drucker, the basis for Marxist preoccupations with class and inequality in the social relations of production has been left behind because workers are in control: capital now serves the employees in general, just as information technology has come to serve the knowledge employee. Jobs in manufacturing will shrink to the point of irrelevance, leaving only two classes: service workers and knowledge workers. While Drucker acknowledges some status differentiation within the latter group—composed of knowledge executives, knowledge professionals, and knowledge employees—these workers know more than anyone else in their firm about their given speciality, and therefore cannot be supervised, cannot be “told what to do, how to do it, how fast to do it, and so on” (p. 65). In such a work environment, rank and “command positions” (p. 93) disappear and leadership shifts depending on an organization’s specific assignment.

Manuel Castells’ (2000) well-known and influential analysis captures the tension between humanist concerns with the quality of work, on the one hand, and technological progressivism and determinism, on the other. Such concerns have dominated thinking about the knowledge-based economy. Providing exhaustive research on the confluence of IT, innovative communities, business networks and global markets pushing Western nations toward an “informational” socio-economic form, Castells (1989) calls the new labour process an informational mode of
development where “knowledge intervenes upon knowledge itself in order to generate higher productivity” (p. 10). Castells does recognize, however, that restructuring of capitalism has led to socio-economic polarization along the lines of wealth and knowledge. In Castells view, this polarization is neither a natural phenomenon (pace Drucker) nor a situation that will be alleviated by the application of rational thought to social dilemmas (pace Bell). In addition, Castells (like Reich) makes an important point regarding the manufacturing-service-knowledge distinction, arguing that such divisions are increasingly untenable. Castells (1989) posits that services are so diverse they cannot be thought of as a homogenous sector, and in fact many are closely linked with production (p. 129). Likewise, knowledge work occurs in a “milieux of innovation” (p. 82), traversing both traditional and emerging industries and sectors. Yet, in spite of these insights, Castells nevertheless presents a rather homogeneous and mainstream assessment of knowledge workers, arguing they have become “valuable”, “unique”, and “irreplaceable” (1989, p. 81).

Richard Florida’s broadly popular book, The Rise of the Creative Class (2002), picks up on many of the same themes. He declares that formally educated workers—especially the “super-creative core”—now control the means of production. The non-monetary “cultural capital” identified by Pierre Bourdieu (1984, 1986) has gained immense economic value,44 and the ascendancy of the creative class means that their liberal values are being (or, more accurately, must

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44 See also Gouldner (1979) and his discussion of the "cultural bourgeoisie."
be) adopted by regions and cities wishing to be economically relevant in the twenty-first century. Florida builds a number of indices to support his claim, linking social tolerance and diversity in U.S. cities to economic success. Not yet a class in the subjective sense, in that they do not recognize their collective “classness,” the power of the creative class is nevertheless quite real and rests on creativity having passed knowledge as the key economic resource. The crux of Florida’s analysis, though, is that unlike knowledge, which can be codified and commodified, creativity is tacit and resides “in” a person. In other words, the “knowledge-based economy” was a mere transitional phase along the way to this new “creative age.” Organizational practices have not, however, entirely caught up and the adoption of a “creative ethos” (p. 22) is uneven. Florida identifies traditional bureaucratic principles (rules and hierarchy) negatively but believes the ideology and workplace needs of the creative class are forcing companies to adopt what he calls “soft control” approaches. But this does not mean “autonomy” for workers, as the creative process is always a social process demanding organization (especially for complex scientific and technical work) and thus the tension between creativity and organization will never fully disappear.

The unevenness and tension within organizations trying to deal with new creative needs of employees that Florida describes is reflected in his description of the class structure. Acknowledging grey areas and boundary issues, Florida nonetheless differentiates between a working class, a service class, and a creative class. The latter is further broken down into a “super-creative core” of those in science and engineering, software programming and systems analysis, music,
design, education, and the arts, “creative professionals” in business, finance, law, health care and other similar fields, and a range of technicians deemed to apply knowledge in local, unique ways (e.g., emergency responders). The creative class, according to these parameters, is larger than the traditional working class and claims around a third of the U.S. labour force. And Florida promises that growing creative needs of organizations will lead to the expansion of the creative class, as well as creative activities among working class and service class employees (e.g., continuous-improvement programs on the shop floor).

Similar celebrations of a new dominant class abound, but there is no need to belabour the point. Dominant in the fields of economics, management theory, and mainstream sociology is a readily apparent belief that knowledge (and now possibly creativity) has taken on unprecedented economic importance, fundamentally altering the dynamics of power within capitalist social relations of production. Another camp claiming a dominant new knowledge class interprets their impact in a far less rosy light. While agreeing that the value of knowledge has meant a fundamental shift in socio-economic power, theirs is a vision of inequality intensified, the working class still dominated and exploited.

**New Class Dominance: Exclusion and Self-Interest**

While agreeing that a new elite class of cadres, technocrats, managers and professionals has or is rapidly attaining economic and social control, those who look on the new class pessimistically believe that, in pursuing and achieving economic dominance, this new class has transformed society in a hyper-rational and, ultimately, an anti-democratic direction. The subordination of the masses or
working class is now based not only on exclusion from ownership of the means of production, but also on exclusion from expert knowledge and decision-making processes. Some quasi-functionalist theorists have actually celebrated the knowledge class as the “New Barbarians” (Angell, 2001) or a “Netocracy” (Bard & Soderqvist, 2002) who will rightfully dominate the digital economy at the expense of subordinate workers.

Around the same time as Bell was articulating his optimistic vision of the knowledge class, Ivan Illich (1977) challenged the mystification and institutionalization of professionals’ power, with many of the supposed services offered actually creating additional “needs” among the populace. The growing number of public and private sector experts and professionals were, according to Illich, subordinating the general public for their own gain. Illich’s work can be traced back to Michail Bakunin, a Russian anarchist, who coined the “new class” term in 1870 (Szelenyi & Martin, 1988). Central to Bakunin’s concern was the potential for communist impulses to be subverted by the need for scientists and scholars to coordinate an increasingly complex society, and the despotic, anti-democratic consequences of a “reign” of scientific intelligence. In many ways, Bakunin’s fear was realized in Lenin’s pre-revolutionary theorizing that any move towards communism would have to be led by “revolutionary professionals”. This group would have to be drawn from the intelligentsia of the propertied classes who were in fact the source of the theory that alone could take trade-union consciousness past its compromising tendencies (Milner, 1999). Bakunin’s fear was also realized in practice, in the administrative and political classes that emerged within Russia’s vast communist
bureaucracy, and whose privilege depended on the immiseration and
disempowerment of the masses (Szelenyi & Martin, 1988).

Charles Derber (1990), in contrast, is critical of the way professionals and
other educated groups use claims of science and neutrality to discredit “ordinary”
knowledge in order to build dependence on “expert” guidance. This class of the
educated—owners of their knowledge—are less and less often working
independently or even semi-autonomously. Rather, the trend is towards
professionalism and scientific activities within corporate structures, leading to what
Derber describes as a new “Mandarin capitalism”. The divide within society is not
between blue- and white-collar workers; instead, and picking up on themes raised
by Randall Collins’ credential society, Derber argues the age-old division between
mental and manual labour is occurring within service organizations, between the
credentialed and the uncredentialed. Others, like John Raulston Saul (1992), argue
that the promise of rational thinking is being wasted by “rational elites” who
embrace amoral principles in their management of the state and the economy. While
Saul’s argument is somewhat weakened by his reliance on the French model elite
production in the grandes écoles as a universal model, and generalized to North
America, his analysis of the rise of power of elites among specialists builds in a
convincing way on Wright Mills’ “power elite” and is echoed by well-known
a polemic against the worship of technology and the primacy of efficiency and
economic advance. This has in part led to, and in part resulted from, the hegemony
of “technocrats” in the U.S. and other Western nations as they sought and continue
to seek to create a world where their technical and administrative skills are most valuable.\textsuperscript{45}

For Donald Hodges (2000) a “post-Marxist” economic analysis leads him to conclude that analyzing the economy based on private ownership of capital and goods is an obsolete approach (p. 5), and that the new knowledge class has overtaken the capitalist class as the beneficiaries of the “post-capitalist” system’s exploitation of the working class. In the U.S., and increasingly in other advanced capitalist nations, class struggle has been succeeded, but the result has not been what Marx(ists) predicted or desired. What has developed is “a dictatorship of professionals over both labor and capital—a republic of experts” (p. 149). This new dominant class is not simply demanding a premium or “rent” (Sørensen, 2005, p. 136) for their knowledge, rather their knowledge forms a new axis of exploitation as evidence by their lion’s share of total (U.S.) revenues. A (still) subordinate working class labours in vast organizations, the value of their surplus labour still flowing upwards, the only change being “who” the recipient is.

**New but (Working) Class Bound**

Unlike the previous conceptual camps, where highly educated employees are proposed to have split from the traditional working class to chase power and wealth, a number of mainly Marxist researchers responded with theories that the

\textsuperscript{45} In a self-referential twist, Szelenyi and Martin argue that most of the “new class” claims have in fact been wishful thinking on the part of the intelligentsia, hitherto failed projects to supplant the capitalist class. Writing in the late ’80s, they did however consider at that time the emergence of a dominant new class a “distinct possibility” (p. 662).
growing numbers of intellectual labourers are “class bound”. Over the years, the 
idea of educated workers remaining within the working class has given rise to such
proposed class fractions as the Intellectual Proletariat, Scientific Intellectual
Labourers, the White-Collar Proletarians, and the Cognitarist, to name just a few
(see Barbrook, 2006 for a complete list). While sometimes revising Marx in
important ways, the “new working class” has often been an attempt at rescuing a
Marxist teleology where the proletariat is the only group capable of undertaking a
socio-economic revolution. There are two primary streams of thought within this
camps: one sees a trend toward homogenization via the “socialization” of the labour
process; the other sees specialized workers as a new class stratum within the
proletariat.

Michael Hardt and Antonio Negri describe at length a new transnational
order, or universalizing capitalist Empire (2000), which depends in large part upon
the combination of democratic elements (the Internet) and oligopolistic elements
(Broadcasting). However, more and more transnational corporations and dominant
nations like the U.S. are fighting to establish and consolidate “quasi-monopolies over
the new information infrastructure” (p. 300). In what they call the
“deterritorialization of production” (p. 295), spatial boundaries are broken down
and the need to bring workers into close proximity or under centralized watch
disappears. This, in combination with the increased mobility of capital and its ability
to simply “withdraw” from negotiations, has undermined the bargaining power of
all workers. Different from Serge Mallet’s “vanguard of the working class,” Hardt
and Negri foresee a generalization of skill and knowledge as those performing so-
called “immaterial labour” join with material labourers and a host of other subordinated groups to form a global, social “multitude.”

This hope for a growing, potentially revolutionary “general intellect” existed within the autonomist Marxist movement originating in Italy, in which Negri was a central player. In North America, Nick Dyer-Witheford (1999) and Paul Adler (2006c) have proposed similar arguments, with the former directly inspired by Negri’s work. Dyer-Witheford and Adler share a conviction that the labour process (and society in general) is characterized by rising complexity, knowledge-intensity and social and technical networks that draw workers into greater interaction and interdependence. There are important differences, however; the autonomist analysis is heavily oriented to agency, Adler’s to structure. The autonomist argument begins with workers’ struggles and seeks to understand socialization as not just an expression of the need for greater productivity but the need of capital to respond to the working class as it constantly tries to assert control. As labour tries to “compose” itself into a collective agent, capital seeks to “decompose” labour through restructuring, deskilling, relocation, and division. But such innovation has a simultaneous effect of redistributing skills, enhancing cooperation, and generally upgrading the complexity of work as more and more labour occurs on or through sophisticated information technology. While Negri (and Hardt) prefer the idea of a “multitude” of workers in cooperative relations performing ever more complex “immaterial labour,” and Dyer-Witheford prefers the concept of the “global worker” (N. Dyer-Witheford, 2001), both offer strong arguments toward the homogenization of workers and workers’ interests. Concerning specialized labour, Dyer-Witheford
acknowledges that global capitalism has made some specialized labour of “exceptional importance” (1999, p. 143) but that such work is immensely precarious and subject to the whims of capitalist restructuring:

[A]nalysis that sees “symbolic analysts” as the crucial actors in globalization does not grasp the speed with which capital tosses yuppies from the lifeboat when cheaper replacements can be found. Even symbolic analysts feel the blast of globalization, as North American computer programmers are undercut by Lithuanian or Indian competition, and architects, engineers, and professors discover that those who can telecommute can always be teleterminated by cheaper services uploaded from anywhere on the planet. (p. 143)

Adler’s argument is oriented to structure, in contrast. For Adler, the competitive, dynamic nature of capitalist economy is the determining factor, and while advances in socialization are uneven there is a steady trajectory toward more complex work, greater participation in job design and operational decisions. The capitalist elite, quite literally, can’t help themselves. They are compelled to look to workers’ capacities, enhanced through greater cooperation and more advanced technology, in order to improve the efficiency of the production process. But the capitalist elite cannot give over too much control over the production process for fear of having to pay workers more and/or losing their right to claim all profit. The need to maintain the exploitative relationship inhibits the full use (or “flourishing”) of workers’ abilities. As Adler writes:

[T]he overall effect is to create a working class that is increasingly capable of taking on successfully the task of radically transforming society and of assuming the leading role in a new form of society. This task is made progressively easier by the gradual socialization of relations of production even within the womb of capitalism itself, notably in the form of the increasing concentration of capital and growing role of government in the economy. (p. 25)
Workers at many skill and status levels, if not all, are being armed with the skills they need to overtake the capitalist structures of power. In this sense, the privatization of knowledge upon which many specialist occupations are founded is not sustainable, and this is a good thing. I return to examine Adler’s work in more depth in the next chapter.

In one of the better known articulations of the second line of theorizing, Serge Mallet (1975) pointed to the growing numbers of workers who are at the centre of advanced production systems as evidence of rising contradictions within capitalism. These workers have gained decision-making power in order to do their technically complex jobs, and they want more. They are and will become even more so the vanguard of the working class, the leading edge of a movement to dismantle the capitalist social relations of production. In many ways, Mallet’s descriptions of elite workers and their inclination towards progressive politics echo Daniel Bell. The fundamental difference here is that one man’s revolutionaries were the other’s reformers.

Clement and Myles (1994) make a claim similar to Mallet, though driven by empirical findings rather than concerns with resuscitating Marxist theory. In comparing Canada, the U.S., Sweden, Norway and Finland, major points of postindustrial convergence and divergence are found.46 Of particular relevance to

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46 These postindustrial economies were similar to each other (and different from industrial economies) in: 1) the reestablishment of the self-employed and small business owners; 2) a trends toward flexibility and a socialized labour process (“decentralized decision-making”); 3) the influx of women into the workforce; 4) the growth of specialist occupations (a “new labour aristocracy”); and 5) the growth in managerial roles
this study are Clement and Myles findings and argument relating to decision-making and the class structure. They find in postindustrial countries decentralization in decision-making. In contrast to stable industrial industries where products, technology and markets are well understood and relatively predictable, postindustrial markets tend toward the competitive and the uncertain. In such cases, and similar to Adler et al. above promoting socialization of the labour process, Clement and Myles find that managerial surveillance is less intense and managers are more concerned with operational matters. Routinization and centralization are less likely. In this context, Clement and Myles propose that a “new labour aristocracy” of knowledge workers has emerged in postindustrial countries. They recognize the political and theoretical implications of the rise of knowledge workers, but argue that most are (privileged) direct commodity producers and do not directly supervise the work of others. They aren’t denying the existence of a middle class, only that such an intermediate class is made up of managers and supervisors only. Clement and Myles explain that:

This class is ambiguous since it both oversees others and is itself directed by more powerful actors, to whom it is obliged. Members of the new middle class are employees but brought into the command and planning structure of workplace bureaucracies. Their material position places them “between” employers and labourers with the potential to be pulled either way in their alliances. (pp. 241-242)

and power (a “new middle class”). The postindustrial economies in the study diverged in: 1) the role of the state (service sector growth in Scandinavian countries tended to be “welfare” state-driven); 2) level of unionization in postindustrial service sector work (Scandinavian countries had much higher levels); 3) variation in production relations (e.g., the history of intense industrial-sector managerial surveillance in the U.S. carried through to the postindustrial sectors); and 4) variation in class politics (class cultures have changed or not changed in uneven ways depending on historical traditions).
But Clement and Myles provide an important nuance often missing from postindustrial and new class theories – managerial surveillance, decentralization, skill use, and class structure vary between regions and countries. They argue that “national practices developed in the era of industrial capitalism to organize relations of ruling are not obliterated by postindustrialism” (p. 247). For example, the greater intensity of managerial surveillance in the U.S., with concomitant ability to carry out work with less skilled labour, carried through and leads to the U.S. having a comparatively low percentage of knowledge workers. Canada, with high American ownership in industry but not in services, exhibits tendencies in industrial relations more like the U.S. but relations in postindustrial services more like Scandinavian countries. In their claim of a labour aristocracy and a new middle class Clement and Myles bridge two camps, and have much in common with some of the theories of distinct and not so distinct intermediate class(es) presented below.

**Holding Their Ground: The Intermediate Class(es)**

In contrast to the idea that the new class is a dominant class-in and for-itself, or class-bound, an alternative body of theory and research promoted the idea that scientific, professional and managerial employees remained a true “middle class” within the capitalist social relations of production. C. Wright Mills provided a cynical interpretation of the nature and power of the new occupations in the early 1950s. Mills, in his book *White collar: The American middle classes* (1951), returns to both Marx and Weber in charting the rise of what he perceives as a largely subservient group. He agreed that occupational growth had resulted from the growth in bureaucracies, changes in technology, and the increasing requirement of companies
to market the goods of industrial society. However, the work of those in the “middle class” was increasingly routinized and within the bureaucratic form these highly educated workers were discouraged from using independent judgment. Rather, decisions were made according to strict prescriptions. Ability to struggle against these conditions was inhibited by white-collar workers’ lack of organization and their dependency upon large bureaucracies, usually having little or no property or other income-generating asset beyond their skills.

Some thirty years later Ehrenreich and Ehrenreich (1979) found a “professional-managerial class” (PMC) operating between labour and capital. While not identical to Wright Mills’ almost wholly negative finding, and in contrast to Clément and Myles, the PMC nonetheless comprised "salaried mental workers who do not own the means of production and whose major function in the social division of labor may be described broadly as the reproduction of capitalist culture and capitalist class relations" (p. 12). Focused on the U.S., the Ehrenreich’s argued the power of the PMC was deeply dependent on the capitalist system and the federal and state governments (the latter dependent on taxes from capitalist growth). Simultaneously, however, the PMC was a powerful expression of the success of various occupational groups to control access to certain lucrative knowledge and activities (e.g., law, medicine, engineering), and represented a major cleavage of power in society.

Alvin Gouldner (1979) also emphasizes the contradictory nature of these middle occupations. These contradictions are the result of two factors: form and class location. In terms of who and what the new class is, Gouldner believed it to be
split between humanistic intellectuals and technical intelligentsia. In terms of location, the contradiction was based around their continuing subordination to the capitalist class, subordination brought about by that classes' lack of unity. In terms of potential to assume a dominant position, Gouldner focused on two phenomena. First, members of the new class were participants in a common culture of discourse or “speech community” that had the potential to break down intra-class divisions based on ideological differences. Second, the unification and subsequent ascendance of the new class might occur based on shared experiences within organizational life. Among a variety of conditions, Gouldner emphasized the blockage of their upward mobility. As the proportion of the highly educated increased, there will be more and more "blocked ascendants" and greater numbers of the new class would recognize their shared interests.

**Recent work in the Weberian “middle class” tradition.**

Weberian approaches to class, dominant through much of the latter twentieth century, produced a variety of prestige and status scales to measure occupational shifts (Langlois, 2002; Livingstone & Mangan, 1996; Savage, 2000). Others, like British researcher John Goldthorpe, sought to build detailed class maps that could account for assets like education and at the same time measure mobility patterns. For Goldthorpe (1992), with the rise of corporate ownership we have all essentially become employees enjoying differing amounts of advantage and disadvantage concerning conditions of employment, based primarily around market capacity. Goldthorpe lays out the following class scheme: service class (including professionals, administrators, and managers); routine non-manual workers; small
employers (with and without employees); farmers and other self-employed workers in primary production; skilled workers (technicians, supervisors, skilled manual); non-skilled workers; and agricultural labourers and other workers in primary production.

Goldthorpe’s schema is oriented around the structure of “authority” a worker is subject to, embodied in the type of contract—labour or service—they have with their employer. Those with a labour contract usually have a weaker market position and thus lower earnings. In his construction, however, Goldthorpe does not propose that the service class has escaped the hierarchy inherent to capitalist relations of production. If anything, the existence and welfare of the service class depends upon its administrative, managerial, and intellectual contributions to the efficient function of the bureaucratic organization. Goldthorpe, then, is theoretically and thematically similar in many ways the Ehrenreichs (1979) who proposed a needed but subservient professional-managerial class (see also Giddens, 1973, who, for a time at least, proposed a “new middle class”).

**Recent work in the Marxist “middle class” tradition.**

Nicos Poulantzas (1975), as a (relatively) committed Marxist, was struggling to account for the trend away from class polarization. Poulantzas, incorporating the idea that ownership had been separated from control in many modern

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47 More educated workers, professionals and managers, are advantaged and work under a service contract that offers better pay and benefits as well as “prospective elements” (1992, p. 42, italics in original) like salary increments on a formal scale, job security, (better) pensions, and, most of all, career opportunities via an internal labour market.
organizations, re-specified owners’ prerogative as “possession” by which he meant the capability to direct the means of production regardless of legal ownership. In advanced capitalist societies, those controlling the corporation were no longer shareholders, less frequently “owners” in the traditional sense, and more often managers. To remedy this shift while remaining “Marxist,” Poulantzas included managers within an expanded bourgeoisie, retained the old petty bourgeoisie and the proletariat, and inserted a “new petty bourgeoisie” composed of those performing basic supervisory and/or “non-material” or intellectual labour. These functions, for Poulantzas, meant that the new petty bourgeoisie could not be included in the proletariat, despite their not owning property. Poulantzas, to justify a new class within a Marxist framework despite it not owning property, argues that the structural determination of class is not purely on the social relations of production but depends as well on political and ideological power (see also Livingstone & Mangan, 1996; Pakulski & Waters, 1996; Wright, 1976).

In responding to Poulantzas, who proposed a “new petty bourgeoisie” composed of those performing basic supervisory and/or “non-material” or intellectual labour, neo-Marxist theorist Erik Olin Wright (1976) concluded that the contradictions experienced by professional and managerial employees were so pervasive and intense that attempts to draw distinct boundaries around a “new class” was largely a theoretical dead-end. Instead, Wright located educated, high status, and/or managerial employees on a continuum between the working class and owners. Wright’s concept of “contradictory class locations” allowed for fairly clear boundaries around disaggregated class fractions—occupational groupings like
semi-professionals, professionals, skilled manual workers, and so on—but his analysis led him to deny that any theoretically justifiable boundaries could be drawn around a new “middle” class. There was simply too much ambiguity in: the relationship of these workers to both the traditional working class and to owners and senior executives; their control over property and knowledge assets; and their carrying out of supervisory functions. Their interests, rather than clear, were contradictory and contingent and often altered by their experiences in the workplace.48

Wright endured heavy criticism from others in the Marxist tradition for his concept of contradictory class locations. His “contradictory class locations,” which recognized distinct class strata between the working class and the owner/executive elite but not a distinctive middle class, was argued to have slid too far into a Weberian preoccupation with authority rather than attending to the core Marxist concept of exploitation (Meiksins, 1989). Much of his subsequent career has been spent re-thinking the problem of the class, and particularly the notion of middle classes, and has gone through two identifiable periods. In the first, during the 1980s, Wright attempted to invest his notion of contradictory locations with a more fully

48 Depending on one’s occupation, according to Wright’s theory, interests are shaped by a complex mixture of: control over investments and resources; control over the physical means of production; control over the labour power of others; and varying legal control over assets, profit and labour based around the “private” system of property ownership (1976, p. 33). Wright, to illustrate his point, constructs a table where he indicates control, lack of control or ambiguity in each of the above categories, and finds that the experiences of control are very different, and often contradictory, for top managers, middle managers, forepersons, professionals, and so on. Each in their own way are pushed and pulled, sometimes jostled, between the poles of owner and proletariat, their objective alignment as ambiguous as their subjective identification.
articulated explanation of how exploitation fits within this model. The crux of this theorizing (Wright, 1990), based on Roemer’s analytical Marxism, is that exploitation can occur not just via ownership of property, but also through other assets like knowledge and skill. Wright has since shifted away from the idea that managers, experts and skilled labour “exploit” those who Wright calls “nonskilled.”49 I return to examine Wright’s work in more detail in Chapter Four, where I outline core concepts, operationalization of variables, and methods.

Conclusion

Each new class approach tells a certain story about the past, present and future of social relations within capitalist societies. The conclusions of each camp have been shaped by the type and scope of questions they ask, as well as the cultural mood, socio-economic conditions (Wuthnow & Shrum, 1983) and the types of technology (Barley & Kunda, 1992) appearing and/or dominating the historical period in which theorizing and/or research occurred. While assessments of the trajectories of a new class or class locations vary significantly, as described above, there is a strong similarity on two key issues: class is conceived as emerging from productive activities; and class is recognized as needing to differentiate among non-owners.

49 In his book, Class Counts (1997), Wright instead proposes a model where managers, experts and skilled labour are in a privileged position to make demands for loyalty and/or skill rents, but do not exploit per se. While Wright has moved away from explicitly defining his contradictory class locations based on authority, it has hardly disappeared from his model, which still views middle strata as facing significant, lived contradictions not faced by employees in working class positions.
While Marxist arguments on the new class tend to identify relations within production and Weberians and others tend to pay greater rhetorical attention to labour markets and labour capacity, this appears to be more an effort to distinguish theoretical origins. As the review of the various camps makes clear, nearly all the new, middle and no new-class theories root their identification of class in the labour process. That is, it isn't just that a worker is advantaged or disadvantaged in the labour market; for virtually all the theorists reviewed the key changes are: a) the increasing demand within the production processes for a growing variety of workers with specialized knowledge and; b) the role of managers vis-à-vis their power and interests in relation to owners and non-managerial workers.

On the second consensual point, there is widespread recognition that the capitalist-proletariat binary attributed to Marx (and still promoted by some orthodox Marxists) is simply not up to the task of explaining the nature of or direction of changes in advanced capitalist economies. Causing significantly more angst for those who consider themselves Marxists (relating to the “embarrassment of the middle classes”) than for those who don’t, nearly all have subtly or overtly recognized the value of Weber’s addition of skill differentiation to the owner/non-owner distinction, occupational closure and the ability to demand “rent” for scarce skills. As well, Weber’s attention to bureaucracy demarcates a pivotal unit of analysis for studying the increasingly complex division of labour and issues of domination and subordination that emerge within detailed hierarchies. But, simultaneously, there is a problem set up by Weber’s “market capacity” as it implies an almost limitless differentiation amongst non-owners. This recognition of difference, of course, is the
problem that most of the new class theorists are attempting to work out. How best to aggregate? Once occupations are aggregated, what are the interests of the class/class location? Are these interests antagonistic or complementary to other classes/class locations? In the chapter that follows I trace evidence emerging from direct study of the labour processes of specialists and managers, and from critical and mainstream work in the field of organizational studies. Such research suggests a range of trends that challenge many of the approaches to aggregation and class proposed by the new class analysts reviewed above.
Chapter Three – Class, Organization and the Labour Process

Introduction

Those in various new class camps share a common assumption: understanding the class location of specialists and managers depends on understanding their activity and influence within the division of labour. This is an important point of convergence. Yet many new class theorists converge as well in relying on static, generic occupational codes and/or educational attainment to test their theories. Some, and I emphasize the work of Erik Olin Wright here, have attempted to use more direct measures of what managers, specialists and technicians do and their relationships with employers, rather than depending solely on indirect proxies. Wright’s theorizing and research, particularly his early class schema, was heavily influenced by Harry Braverman’s early 1970s effort to connect the study of class to the labour process via Marxist theory. Braverman’s work inspired a relatively huge amount of theorizing and research on the relationship between on-the-ground relations of production and class. What became known as “labour process theory” has, however, generally veered away from large-scale class analysis and toward qualitative, small-scale studies linked only implicitly or not at all to the study of class.

In this chapter I review Braverman’s seminal contribution, with particular emphasis on his study of power, skill requirements and the supposed new class. I then look briefly at first- and second-wave labour process (LP) theorists and their contribution to understanding how variation and contingency can be incorporated
into a critical study of work and class. I follow by linking the work of those in the LP field to related disciplines like critical management studies and mainstream organizational theory, showing how an interdisciplinary approach to the study of the social relations of production and organizational variation enriches the study of class. I end the chapter by reviewing relevant qualitative and quantitative studies from the last two decades or so. My goal in this chapter is to establish a fuller conceptual and methodological context for my mixed-methods, interdisciplinary evaluation of knowledge class theories.

The Labour Process Debate

Harry Braverman’s 1974 book, *Labor and Monopoly Capital – The Degradation of Work in the Twentieth Century*, is credited with launching what became known as the labour process debate, out of which emerged labour process theory (LPT). Calling out the functionalism and management-orientation of mainstream organizational theory, as well as optimistic “new class” theorizing, Braverman carefully linked his reading of Marx to (then) contemporary trends and illustrated how the capitalist-logic of scientific management continued to permeate managerial approaches in industrial and service workplaces. Class, he theorized, was not a category or sector of employees, it was a dynamic, antagonistic relationship that manifests itself in capitalists’ (and their executive and managerial delegates’) need to control the labour process in order to centralize knowledge and thereby allow the division and simplification of tasks. The historical relationship between capitalists and workers was most visible in the processes and structure of
production, in particular the philosophy and tactics used by management to
maximize the efficiency of the labour process and maximize profits.

One of the results of this drive for profit, or valorization, was a gradual
decline in skill requirements. Rather than accepting current labour trends as
inevitable, or technological change as neutral, Braverman placed issues of
knowledge-control and profit that emerged from the social relations of production
squarely at the centre of transformations in skill requirements and organizational
structure. 50 Braverman was clear in his rejection of technological determinism;
despite the fact that machines were being used to replace workers, he argued that
the division of labour within capitalism could be analyzed before examining the role
of technology (Foster, 1994). In other words, new technologies evolve within the
labour process and are prone to management’s will via the asymmetrical power
inherent in capitalist workplaces. The drive for profit through efficiency, the
division of labour, the struggle between owner and worker – the social relations of
production – were changing the skill requirements of work, not technology or some
abstract evolutionary force. 51

50 One of Braverman’s enduring contributions was to “show how corporate structure and accumulation
strategies were integrally tied to micro-level strategies of control and exploitation” (Smith, 1994: 405).
51 David Noble, in his book Forces of Production – A Social History of Industrial Automation (1984),
draws a similar conclusion about capitalist relations of production. Against the backdrop of post-WWII
social and technical developments, Noble ties the fate of technical specialists to the United States’ move
into a permanent (cold)war economy that spent exponentially more monies on military research. With
the government funding vast amounts of research, yet allowing such research to remain in the hands of a
private corporate elite, scientific and technological development became enclosed within what Noble calls
the “military-industrial-educational-complex” (p. 20). Simultaneously, the impetus to automate was strong
for many industrial managers who: perceived a shortage of skilled workers; received substantial subsidies
to meet military or corporate performance specifications; had to compete with other firms in their field; and
Central to Braverman’s work was updating the analysis of the division of labour within the capitalist context. While he concluded a division of labour in societies is quite natural, Braverman finds that capitalism is the first system to carefully break individual jobs into specific operations. As Braverman describes, and directly echoing themes raised by Marx, “[w]hile the social division of labor subdivides society, the detailed division of labor subdivides humans” (1974: p. 51). Braverman concludes that the logic behind this perpetual drive to divide jobs lies in the idea that once the labour process is broken into simpler units, and the required skill to perform the work is reduced, labour power (i.e., workers) can be purchased more cheaply. Technical knowledge is then “distributed on a strict ‘need to know’ basis” (p. 57).

According to Braverman, the formalization of this drive to deskill could be traced back to Fredrick W. Taylor and the introduction of scientific management. Intrinsic to scientific management and other “rational system” (Barley & Kunda, 1992) managerial approaches were principles of centralization, rigid hierarchies, and formalized rules and behavioural expectations. To implement these principles, management depends directly on the knowledge possessed by workers. Scientific management functions, then, to:

[R]ender conscious and systematic, the formerly unconscious tendency of capitalist production. It was to ensure that as craft declined, the worker would sink to the level of general and undifferentiated labor power, faced an increasingly organized American labour force willing to protest (i.e., strike), and over which managers sought greater disciplinary power in relation to wages, layoffs, and the labour process.
adaptable to a large range of simple tasks, while as science grew, it would be concentrated in the hands of management. (p. 83)

Once management had possession of this knowledge it could be standardized and used to plan out each action of each worker, leading to the structured “separation of conception from execution” (p. 79). In scientific management, or Taylorism as it is often called, Braverman believed he had found the practical manifestation of capitalists’ desire to accelerate production through the division of labour.52

While Braverman tended to focus on the social relations of production in manufacturing sectors, he also had plenty to say on control in the service sectors. Describing what he calls the “scientific-technical revolution” (p. 151), management had shifted its sights to “grasping the process as a whole and controlling every element of it, without exception” (p. 171). The class-making processes like routinization and simplification that were an everyday reality of manual labour were increasingly becoming a part of mental labour, leading to an erasure of the distinction between workers’ experiences in the factory and the office. Contrary to many readings of Braverman, his claim was not one of absolute and linear deskilling; rather, he was pointing to a structural tendency within the capitalist mode of production. Capitalist organizations were constantly struggling to move planning and design into the hands of a small number of managers and “knowledge workers” in technical occupations. Wherever possible, “skilled” work, where

52 Scientific management as a practice seeks to quantify various tasks of a given job and thereby improve efficiency, isolating the exact time and sequence each task should take. Labor and Monopoly Capital asserted that scientific management formalized and embodied the general, primary force driving the removal of knowledge from workers and placing it in the hands of management.
conception and execution is fused, is broken apart into jobs where interchangeable workers simply executed what is prescribed by the technology they maintain.

Emerging from his study of the labour process, and linking directly to the new class theories from the previous chapter, Braverman argued that:

If we are to call this a “new middle class,” however, as many have done, we must do so with certain reservations. The old middle class occupied that position by virtue of its place outside the polar class structure; it possessed the attributes of neither capitalist nor worker; it played no direct role in the capital accumulation process, whether on one side or the other. This “new middle class”, by contrast, occupies its intermediate position not because it is outside the process of increasing capital, but because, as part of this process, it takes its characteristics from both sides. Not only does it receive its petty share of the prerogatives and rewards of capital, but it also bears the mark of the proletarian condition. (p. 281, italics in original)53

Braverman included among the new middle class a broad variety of middle management, technical specialists, forepersons, and the like.54 The researchers who followed Braverman’s lead had much less to say about the new class debate, which I believe was central to his work, instead tending to focus on the nature of management and the distribution of work-related skill. While I believe this decoupling with class analysis unfortunate, the theoretical and empirical work that emerged from the labour process debate is essential for a more direct and robust

53 This is the same quote used by Wright in his 1976 article on “contradictory class locations.”
54 Braverman’s middle class excluded top management and corporate executives and many of the “new” occupations that others were including within the knowledge class. In fact, Braverman argues that the number of workers with technical expertise and control over planning and design of the labour process was in fact far smaller than most estimates, with technical engineers, chemists, scientists, architects, draftsmen, designers, and technicians not amounting to more than three percent of the total labour force in 1970. Explaining this estimation, based on activity and not occupation, Braverman claims that specialized labour is constantly at risk of having their privilege removed by way of labour market competition and the centralization of specialized knowledge in management’s hands and a subsequent “rationalization” of their work. What had occurred during the first 70 years of the 20th century was in fact a polarisation in skill requirements, with a tiny fraction of workers ultimately responsible for conceiving and planning work.
understanding of the type of work and relations of power that exist among those in occupations demanding specialized knowledge.

**Labour Process Theory: Extensions and Critiques**

Braverman’s thesis on a broad trend towards work degradation evoked an immediate response, with research variously supporting, re-working, and rejecting his assertions. Theorists have argued over many aspects of and omissions in *Labor and Monopoly Capital*. Out of a range of shortcomings, including minimal attention to issues of gender and race/ethnicity in the labour process, I want to here introduce key theorists in the second “wave” of the labour process debate who made contributions on such topics as: subjectivity and class struggle; management strategies beyond Taylorism; and, closely related to the debate over management strategies, and dispute about changing skill requirements within and between occupational sectors (Meiksins, 1994; Smith, 1994; Wardell, 1999; Zimbalist, 1979).

While Braverman justified the exclusion of issues around subjectivity, others considered this an import omission.55 Michael Burawoy’s (1979) well-known work examined how management gained workers’ agreement to the conditions of

55 In the introduction to *Labor and Monopoly Capital* Braverman acknowledges that owners and managers were broadly aware of the wide-spread dissatisfaction among American workers of the day, and that many owners and managers had begun to adopt strategies like job rotation, work teams, profit-sharing, and other job enlargement and participation programs. Yet he dismissed these strategies as superficial, reintegrating two or three highly simple tasks at best and not changing the fundamental alienation (and exploitation) of workers. These sorts of comments reinforced the perception that Braverman saw only a deterministic, linear model where capitalists had or were rapidly gathering the power to control all aspects of work processes and organization. Smith (1994) sees in Braverman more than a simple omission regarding workers’ agency and their subjective experiences: “it was a conceptual blindness to the possibility that workers could reshape, appropriate, and temper modes of managerial control” (p. 406). While it is doubtful that Braverman was not concerned with the agency and struggle of workers, considering his experience in the trades, he inadvertently portrayed a labour process where workers are passive and ignored the active struggles, victories, and cooperation that shape relationships and processes of production.
production and how “manufacturing consent” was a key factor in maintaining work relations within an organization. The issue of consent was, in many ways, the elephant in the Marxist room that not many wanted to talk about. Burawoy conducted intense ethnographic analysis searching for an explanation of consent that could be fit into the debate on labour process without undermining Marxian logic. He proposed that consent is built on two phenomena relating to workers’ discretion. The first involves the degree to which organizations provide employees with a sense they have choice in their work. The second involves workers’ own attempts to empower themselves, creating games in which they would beat their employers. The labour process, from such a vantage point, is negotiated and often reflects an anti-managerial but not anti-capitalist form of worker resistance (see also Smith, 1994; Meiksins, 1994).

Besides Burawoy, other early important contributions examined Braverman’s (perceived) claims that: all jobs were or could be routinized, that all management systems were essentially the same, and that workplaces were always and inherently structured by the interests of management. Andrew Friedman (1977), in an act of constructive criticism, finds that overt, oppressive subordination

56 Burawoy described this phenomenon as “making out”. However, Burawoy looked upon “consent” in the workplace as something akin to false consciousness:

[U]nder monopoly capitalism the individual psyche is stripped of its capacity to resist the structures of capitalist domination. The family no longer nurtures the rebellious and independent individual of early capitalism. Instead, people are directly shaped by and subjugated to broader institutions: the mass media, the culture industry, and so on. The arena of subjectivity, of conscious resistance to domination, disappears, giving way to the individual as a mere object of manipulation. Monopoly capitalism has managed to shape our very character in accordance with its rationality. (p. 201)
is not universal; rather, some workers in both blue- and white-collar work are granted or win “responsible autonomy,” a form of control that extends to employees a level of trust in order to take advantage of their adaptability and creativity, as long as they meet the expectations of management, whether this is production quotas or bureaucratic efficiency. Responsible autonomy exists on a spectrum with “direct control,” the latter thought by many to have been universalized by Braverman. This autonomy is not simply rhetorical, a façade covering the principles of scientific management as Braverman believed (see also Kitay, 1997). Rather, workers are encouraged to solve problems but within the norms and rules of their organization. Sometimes this autonomy emerges from the conditions of the job, where tasks include a high degree of uncertainty or present problems for surveillance, but other time responsible autonomy emerges from, or in conjunction with, employee resistance to direct control. Friedman argues that Braverman and other neo-Marxists failed to “appreciate the importance of worker resistance as a force provoking accommodating changes in the mode of production” (p. 7).

In a different vein, Richard Edwards (1979) sought to provide a more historically nuanced analysis of managerial strategies and trends. The structures of control had transitioned at the end of the 19th century from a “simple” control based around personal relationships in small firms to “technical” control centred on designing technology and work flow so as to reduce labour. By homogenizing

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57 This is an insight that drives much of the theorizing by those linked to autonomia (or “autonomist Marxism”) movement (Dyer-Witherford, 1999). See also Edwards’ similar proposal in the following paragraph.
workers, however, technical control created a basis for shared struggle and more effective organization. Edwards proposed that after World War II “bureaucratic” control had superseded both simple and technical control approaches, superior for instilling in workers, especially office workers, self-discipline and identification with their firm. Edwards believed that the working class was separated based on the different forms of control they were subjected to. Simple control usually involved those with less formal education and offered lower wages and less security. The traditional “proletariat,” found mainly in manufacturing and extraction, were subject to technical control; and the middle layers (technicians, professionals, supervisors, etc.) to bureaucratic control. Workers, in this complex arrangement, tend to see other fractions of the working class as their primary opponents in their struggles, instead of the capitalist class.

Tessa Morris-Suzuki, in her article *Robots and Capitalism* (1984), uses an analysis of the effects of software in the factory to support a deeply pessimistic analysis of the impact of computers in white-collar organizations. Software allowed the development of “flexible manufacturing systems” but, at the same time, by removing knowledge from the body of the worker, the commodification of productive knowledge was greatly enabled. This churning out of knowledge could

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58 Whereas technical control had spread from manufacturing into service work, bureaucratic control had done the reverse. In each system of control, however, conflict and struggle could not be entirely subdued.

59 In computers, argues Morris-Suzuki, management suddenly had the opportunity to separate hardware from software, the result of which was a "revolutionary fission of the labour process itself" (p. 112). Morris-Suzuki argues that the widespread automation of manufacturing during the 1970s constituted a radical departure from the past. Up until that time, knowledge was a significant aspect of production but was largely embodied either in worker or machine. In Morris-Suzuki’s analysis, the results were already
be directly linked to the ever-present competitive pressures in the capitalist mode of production that pushed in the direction of innovation. The result of this pressure is creating what Morris-Suzuki described as the “Perpetual Innovation Economy” (p. 114) in all economic sectors. The capitalist system remains the same for the most part; the fundamental difference is the pace of change and the intensified attention to knowledge production, management and protection. The same pressures leading to innovation elsewhere are building within organizations that depend on what can generally be described as “intellectual labour”, or “white collar” work. Similar to Cooley (1980), who wrote about the “deskiller deskilled” in relation to the fragmentation of intellectual labour by computers, Morris-Suzuki (1984) writes:

[T]he commodity production of knowledge has become more central to corporate profit-making, so the urge to improve the efficiency of workers in this field has led to an increasingly fine division of labour, and to the growing fragmentation and routinisation of tasks. Here the complex information network and database systems play a role in some ways comparable to the role of the conveyor belt in factory production. They make possible the breaking down of previously complex integrated tasks into a series of small, visible. Fewer and fewer workers engaged in productive manual labour, while information had “become a commodity churned out by corporate enterprises almost as routinely and monotonously as cars flowing from an assembly line” (p. 114). In contrast, Zuboff (1984) presents a well-known and much more optimistic position that information technology (IT) could radically improve work conditions given the chance, through what she calls its inherent capability to “informate”. Where traditional machines simply perform their task, or “automate”, Zuboff claimed that IT possesses a reflexive capability, reporting back on the work that has been done and thereby generating new types and quantities of information. This optimism leads Zuboff to be highly critical of the hierarchy and division of labour common to capitalist organizations, claiming they will only be profitable if they devolve control and mine workers’ knowledge, and that “learning is the new form of labor” (p. 395). Yet, despite the inherent properties she sees in new (at the time) technologies, she did not deny that IT is subject to market pressures and human decisions. Zuboff acknowledges that information technology has and can be used to further deskill workers and “displace the human presence” through automation of the labour process. She also admits there is no guarantee the potential of informating technologies will be realized: “[the] new scenario calls into question both the forms of knowledge that people need and the way in which that knowledge should be distributed. New intellective skills are required, but the mere fact of this requirement does not imply that it will be fulfilled” (p. 172).
isolated components which can be performed by less skilled workers. (p. 118)

The result is not workers who possess less skill, since educational attainment is steadily increasing. Rather, Morris-Suzuki argued that the result is more and more graduates who don’t have the opportunity to apply their “high skill” in “low skill” occupations.\textsuperscript{60} This problem would not affect just lower level technical and sales staff, but more prestigious, more autonomous occupations as well like engineers, architects, and scientists. The effect of various managerial strategies to reduce skill would be uneven and contingent, but still stratified: "The mass production of knowledge does not result in the equal de-skilling of all jobs. Some, in spite of intensive computerisation, continue to require individual judgment and initiative. What emerges, therefore, is a hierarchy of knowledge-producing occupations..." (p. 119; italics added for emphasis).

While Edwards and Freidman contributed a more nuanced understanding of variation in managerial strategies, their work generally homogenized the labour experience of specialists and managers (and those in routine jobs). What Morris-Suzuki contributes is an early example for appreciation within LP theory for the difference among specialists and managers, further undercutting the neat, sweeping generalizations about a relatively homogenous knowledge class. The process of

\textsuperscript{60} More generally, the very real risk of automation in both manufacturing and services is the amplification of massive international inequalities of wealth. Automation, for Morris-Suzuki, accentuates a "central paradox of capitalism—that is, the gap between technology increasing the potential to liberate people from suffering, isolation and boredom and the reality of continuing human bondage to dehumanising social and economic systems" (p. 121).
problematizing high-level class analysis continued in the second-wave of LP theory. Second-wave LP theorists modified and extended Burawoy’s work in bringing greater attention to issues of subjectivity and agency. Others sought to explore issues that pertain directly to the technological and economic determinism that permeates so much of the new class theorizing.

**Broad Conceptual Rethinking of the Labour Process.**

A number of “second wave” labour process theorists attempted to rectify this shortcoming, and provide a more sophisticated picture of the capitalist labour process. While Burawoy, Friedman and others were still concerned with the labour process as it related to class power, and oriented to a more or less positivist ontology, the issue of subjectivity and resistance within the labour process debate has in many ways taken a post-structuralist, Foucauldian-inspired turn that significantly dulls the realist, radical edge that permeated Braverman’s original analysis and the work of most in the early labour process theorists. At the same time that postmodern theorists have drifted away from the debate’s critical-realist roots—and in the face of theoretical fragmentation (see Kitay, 1997), claims of conceptual exhaustion (Storey, 1985), and feared irrelevance—attempts to update LPT have been made by theorists more sympathetic to Braverman’s original analysis (Tinker, 2002).61 These efforts, while less challenging ontologically and

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61 Tinker argues that the post-structuralist preoccupation with, among other things, dualism, uncertainty, introspection, and deconstruction misses the overtly political and nuanced argument made in *Labor and Monopoly Capital.*
generally looking to build LPT rather than deconstruct it, are no less pointed in their critique of Braverman.

Like the new class debate, the labour process debate has waned in intensity and participation; however, its legacy—and those who still continue to research the connection among organizational form, skill requirements and critical analysis of capitalism—present critical theories and compelling research that are frequently missing from mainstream discourse regarding the trajectory of work, capitalism, and role and class location of specialized labour. Linking control with contingency, Paul Thompson (1989) proposed a “core” labour process agenda around which researchers in that discipline could rally. Thompson’s core theory rejects Marxist teleology and the labour theory of value but affirms: the centrality of the labour process for understanding and challenging the capitalist system; structured antagonisms; the need for constant renewal and change among profit-seeking firms; and a control imperative on the part of firms in order to ensure profitability.

Thompson proposes, like others (see Cohen, 1987)\(^{62}\) that management will use

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\(^{62}\) Cohen (1987), in trying to find some common ground with Burawoy, Friedman and Edwards yet at the same time defend Braverman’s strong critique of capitalist strategies, believes the pre-occupation with “control” critiqued by “second-wave” labour process theorists both led to and emanated from a misreading of Labour and Monopoly Capital. Instead, “Braverman’s primary concern is not with ‘control’ or even deskilling per se, but with the specifically capitalist logic which constructs these tendencies” (p. 36, italics in original). This capitalist logic, according to Cohen, makes it impossible to separate the process of production from the creation of profit. In that the “objective of valorization [i.e., profit or surplus value]…is what fundamentally structures the whole nature and organization of the capitalist labour process” (p. 36), Cohen argues that management is not looking to subordinate workers in some societal power struggle but is rather taking whatever efficiency-oriented actions are necessary to ensure profitability. Within this “contingent” framework, Cohen is not arguing that the labour process is unimportant; on the contrary, she believes that any critical understanding of class-based struggle must be rooted in an analysis of workers’ resistance to exploitation, whether that resistance centres around localized
whatever is at its disposal to increase profit, and sometimes what is at their disposal is not the most efficient in an absolute sense (as if management possessed absolute control over labour and the design of productive technology) but the most efficient based on the power of various occupational groups, available technology, the historically situated intensity of class struggle, and so on. In this way, and similar to Choi et al.’s finding presented above, if autonomy and involvement for specialized high-wage employees will likely lead to the greatest profit, then that’s the path management will choose.

In contrast to Thompson and others, who seek to strengthen and reinvigorate labour process research by moving away from the teleology they perceive in Marx’s historical materialism, Paul Adler (2007a) has proposed a “paleo-Marxist” approach as the most effective for studying current trends in skill and the labour process. Identified in Chapter Two in the “New but (Working) Class” camp, Adler believes that Braverman and other neo-Marxists/orthodox labour process theorists have missed or ignored the fundamental contradiction that Marx saw between the persistence of capitalist relations of production (profit maximization or valorization) and the socialization of the labour process. Adler argues that capitalist organizations, in search for greater productivity and in expanding commodity markets, inadvertently “socialize” the forces of production, with issues such as pay, labour intensification, and management control or more global issues of social transformation.

63 The “paleo” in paleo-Marxist is, for Adler, suggestive of this “recovery” of an early 20th century reading of Marx that focused on capitalists’ compulsion to socialize labour.
workers drawn into greater interdependence by capital and where the collective intellectual capacity of workers is more and more depended on increase productivity.

Adler (2006a) presents a contrarian argument against LPT’s preoccupation with control/autonomy. He argues that:

Autonomy/control theories assume that this interdependence typically takes an asymmetrical form, in other words, that autonomy is replaced by dependence and domination. But this assumption needs to be tested against reality, since it is possible that autonomy is replaced by a more congenial, symmetrical, and collaborative form of interdependence — one that might be experienced very differently by employees. (p. 203)

Deskilling may occur temporarily, and older forms of work are subsumed, but Adler remains confident that the long-term trend is toward broader work relations, more complex tasks, and a growing sense of global solidarity among workers. Adler (2007) admits that the process of socialization is “simultaneously stimulated, retarded, and distorted” (p. 1324) by profit-maximizing imperatives, but generally work is not “degraded” and workers are not left in a situation where they revolt because they have nothing more to lose. The actions of capitalists, in search of profit, lead to increasing interdependence and increasingly sophisticated technology, and interact to create a situation where, for workers, the “overall, long-term, aggregate effect...is to foster upgrading: greater intellectual sophistication, broader
worldviews, and sharpened expectations of justice” (Adler, 2007a, p. 8; see also P. Sawchuk, 2008).64

Extending his argument from technical skill to relationships and control, in other work Adler (2001) proposes that the knowledge-intensity of productive activities is leading to greater reliance on trust and community as an organizing principle, in contrast to market-based discipline or hierarchical authority. These approaches are not exclusive, however; rather, Adler perceives the structure of management operating in all three of these dimensions with greater emphasis given to one or the other based on knowledge-intensity and the core business of the organization. Sometimes all three appear at once. In this combined way, and building off the related, mid-twentieth century work of Gouldner and Blau, Adler perceives the emergence of what he calls “enabling bureaucracy.” This form of organizing combines high levels of bureaucratic structuring with high levels of community trust (2006a). This trust is a modern one, though, different than traditional trust that privileged loyalty above all else. The modern, “reflective” trust is oriented towards integrity and competence, strengthening localized, particular relationships through appeal to universal, scientific principles of fairness and professional scepticism.

64 Sawchuk writes that “[w]hat becomes clear […] is that up-skilling must be understood in a dual sense, as including both those skills that management hopes for and legitimizes through skill/competency orientations, and the wide variety of ‘skills’ and ‘competencies’ (e.g. of disengagement, resistance, class consciousness, labour organizing, sabotage, etc.) that it does not” (p. 54).
Adler’s work engages not only more critical fields like class analysis and labour process theory but more mainstream disciplines like management studies and organizational theory. In doing so, his theorizing engages directly with notions of post-bureaucracy, knowledge-intensive organizations, knowledge management, and a host of complex, nuanced theories around the structure and dynamism of organizations. Such fields and theories often reflect rhetoric more than practice (see Barley & Kunda, 1992) but are important nonetheless for their ability to provide typologies (even if “ideal” in nature) for studying the organizations and strategies that specialists, managers and other employees work in. While fields like mainstream organizational theory have relatively little to say about power and history of how such organizational forms came to be, such typologies reflect the culmination of the work managers and specialists (especially engineers and IT workers) outlined in Chapter One who have been central to remaking the labour process in a way that often legitimizes and perpetuates their privilege.

**Contributions from (Critical) Management Studies and Organizational Theory**

Within advanced capitalist economies, the huge majority of working people are employees within some sort of organization, be it public or private. Such organizations vary by size, structure, purpose, level of competition, industry and so on. For workers, managers and owners, relations change depending on occupation, skill requirements, form of control/degree of discretion, career opportunities, and interaction with other employees and customers. There is no perfect map for such variation, and not all issues/concepts are directly relevant to the question of a new class existence and power. The history of the study of organizations is vast and
beyond the scope of this review, and I will keep my review high-level and targeted to relevant themes. Broadly, (modernist) organizational theory can be broken into three main phases: 1) the study of formal aspects of organization, as in Weber’s work; 2) organizations as systems; and 3) organizations as contingent structures reacting to internal and external stimuli.\textsuperscript{65} I have already reviewed Weber’s contributions in Chapter Two, which emphasized formal structures and impersonal rules within bureaucracies. Talcott Parsons and other functionalists have tended to portray organizations as part of systems, often naturalizing asymmetrical power and the division of labour according to equilibrium models. A shift toward uncertainty, contingency and various external factors began to gain traction in the 1960s, and this “open system” approach largely dominates organizational theory currently.

In terms of tracking trends, one well-known if simplistic metaphoric dichotomy is between “mechanistic” and “organic” organization. The former stresses predictability and accountability, the latter flexibility, adaptability and innovation (Hatch & Cunliffe, 2006).\textsuperscript{66} Compatible with such a metaphor, the well-known early-1960s Aston project in England sought to create a more precise and

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\textsuperscript{65} Various strands of symbolic-interactionist and postmodern research have challenged these ontological assumptions, and led to greater attention to the importance of subjectivity, identity and cultural norms within organizations and as catalysts for change. As well, and perhaps in response, organizational theory has begun to incorporate some aspects of complexity theory to help better explain why the structure(s) or organizations are contingent (Hatch & Cunliffe, 2006).
\textsuperscript{66} Mechanistic organizational structures are akin to machines where the features—high formalization of rules, centralization, standardization of action, close supervision and clear hierarchy—make it less able to adapt. Organic structures exhibit authority based on knowledge and merit, low formalization, decentralization, dialogue over rules, low supervision and lateral, self-directed interaction between departments. Mechanistic organizations thrive in stable environments, organic in unstable environments
\end{flushleft}
empirically testable set of variables by which organizations could be compared. Still relevant to the field, the project proposed that contextual factors include: a) the origin and *history* of the organization; b) *ownership*; c) *size*; d) *charter* (or purpose); e) *technology* (dominant tools and techniques for achieving goal); f) *location* (local, national, international); g) *resources* (human, ideational, financial and material); and h) *interdependence* (relationship with other organizations). If these are thought of as the “independent” variables, the “dependent” variables constructed included: a) *specialization* (degree in the division of labour); b) *standardization* (of both roles and procedures); c) *formalization* (based on source, legal or arbitrary, and degree to which procedures are written down and filed); d) *centralization* (of strategic organizational decision-making based on ownership and/or expertise); and e) *configuration* (measuring the extent to which the organization is vertical or flat) (Clegg & Dunkerley, 1980). This array of variables is useful (if contested) in highlighting the ways in which organizations vary.

A similar but more historically specific typology is offered by Frenkel et al. (1999), who survey literature from the fields of labour process theory, organizational theory, and industrial relations, and develop a matrix of features for

67 Compare with Edwards’ (1979) attempts in the late seventies to add nuance to Braverman’s perceived narrow fixation on rational (scientific) management techniques. These led Edwards to identify three features of “systems of control” that needed to be coordinated: 1) direction, the methods by which the employer defines the precision and time of tasks; 2) evaluation, the procedure by which management assesses adequate and inadequate performance; and 3) discipline, the means used to ensure cooperation and enforce compliance with the capitalist’s directions.
three ideal types of work organization, including: bureaucratic, entrepreneurial, and knowledge-intensive. In seeking to delineate the organizations, they identify three main “relations” by which these ideal types vary. The first is *work relations*, involving how tightly work roles are defined and the types of competencies (knowledge, skill, creativity) required. The second is *vertical relations*, involving: a) employment relations like reward systems and career opportunities; and b) control relations related to how hierarchical or collegial the workplace is, the extent of discretion offered to employees, and forms of control (including direct, output, and peer- or self-control akin to responsible. The third variation is *lateral relations*, involving: a) co-worker relations with immediate colleagues and with workers in other areas of the organization; and b) customer relations, distinguishing the extent to which an employee is a neutral service provider or is more deeply involved (“affectively positive interpreter”) and the extent to which the encounter is directed by management or complex interdependencies (“triangular relations”). While bureaucratic organizations tend to be hierarchical and rigid, entrepreneurial organizations depend on markets and

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68 Their ideal types result from their focus on front-line service workers, thus leaving out extractive and manufacturing organizations.
70 The work relations in *bureaucratic* organizations involve defined positions and competencies tend to be narrow, involving contextual knowledge that is action-centred. Vertical relations are characterized by reward systems that emphasize pay related to seniority and internal labour markets. Bureaucracies are hierarchical and employee discretion is limited by rules and direct oversight. Lateral relations with immediate co-workers are both individualized and interdependent, while tasks are passed off across stable boundaries to other workers. Those who work with customers are expected to be neutral and reactive, often working from pre-established rules or scripts.
incentives\textsuperscript{71} and knowledge-intensive organizations have high levels of specialization, fluid boundaries, and high autonomy.\textsuperscript{72}

\textbf{Continuity and Change.}

Theories regarding organizations were in the 1950s dominated by a relatively static “closed systems” approach where managers focused on the internal operations. Since then, approaches like contingency theory, resource dependency theory, and a host of others have led to much greater attention to external factors impacting decisions on organizational structure, including networks of businesses and individuals, international competition, and the rate of change in a given industry (Hatch & Cunliffe, 2006) and near perpetual restructuring.\textsuperscript{73} More recently, approaches promoting “learning organizations” and “knowledge management” have

71 The work relations in \textit{entrepreneurial} organizations involve positions and competencies dictated by market needs. Vertical relations are characterized by reward systems that are highly variable, often related to performance, and workers are often brought in on contract. Such organizations tend towards high discretion and surveillance is primarily achieved via output monitoring. Lateral relations with immediate coworkers are primarily individualized, and significant tension emerges where the contract employee is dependent on other employees for material, information, or task completion. Those who work with customers are frequently expected to take an instrumental lead in solving an issue and must liaise with clients and management.

72 The work relations in \textit{knowledge-intensive} organizations involve occupational specialization and fluid application. Competencies are broad, and combine social and interpersonal skills with analytical skills that depend on abstract and contextual knowledge. Vertical relations are characterized by reward systems that are somewhat variable, sometimes related to performance, and employees are pulled from both internal and external labour markets, making career mobility complex. Such organizations tend toward collegial networks, with high task-level discretion and relatively high involvement in departmental and/or organizational goal setting. Control is achieved primarily through peer norms and self-direction, with elements of professional oversight sometimes combined with managerial observation and review. Lateral relations with immediate coworkers are frequently team-based with high levels of interdependence, and employees in various specialisms are expected to work closely in teams with others. Those who work with customers are frequently expected to take an instrumental lead and be an advocate for (“affectively positive”) in advising clients, and must liaise with clients and management in successfully completing projects.

73 Restructuring can cover a range of alterations, including: how a company’s finances and debts are organized; departmental and/or divisional changes; and/or operational changes that include new technologies, modifications to existing production or service delivery, and new supply or distribution arrangements.
gained favour but they, like the predecessors, are oriented to the broad changes in competition, pace of change, and complexity brought about by: 1) neoliberal ideals of trade liberalization, market deregulation (or reregulation), and the deconstruction of corporatist arrangements among private companies, labour and government; and 2) the increasing complexity of products, production and services as the scientific-technical knowledge base expands (McKinlay, 2002). Innovation and restructuring has become *de rigueur* for senior corporate executives, has led to rapid expansion of special “change management” strategies, and has provided many new opportunities for those who can contribute to successful restructuring. In such a context, there is significant evidence of the power gained by specialists who contribute the knowledge that allows organizations to be dynamic, be it through research and development, the development of new policies, or the better use of human resources. But to assume that the privilege enjoyed by specialists is not susceptible to the same forces that provided such privilege and power is to ignore the varied outcomes of restructuring.

**Specialists, Managers, and Organizational Change.**

Managers and specialists have historically been at heart of the “creative destruction” that characterizes capitalist economies, economic growth, and organizational restructuring. Such changes are very frequently centred on incorporating new technologies, reducing labour, and/or finding more efficient procedures for the workers who remain. The need for capitalist production to remain highly dynamic has meant that the specialists who effect restructuring of the labour process are potentially in a privileged position, able to use their “asset
specificity” to demand what are described as “rents” (Sørensen, 2005). In the context of labour, asset specificity defines a situation where the knowledge or technique possessed by a worker is context-specific, was gained through expensive training, and/or is scarce and the “transaction” cost of replacing or routinizing an individual or group is thus not worth it for an organization. Such assets are thus durable but not permanent. Sometimes the asset specificity is individual in nature, relating to professional or client networks, to patents held by an employee, or some not easily measured trait or knowledge. Other times it is collective, as in the transaction costs of firing all public teachers and replacing them with less qualified but unorganized educators.74

**Asset Specificity and Rents.**

Asset specificity is used to explain composite rents (Sørensen, 2000a),75 where there is a joint advantage to employer and employee to maintain the relationship and where the worker’s specific knowledge and the organization’s investment in the worker mean greater wealth can be created for both parties if they continue the employment relationship. Such composite rents tend to involve managers and specialists. The “rent” or wealth generated from the relationship is contested, and within the cooperative arrangement there exist antagonistic interests. The ability to generate scarcity through closure or credential significantly

74 As then-US President Ronald Reagan proved in firing all U.S. air-traffic controllers in 1981, sometimes ideology and class struggle can trump transaction costs.
75 Sørensen uses assets and rents generated from them as a basis for his rethinking of exploitation. I review this approach in Chapter Four in the context of developing my theory of class. I return to rents and exploitation most fully in Chapter Eight, my Discussion.
boosts the employee’s (or occupation’s) ability to claim larger portions of the composite rent. There are various ways employers try to increase their share of the rent, including intensifying supervision, seeking out a more productive worker, or building incentives into the employment contract. But the very existence of a composite rent makes the employer more dependent on the employee and therefore less flexible. This constraint on flexibility can be a major disadvantage for employers seeking to build their ability and reputation for quick responsiveness in the global economy. The employer, instead of just increasing their share of the composite rent, can seek to destroy the composite rent via technological or organizational innovation, thereby removing the need to share any rent and potentially increasing profit overall through lowered labour costs and greater efficiency. The idea of composite rents helps to explain why employers will seek to deskill the labour force when it can, for it reduces the employees’ ability to argue for a greater share of the profit. It also provides an explanation that bridges classical economic theory and more critical approaches for why specialists and managers may be experiencing intensified surveillance, attacks on the closure they have achieved (e.g., teachers), and potentially decreased power over specific and general workplace decisions. Conversely, asset specificity can also explain why employers may not challenge the division of labour and occupational closure that perpetuates composite rents.

**Contemporary Evidence**

Too often rhetoric and theory are conflated with empirical findings, or the former stands in for the latter. Conversely, proxies like occupational composition, ICT use and R&D are used to draw conclusions about other factors like skill or
relational aspects like power (Warhurst & Thompson, 2012), and feed many of the uncritical theories of a knowledge-based economy. In this section I review empirical evidence that begins to critically evaluate some of the knowledge class, labour process and organizational theories reviewed so far. I begin by looking at contemporary qualitative studies before turning to quantitative survey data, where I examine debates around how best to operationalize and measure skill, decision-making and general aspects of the social relations of production. The research crosses disciplinary boundaries but tends to be linked to those affiliated with labour process theory and the debates on skill that have emerged out of it.

**Qualitative Studies of Managers and Specialists.**

Those conducting studies of knowledge-intensive organizations—critical or otherwise—have begun to identify a range of practices that suggest specialists are experiencing significant, and perhaps increasing, pressures to increase their individual and collective productivity. This includes basic business operations monitoring like sales analysis, job tracking, or inventory control (Rule & Brantley, 1992) as well as “social” surveillance of email content, websites visited, and computer activity. Both kinds of pressures have invaded the world of professionals, managers, and technical workers, just as they have administrative employees and other support workers in bureaucratic, service-based environments. Other social forms of surveillance such as peer-based discipline are less often mentioned, but are gaining increasing attention. I begin by describing broad changes in the labour markets for many specialists, driven largely by employers’ desire for greater flexibility and advances in workflow technology and software that infringes onto
some specialists’ (and some managers’) decision-making. In the context of global labour markets, efforts to elicit greater effort from specialists is leading to familiar and unfamiliar managerial strategies.

**Flexibility.**

One of the earliest noted trends in neoliberal restructuring of Western economies was the rising frequency with which organizations were adopting “flexible” work practices. Such flexibility can be separated into two main approaches: numerical and functional. The former refers to the ability of an organization to rapidly increase or decrease the number of employees. The desire for this type of flexibility has led to the breakdown of the permanent employment model and the rise of contingent or “precarious” work (Community-University Research Alliance on Precarious Employment, 2005; Cranford, Vosko, & Zukewich, 2003). Functional flexibility focuses on multi-skilling individual workers through training programs as well as seeking socialized, network arrangements that foster collaboration and the sharing of expertise (Meiksins & Whalley, 2001; Smith, 1997).

These two forms of flexibility have, separately and together, affected not just industrial or routine service work; it has impacted the professionals, managers, and technical workers usually grouped into the “knowledge class.” As described in Chapter One, a significant shift occurred in the twentieth century where self-employed professionals like doctors and engineers entered into employment within the corporate world; others, like the human resource profession, were born within the corporate framework (Brint, 1994). The shift was part of a broader societal shift away from expectations of professionals as “social trustees” and towards “expert
professionalism” (Brint, 1994), or what Derber (1990) describes as “occupational” professionalism.

Despite the expansion of “corporate” experts, Meiksins and Whalley (2001) have studied the U.S. “high-tech” industry and found that the composition of the workforce has been shifting from full-time and salaried professional and technical employees to part-time, temporary, or contract employees. In these unstable situations, technical and professional workers feel immense pressure to exceed expectations in order to gain favourable standing and future work (see also Ó Riain, 2001). As well, both permanent and contract professional and technical workers now labour more often within non-standard work schedules, where extra, unremunerated working hours are added (Lehndorff & Voss-Dahm, 2005; Rikowski, 2004) via on-call requirements and mobile technologies like cell-phones and portable computers. Grugulis (2003) finds that companies, rather than seeking organizational collaboration or the building of employee skills, are more commonly seeking flexibility through subcontracting and outsourcing. These latter two approaches correspond to what Lehndorff and Voss-Dahm (2005) call “external” flexibility (p. 291), involving the outsourcing of: 1) working time (subcontracting, temporary contracts); and 2) competences (networks through other companies). This externalization of professional and technical (and sometimes managerial) work cultivates a market environment, even within firms, as employees know that only performance results in security.

This external flexibility has, with the advent of instantaneous digital networks, meant that competition for professional, technical and creative jobs has
gone international (Castells, 1996; Huws, 2003). No longer the concern of just the auto-worker or the call-centre employee, now graphic designers, programmers, architects, music producers, writers, educators, and so on must worry whether their job will be relocated to Beijing or Mumbai. This ability to centralize control over a geographically diffuse, complex labour process has led to familiar patterns of geopolitical and regional power, with corporate headquarters in large urban areas like New York, London, Singapore, Tokyo and others that Manuel Castells (1996) has described as “hubs” of the global network society. Hardt and Negri (2000) describe this as the “deterritorialization of production” (p. 295), where spatial boundaries are broken down and the need to bring workers into close proximity or under centralized watch fades. This, in combination with the increased mobility of capital and its ability to simply “withdraw” from labour negotiations, has undermined the bargaining power of all workers.

The ability of companies to move not only production but also services offshore is also considered revolutionary by Alan Blinder, a former senior economic advisor to the United States government. Blinder (2006), similar to Robert Reich’s influential argument in *The Work of Nations* (1991) reviewed in Chapter Two, posits that the only safe jobs are service jobs that necessitate physical proximity: everything else—low and high skill—can and most likely will be outsourced to regions where technical skills are high and wages are low. The jobs left will be primarily lower paying service occupations that depend on face-to-face contact (e.g., beautician) or personal intimacy and trust (e.g., psychologist). Relatedly, the US Bureau of Labor Statistics has released data showing that real wages are stagnating,
jobs in science and engineering are not growing, and five of the top-ten fastest growing jobs in the US are designated “very low” income (Meyerson, 2006).

With reduced bargaining power and no professional control, in the classic sense of control over access to the occupation, many in jobs where work is shepherded electronically can provide little resistance to technological “solutions” often imposed from above by outside experts. The actual tools used to outsource service-oriented labour is usually referred to as back-room software (Baldoz, et al., 2001) or work-flow software (Friedman, 2005) and has the potential to not just relocate a single job, but to fragment a task like software design into chunks that can be emailed anywhere in the world while being coordinated and synthesized in a central location (Sharpe, 2001). New York Times journalist Thomas Friedman, in celebrating more equitable international competition in his book The World is Flat (2005), relates the excitement that owners feel with this increased flexibility:

“Work flow platforms are enabling us to do for the service industry what Henry Ford did for manufacturing,” said Jerry Rao, the entrepreneur doing accounting work for Americans in India. “We are taking apart each task and sending it around to whomever can do it best, and because we are doing it in a virtual environment, people need not be physically adjacent to each other, and then we are reassembling all the pieces back together at headquarters [or some other remote site]. This is not a trivial revolution. This is a major one.” (p. 80)

Such a situation, while certainly increasing the mobility of capital and potentially redistributing wealth away from its current concentration in developed Western nations, does not seem particularly desirable for skilled workers anywhere. In the short term, the worker in India may enjoy high relative pay and much better working conditions compared to other workers in India. However, this increased
mobility of capital means there is little preventing transnational companies from jumping to the next country when labour costs in India begin to increase.

Specific data on offshoring and outsourcing are difficult to come by, mostly based on issues of how such practices are or could be measured. What Canadian data exist suggest the offshoring phenomenon is mixed. The best available evidence (J.R. Baldwin & Gu, 2008) shows that, so far at least, offshoring of occupations in services where specialists are usually found has had no effect on employment. However, the offshoring of services has a negative relationship with wage growth across the board, suggesting that it is not just routine (lower paying) jobs being targeted and that the bargaining power of workers in specialist occupations is being affected. A U.S. study (Manning, Massini, & Lewin, 2008) corroborates this interpretation, with nationally representative surveys indicating that employers are much more motivated to offshore in pursuit of specialized labour than they were just a few years ago. Some of this may have to do with labour shortages (Helliwell, 2007); however, even if there are some shortages, which are usually exaggerated or regional in nature, it can’t explain the massive spike in companies offshoring IT work and product development, including R&D, engineering and product design. What is not clear from any of the offshoring data (yet) is how such practices change

76 Communications; finance and insurance; real estate rental; hotel services; repair services; business services, including equipment rental, engineering and technical services, and advertising; vehicle repair; medical and educational services; and purchases from government enterprises.
77 The U.S. research (Manning, et al., 2008) above indicated that, of the 16,000 companies in the study, over half had implemented offshoring of IT services by 2007. Almost 40 percent were offshoring product development and well over a third were offshoring administrative business functions like accounting and financing.
actual divisions of labour in the workplace, and if the jobs being outsourced are generally the more routine specialist roles or more advanced roles demanding high levels of theoretical knowledge and judgment. Certainly, it may be making some specialists and some managers less secure, but is this altering the social relations of production?

*Something Old, Something New: Emerging Strategies for Increasing the Productivity of Specialists.*

One of the key involvement strategies to foster greater productivity among specialists (and among specialists and managers) has been collaboration and empowerment via team-based and self-directed management. The outcome of this devolution of monitoring, evaluation and discipline, however, tends to be a mixed bag of results for managers and specialists. Certainly, greater responsibility and decision-making is desirable among specialists (as among all workers). Ó Riain (2001), working in Scotland in the software development sector, describes how the team he worked with spent long hours finishing a project despite the absence of a manager. While the group cohesion grew quite strong during the project, the post-completion phase was, however, marked by competition and fragmentation among team members seeking inclusion in future projects. Ó Riain believes that this post-completion phase, where internal (and external) labour market pressures were
imposed, is effective in allowing management to reassert its control (see Damarin, 2006; Sewell, 2005, for a similar conclusion)."\(^{78}\)

Lehndorff and Voss-Dahm (2005) describe how outcome-based teams within firms implementing internal and external strategies of flexibility leads to the “delegation of uncertainty”. As they describe, “uncertainties as to the relationship between [sic] performance, pay and working time – hitherto elements of entrepreneurial risk – are in part devolved to dependent employees” (p. 311). This can lead to self-managed work intensification as well as to what the authors call “extensification,” employees increase their working time of their own volition. However, such arrangements are still in many ways empowering and desired by employees, and Lehndorff and Voss-Dahm acknowledge the paradoxical nature of self-management by individuals and teams.

The contradictions faced by professional and technical workers are noted elsewhere. In their study of the Finish information technology sector, Blom, Melin and Pyoria (2002) find workers in that field have more education and enjoy more autonomy but are under near constant stress to perform informal learning on their own time. The authors conclude that "[m]ental strain and time and performance pressures are highest among informational workers" and that the “price of autonomy and rewards is paid in time pressure, stress, and close surveillance of

\(^{78}\) Damarin makes finds that the rise in discretionary activity for Web designers is achieved through their fluid job boundaries but, simultaneously, the continuing control their managers exert through derives from contract-based employment relations and labour-market pressures.
work” (pp. 340-341). This conclusion parallels Frenkel et al. (1995) who describe as “info-normative” control (p. 774) the use of performance indicators (what I call outcomes) and employees’ commitment to these indicators. Frenkel and co-authors consider this a new variant of Friedman’s (1977) “responsible autonomy” (reviewed earlier in this chapter) where the type of work (knowledge-intensive) is more effectively completed on the basis of active consent rather than direct, bureaucratic, or technology-dependent variations.

**Expert Systems**

Information technology isn’t just being used for monitoring performance indicators, or for fragmenting work so it can be globally distributed. Ursula Huws, in her book *the making of a cybertariat – virtual work in a real world* (2003), argues professional judgment is at risk from “intelligent” software systems. Picking up on themes raised by Morris-Suzuki, Huws proposes that a new division of labour and hierarchy within “knowledge work” has emerged because of increasingly sophisticated algorithms; growing number of specialists and managers simply complete pre-defined activities, which may still include some problem solving. Although needing technical skills to understand their job, such workers are best thought of as “process knowledge workers,” supporting elite specialists’ more complex and creative activities. The convergence and standardization of specialized skills has enabled managers in the fields of knowledge work, service, and data processing, under enormous pressure to reduce costs, to further centralize control over the labour process and routinize where possible. In another piece, Huws...
(2006) writes about the effects of organizational centralization and rigidity, in that such trends create:

enormous dilemmas for creative workers themselves. Starting from an urge to express themselves or create something meaningful or beautiful they want to give their all to the task in hand. But every extra contribution they make may involve a further degree of self-exploitation – in terms of putting in extra time, accepting lower pay or poorer conditions, or handing over their knowledge in ways that may contribute, either directly or indirectly, to constructing new bars for their own cages, or those of others. (p. 10)

Huws’ view clearly owes much to Braverman and Marx’s analyses of capitalist imperatives for control and, consequently, the degradation of work.

Less polemical, Alvesson and Thompson (2005) survey the corpus of research on organizational change and find that neither degradation (intensification of bureaucratic rigidity) nor a broad trend to trust and self-management (post-bureaucracy) accurately capture the direction of organizational transformation. Rather, they find hybridity and paradox. Broadly, like many of the others reviewed above, flexibility has become a consuming concern but the results have been difficult to assess for directionality. They acknowledge there has been a trend toward “post-bureaucratic” forms of organization (e.g., delayering, increased autonomy and involvement in operational decision-making) but at a much more “modest” level than mainstream theorists and business leaders believe. Network structures have become more common, but, even where it has enhanced autonomy for some and delayering of managers is identified, IT systems provide remaining and senior management with tools for coordinating. Control is still de facto centralized, and perhaps more so in organizations where production and services
are highly distributed. Alvesson and Thompson propose the concept of "selective bureaucratization" (p. 499), arguing that:

Rather than the classic contingency argument of a fit between an organizational structure and its environment, it is better to see contemporary organizational forms as a series of hybrids, within which bureaucratic mechanisms normally remain dominant. (p. 501)

They advocate escaping binaries like mechanistic-organic and centralization-decentralization and instead approach bureaucracy as dynamic and, drawing on Adler and others who perceive a growth toward trust, with benefits that need to be acknowledged alongside negative consequences.

Such unevenness is given greater predictability by Choi, Leiter, and Tomaskovic-Devey (2008) who present Australian evidence that speak to structured power-inequalities among occupational groups even in environments that appear contingent. In contrast to technological determinist arguments, Choi et al. propose that the power and status of workers largely determines whether technology and bureaucracy will lead to low or high autonomy. Using formal education as a proxy for a high skill/low skill ordinal categorization of workers, the researchers find that bureaucracy (as formalization and hierarchy) in general decreases autonomy; only university graduates experience increased autonomy in bureaucratic settings and, interestingly, actually experience increases in autonomy the larger the number of hierarchical levels (number of managers) there are above them. The authors believe this finding largely supports Braverman’s claim of polarization between conception and execution. While I tend to agree with their interpretation, it seems that Choi et al. have not entertained as fully as they might have that differences in autonomy between the highly educated and others are
functional rather than power based. That is, are the highly educated powerful in a way that allows them to resist technically and bureaucratically driven routinization or are they simply performing jobs that are, as the authors suggest, oriented to planning and design (i.e., conception), and don’t lend themselves to routinization? This caution noted, Choi et al. raise interesting questions about the agency of workers, particularly differential power based on control over skill and high-autonomy jobs. I return to these issues in various points throughout this thesis, particularly in my Discussion and Conclusion. I turn now to review quantitative data that focuses on the labour process and social relations of production.

Quantitative Studies of Managers and Specialists.

In the context of the new class debate in the 1970s and early 1980s over occupations, skill and capitalism, it became clear that the extreme differences in claims between Braverman and Braverman-inspired researchers, on the one hand, and optimistic visions of postindustrial knowledge classes following Bell’s lead, on the other, were as much an issue of differences in measurement as they were theoretical. Much of the new class theorizing, including those claiming a constrained and contradictory “middle” class, depended mainly and sometimes entirely on occupational coding systems. While occupational coding systems were and are diligently prepared in most cases, they remain static and generalize from job descriptions on the assumption that such descriptions are on the whole valid. Such coding systems, like assumptions and measures of skill, can be biased by cultural norms and roles.
Problems measuring skill and occupations.

It is argued that, like Marx, Braverman's disregard for highly gendered domestic and care work, often unpaid, has meant these important areas of study remain outside the boundaries of traditional studies of “work.” This gender-blindness has led to a narrow definition of skill based on male notions of work (Meiksins, 1994), and the process of defining “skilled” and “unskilled” work has been used to subordinate females (see Appendix D). The same sort of bias has affected racialized peoples. Visible minorities have, historically, been relegated to marginal, low-paying work. Race is often a barrier that, even though individuals may possess the necessary credentials, disadvantages groups from gaining access to jobs. The employment experience of minority groups, while heterogeneous, is often characterized by underemployment if not unemployment, poverty-level existence despite employment, and a mismatch between worker attributes and the skill requirements of the job. Often, those minority groups that are seen as “economic successes” are forced to work multiple jobs or extended hours to attain their status (Block & Galabuzi, 2011; Madamba, 1998).

Besides these important and ongoing biases, occupational classification systems and the skill assessments embedded within them are claimed to reflect deeply entrenched biases against manual work, leading to systems in the early part of the 20th century that continually underestimated the difficulty of, for example, farm labour while over-estimating the intellectual requirements of white-collar
service work (see Braverman, 1974). While occupational coding has improved in quality, through greater involvement of experts and more rigorous studies of workplaces (e.g., the National Occupational Classification (NOC) system in Canada) contemporary coding systems may continue to exhibit what Spenner (1990) describes as “ideological and constructionist influence” (p. 402). More recently, Sawchuk (2008) has reviewed the process of skill identification and competencies and found it to be highly politicized. Sawchuk agrees with others that, in the context of government and industry-led frameworks, the problem isn’t just measurement but what skill and competence are. In many instances, these are defined by employers.

Second, occupational coding systems are inherently generalizing. All coding systems are averages, in a sense, taking what could be significantly heterogeneous intellectual demands and opportunities for responsibility and/or discretion and finding a middle-point that is then provided as “the” job description, albeit sometimes with caveats on variance (e.g., NOC codebook) that allude to but don’t provide specific information on how much the distribution of skills for a given occupation deviate from a normal curve. In this way, any analysis using occupational codes must be cautious about variation within occupations (though see description

79 In critiquing the assumptions and biases inherent in occupational classification systems of the time, Braverman used direct measures of the training necessary to become competent at various occupations that he argued proved many semi-skilled occupations could be learned quite quickly. Despite this, subsequent labour process research tends to involve ethnographies and/or industry case studies on the content of work, which are then used to extrapolate to capitalism as a whole.

80 The problem, Spenner points out, is that it is difficult to know how much bias continues to permeate occupational ratings, be it mental-manual, jobs requiring formal education versus apprenticeship, and/or gendered.
of the NOC in Chapter Five). Nor can occupational codes tell us much about the extent to which the education of workers matches the requirements of their job, if they are under-utilized (a.k.a., over-qualified), or if they are under-qualified.81

Third, occupational classification systems are inherently static and cannot feasibly be updated with any regularity. The problem of static codes in Canada has in part been remedied by the replacement of the Canadian Classification and Dictionary of Occupations (CCDO), used from 1971 to 1993, with the current National Occupational Classification (NOC) (Human Resources and Skills Development Canada, 2012). The NOC was promoted by then-named Human Resources Development Canada as an improvement based on a variety of large and small changes. Where the CCDO categorized jobs only by “skill type” (i.e., occupation), the NOC further separates occupations by “skill level.”82 The improvements in the NOC need to be acknowledged, particularly the additional dimension of skill level; however, the changes do not remedy the static nature of classification systems and reproduce the traditional fixation on formal education, of which I will say more shortly.

81 The work of Livingstone (2004) on education-job matching suggests that variance in education required to perform most jobs is quite substantial, and that the tasks performed by employees, including specialists, is frequently less complex than is often assumed by assessments based purely on occupation classification. This issue is discussed in more detail below.
82 Skill Level A - University education; Skill Level B - College level education (including trade apprenticeships); Skill Level C - Secondary school plus a period of job-specific training; and Skill Level D - Short work demonstration (no formal education required). As well, less significant but important changes include: the addition of entry requirement information and possibilities for career advancement; the smallest groupings, “unit groups,” now include only those with the same skill level and skill type; and administrative occupations have been removed from “management” major group and reclassified.
In attempting to move past the widely recognized limitations of occupational classification systems for assessment of job complexity and job control, and social relations of production more broadly, many researchers combine occupational analysis with wage rates and/or formal educational attainment. This strategy, what Spender (1983) calls “indirect measurement” (p. 828), provides the researcher with improved proxies of the complexity of work yet these too are of disputable validity and are still “activity-distant,” telling us very little about what is actually happening within the labour process itself.

**Indirect Measurement of Job Complexity, Job Control and Authority: Formal Education, Technology and Wages.**

Formal educational attainment performs heavy lifting across a range of debates and disciplines, including fields of study related to societal and economic change, knowledge-intensity of industry, occupational change, stratification, and class. A relatively recent example of using educational attainment to ascertain knowledge-requirements of jobs can be found in Brint’s article (2001) in which he attempts to add greater empirical sophistication to the concept of the knowledge-based economy. Brint’s work, centred on what he calls the “scientific-professional knowledge” (SPK) economy, is important in pointing to the variation in working conditions for specialists within various “knowledge-intensive” subsectors of the economy.83 Yet, as nuanced as the rest of his analysis is, Brint fixates on knowledge

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83 For a Canadian study on knowledge-intensive sectors and employment, see Beckstead and Gellatly (2004). One of their key conclusions is that, if level of employment of professionals and other specialists is
generated and transmitted by higher education, arguing that the knowledge-intensity of different industries is best measured by the proportion of workers holding “advanced” professional and graduate degrees (he excludes basic undergraduate degrees as too common to make any knowledge-intensity estimates from). As extreme as Brint’s position is, in focusing exclusively on advanced educational attainment with no attachment to occupational taxonomies, his point that undergraduate degrees are an increasingly weak measure of job content is important. It speaks directly to, and is an example of, a key problem in using formal education as a measure of job complexity: credentialism.

Randall Collins’ well-known work (1979) on credential inflation argued that formal education had increasingly less to do with what the a worker does in their job and more to do with labour market competition in an environment of widespread credential attainment and shrinking need of industry for workers as labour-saving technology proliferated. The formal education system has become both a tool of governments to keep unemployment low and a tool of students to get a “good” job in the “credential market” while simultaneously gaining social and cultural status. In terms of the distinction between white-collar and blue-collar jobs, and between specialized and non-specialized jobs, the credential blocks mobility and has more and more been built into the very definition of the jobs. Spenner (1983), echoing many of these sentiments, points to the difficulty in ruling out the measure used, a greater number of “knowledge-intensive” industries become visible, including extractive sectors like natural gas.
causes of variation in education or wages. Researchers using such measures risk make a series of assumptions about the stability of indirect measures that may not be justified. In particular, issues of supply and demand of labour at various credential levels can influence wages, to say nothing of national institutional arrangements, government legislation around minimum wage and occupational closure, outsourcing, unionization, and other socio-economic and political variables.

More recently, Livingstone (2004) has used a range of evidence on the discrepancy between the educational attainment of workers and the level of education needed by their job. Examining the self-reports on the credential needed for entry to work versus the credential possessed by the worker, the credential possessed by the worker versus the actual skill needed to perform the job, and a host of others, Livingstone finds that underemployment—or underutilization—afflicts a substantial portion of the workforce, especially and not surprisingly those in non-specialist occupations. A focus on human capital alone, despite recent efforts to recognize the multidimensionality of learning sources, clearly misses the issue of underemployment.

**Direct Measures.**

Spenner’s article (1983) was an important effort to move away from occupational coding systems as a proxy for skill and toward clarifying the operationalization of skill. Spenner called for direct measures of skill to increase validity and reliability, and allow replicability and criticism, and was part of an important move towards looking more critically at job titles and descriptions associated with occupations. Spenner finds that both his dimensions of skill
(technical complexity and autonomy-control) can change based on both shifts in the composition of occupations and shifts in work content, described as “the technical nature of work and role relations surrounding its performance” (p. 826). The point here is that occupational composition must be examined interactively with content, “[f]orces that accomplish upgrading or downgrading may act on one front but not the other, or may act in contradictory ways on the two fronts” (p. 826).

Work by Warhurst and Thompson (forthcoming) examples recent efforts to more directly study the content and context of skill/knowledge in the workplace. They propose greater attention to knowledge demands for entry (“input issues”), opportunities to apply and create knowledge (“output issues”), and the content of the knowledge and learning needed to perform the job (“process issues”). They also stress the need to contextualize findings related to these three issues through (as I interpret their proposed list) sustained engagement with factors such as organizational type, employment contracts, training systems, labour markets, occupational differentiation and closure, and regulatory environments.

Survey data.

In Canada, John Myles (1988) sought to use more direct measures of changes in skill, power, autonomy and other issues related to the labour process and the class structure. In the study he uses a definition of skill that accounts for not only educational requirements but training time, complexity of task and degree to which

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job involves routine tasks. He then synthesizes skill estimates with self-reported skills. Myles finds that the emergence of a service-sector dominated economy had led to a broad upskilling trend but that the overall distribution of skills still indicated a substantial mass of workers in low- and semi-skilled occupations. Myles goes on to disaggregate in terms of sector and occupation in order to examine the veracity of both Braverman and Bell’s general theories. He concludes that neither is quite right: neither the deskilling thesis nor upskilling thesis could account for the complex distribution of skills that were appearing in the Canadian workplace. Skill (as-complexity) increases in new professional and manager occupations hadn’t come at the expense of the working class, as Braverman predicted, and a mass of highly skilled service occupations hadn’t emerged, as Bell predicted. Instead, Myles found that, according to workers themselves, there had occurred a polarization of skills within the service sector through the late 1970s and 1980s.

More recent national-level evidence of changing levels of responsible autonomy (alternatively labeled “discretion” or “autonomy-control”) in Canada remains fairly thin.85 The Workplace and Employee Survey (WES) (Statistics Canada, 1998) asked managers a range of questions about new workplace practices, including self-directed work teams, problem solving teams, and employee involvement with management in business decisions. Managers from 110 workplaces were queried if 1) at least some workers were involved in the practice

85 See, however, Livingstone and Scholtz (2006), who use the same surveys and some of the same variables used in this dissertation.
and if 2) at least half the workforce was involved in the practice. The percentage of firms reporting at least some employees involved in new workplace practices was expectedly high, with half reporting at least some self-directed work teams; nearly ninety percent reporting task forces, problem solving teams or quality circles; and over eighty percent reporting employee involvement with management in business decisions. However, when asked whether at least half the workforce was involved, the numbers fell enormously. Just over ten percent reported at least half their workforce participated in self-directed work teams, just over a fifth indicated at least half were involved in task forces, problem solving teams or quality circles, and around fifteen percent involved employees with management in business decisions. The Organisation for Economic Co-operation and Development (OECD) uses the data from the WES study to compare to other member nations (1999), finding Canada generally similar to Japan and the United States but lower than European nations. What this data doesn’t tell us, for any of the countries, is which workers are included and which are excluded from these workplace practices.

Data from a large British survey (n=~28,000) provides additional insight into how discretion is dispersed within workplaces according to class and sector. Using results from the 1998 Workplace Employee Relations Survey (WERS) relating to workers’ influence over range of tasks, how one’s job is performed, and pace of work, Harley (2003) finds that occupation continues to be a strong determinant of discretionary power. That is, the best predictor of discretion was being in a managerial job, then professionals, then associate professionals, and so on down the
occupational hierarchy. Somewhat surprisingly, those in the production sector enjoyed more discretion and pay than those in the service sector.

Another study from the United Kingdom by Felstead, Fallie, and Green (2002) uses a 2001 survey (n=4,470) that, among a wide range of indicators relating to skill, education, industry, and occupation, includes a number of questions about job discretion. Using a single indicator related to choice over the way a job was done and a “task discretion index” that included questions on pace of work, job design, which tasks job involves, and influence over quality standards, Felstead et al. found that:

- the rise in skills among employees has not been accompanied by a corresponding rise in the control they can exercise over their jobs. Rather there has been a marked decline in task discretion. For example, the proportion of employees reporting a great deal of choice over the way they do their job fell from 52 percent in 1986 to 39 percent in 2001. The proportions reporting a great deal of influence over what tasks are done fell from 42 percent in 1992 to 30 percent in 2001. This decline occurred for both men and women. ‘Professional’ workers have witnessed a particularly sharp decline in their control. (p. 13)

Specifically, managers job control declined between 1986 and 1997, but then levelled between 1997 and 2001. Between 1986 to 2001, professionals’ control over their work plummeted from over two-thirds reporting a great deal of control in 1986 to less than 40 percent in 2001, leaving them with discretionary power closer to the workforce average. This pattern showed up in the task discretion index as well, where from 1992 to 2001 professionals’ discretion declined -0.31 (on a 0 to 3 scale). This decline was similar to those in personal services (-0.33), sales (-0.34), plant and machine operations (-0.30), and extraction (“elementary”) positions (-0.32). Managers lost the least discretion (-0.13) while skilled trades held the middle
ground (-0.19). Felstead et al. also report that the decline of task discretion was apparent across all industries, but was strongest in key service areas like education, public administration, finance and real estate and business services.

The primarily qualitative research into organizational restructuring, presented first, and the mainly quantitative research into complexity and discretion, presented immediately above, present a pattern of change that is difficult to capture in any theory that attempts to predict linear trends toward either upgrading or deskilling. The paradoxes and complexity of the empirical research have played out in a variety of ways within labour process research.

Conclusion

What emerges from the theories and evidence presented in this chapter is that there continues to be substantial disagreement over: the nature of changes in the activities of specialists and, less so, managers; how such contradictory evidence should be interpreted vis-à-vis the trajectory of specialist and managerial power within the social relations of production; and the class interests and location of specialists and managers. Unfortunately, as noted a number of times throughout the literature review, many class theorists depend on indirect proxies to make claims about specialists’ and managers’ activity and power in the workplace. These indirect proxies include: formal educational attainment, job descriptions linked to static occupational coding, and/or changes in occupational composition. Related to these methodological problems are conceptual problems in the study of class, particularly how class relationships and class boundaries should be theorized. It is to these
issues that I now turn, laying out over the next two chapters my approach to: class, operationalizing class, organization and skill, and multi-method investigation.
Part 2 – Concepts, Hypothesis, and Methods
Chapter Four – Concepts: Class, Organization and Skill

Introduction

At a time when markets and corporations are expanding both in terms of geography—penetrating and connecting markets around the globe—and in terms of scope—seeking new forms and subjects of commodification—control over how and what we produce and distribute is vitally important. Who receives life-saving drugs here in Canada and abroad, are we going to move to a two-tier medical system, what steps we take to reverse environmental degradation, and what steps are we going to take to reduce growing income disparity? These are just some of the major concerns of our time and, while there are clearly other dimensions like race, gender, nationalism, and religion at play, issues of political and economic power, interests and struggle mean that class must be included.

More everyday class-related issues have important consequences on people's lives as well; daily subordination, monotony, poverty and uncertainty draws our attention to ethical, moral questions about what type of society we want, what are the best ways to organize and recognize our paid and unpaid labour, utilize our talents, and foster democratic values and processes. The “new class” polemic is not simply some academic exercise or a part of macro-level understandings of modes of production. Knowledge of the structure of power has important implications for how Canadians perceive the world around them, plan the future for and with their children, make decisions to support workers’ right to organize or engage in activism, sift through political rhetoric around free-trade, and on and on. It is the impulse for
the privileging and merger of the democratic, the empirically supported, and the moral that provides the context for my approach to class.

**My “Working” Concept of Class.**

I begin this chapter by outlining in general my approach to the concept of class. I then move on to discuss in more detail the core tenets of this approach and conclude the chapter with my hypothesis, outlining what I expected to find in combining quantitative and qualitative data to adjudicate among the various knowledge class theories. Let me begin by stating what my concept of class is not: my approach to class rejects radical structuralist models that see no need for empirical and/or comparative research. I also explicitly reject culturalist efforts to rethink class, particularly those who move class analysis away from occupations and the workplace.\(^{86}\) I further reject essentialist approaches to class that minimize the importance of other forms of inequality in people’s everyday lives or, more broadly, shaping and maintaining social institutions.\(^{87}\) In what can be described as a blend of Marxist and Weberian approaches to class, I argue that class happens in the sphere

\(^{86}\) Issues of non-occupational wealth, social power and cultural practices associated with different classes are of course very important. Bourdieu’s (e.g., 1984) work (see Appendix C) makes important contributions to the study of class reproduction, and his “cultural” capital is useful for the study of power in contemporary societies; yet he, like others, is undercutting any strong critique of the way ownership and control over productive resources—or the lack thereof—structures class and society in countries like Canada.

\(^{87}\) The idea that other forms of inequality such as race and gender are as important as class in understanding stratification in society does not, I believe, pose a serious threat to the idea or study of class—it simply identifies that which needs to be called out: class reductionism. In fact, recognition of these inequalities is useful in drawing attention to mechanisms of subordination that may have eluded class-based analyses in the past. This has the potential to make the study of class more robust and relevant both to those in other fields and non-academics, though is largely beyond the scope of this dissertation.
of productive activity and is inherent to the social relations of production under capitalism.

The primary axis distinguishing classes has been ownership: control over productive resources and legal right to the profit generated via this control. Classes are not, however, simply categories in the way people can be grouped by income; instead they are relational and antagonistic. It is here that the concept of exploitation is necessary for explaining the nature of the relationship between owners and workers. Below, I argue that the concept of exploitation can be detached from the labour theory of value while retaining the ability to describe an asymmetrical relationship where one group’s material benefit depends on the deprivation of another group. That is, there is little doubt that workers produce the commodities that generate profit and they create substantial value in these commodities that exceeds their wages, but whether workers are the source of all value or just “most” of the value is, to me, a red herring. While I continue to think about the LTV and its relevance, I argue below that an antagonism-based definition of exploitation is adequate to serve as a logical and moral tool for critiquing capitalism, generally, and understanding class structure, specifically.

This reconceptualization of exploitation owes much to Erik Olin Wright’s work.88 Like Wright, as soon as there is an attempt to theorize a non-binary class model one must grapple with problem of what to do with the concept of

88 My conceptualization of class has also been deeply influenced by my work with David Livingstone (see his 1982 book for detailed information on the nuances of his approach).
exploitation. Do specialists exploit non-specialists? Do managers exploit specialists? I argue below that Wright’s early, labour-process inspired work on “contradictory class locations” and his later work on exploitation among occupational groups are in fact much closer than he or others acknowledge. That is, and as I describe in more detail shortly, if exploitation is conceived broadly as an asymmetrical, antagonistic codependence, where one group’s material wealth depends on the deprivation of another, then domination in the labour process is the mechanism for maintaining the asymmetry. To understand how domination leads to exploitation, I argue further that one must study in detail the division of labour, as well as the way organizations, occupational closure, technology and labour markets play a role in shaping and perpetuating antagonistic relations. Control over productive assets (or, the forces of production), over the labour process, and over strategic and operational decision-making are the mechanisms that allow one group to potentially gain and hold material advantage at the expense of another. Domination doesn’t always mean exploitation, but exploitation is always founded on domination of some sort and degree.

I advocate turning to fields of study like labour process theory that offer deep, contemporary insights into relationships not only between capital and labour but among groups of workers. In this way the theory of class is connected to

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89 The call to connect class analysis with specific changes in work relations is hardly new. In many ways, it is the path set out by Marx (at least as I interpret Capital and other works). In my introduction to the new/knowledge class debate, early in my doctoral studies, my initial and theoretically ahistorical reaction was primarily methodological: if you're going to make claims about class power based on what people do
historical developments, and class becomes a tool for explaining contemporary events and trends. It may be that the class structure is tending toward a polarized, even dichotomous structure, but to presuppose this, to rule out a more complex class structure *a priori*, is dogmatic and makes class analysis as irrelevant as its detractors claim it to be.\(^90\)

**Levels of Analysis**

The study of class is polarized by structuralist, theoreticist approaches, on the one hand, and historicist, realist approaches, on the other. I argue that these poles cannot provide a rich enough understanding of class relations and class structure to properly evaluate intra-systemic claims of a new knowledge class. Theory must be informed by history (or, more specifically, change and variation). Historical studies of class must, likewise, be informed by relevant theory. Of course, different research questions will demand different approaches to class. If a project is examining the transformation from feudalism to capitalism then a broad study of class with ownership as the main unit of analysis is appropriate. If a project is concerned with specific moments in the history of class formation then a study of union busting, workers’ beliefs and shop-floor politics in, say, early-20th century (i.e., knowledge workers) you should probably study what people do and not depend on proxies. The notion of reconnecting class analysis with the specific discipline of labour process theory was proposed by my advisor, David Livingstone, as the central argument of a paper that remains under development. I was alerted in this way to the split between class analysis and labour process, and to the work of Carter, Tinker, Neilsen and others presented below. The argument I develop here is somewhat different than Livingstone’s position, however, particularly in emphasizing exploitation via closure.

\(^90\) Overt class-based action may have waned and other forms of struggle become more common, but the assertion of class irrelevancy seems, at best, premature and, at worst, a wilful refusal to engage contemporary political economy.
Chicago is appropriate. Direct concern with mapping class structure wouldn't be as central. If one is interested in class mobility and reproduction, examining the interplay among values, taste, and power-granting knowledge bases is entirely legitimate, as exampled in the work of Bourdieu (1984). One must simply be clear about the level and unit of analysis. My study is not focused on class-consciousness or class mobilization, though these concepts do come up; nor is it primarily concerned with the radical transformation of classes as a society passes from one mode of production to another.

My proposal that class can legitimately be studied at various “levels of analysis” draws directly from Ira Katznelson’s attempt (1986) to reconcile theory and history in response to the overt, late ’70s hostilities between historicists like E.P. Thompson (1995) and rigid structuralists like Althusser (1969). Katznelson proposes that class be conceptualized as “four connected layers of theory and history”, including: 1) structure, 2) ways of life, 3) dispositions, and 4) collective action (p. 14). In analyzing the structure of class it is appropriate to talk of owners and exploited non-owners, of great shifts between modes of production and societies, and the “logic” of capital. Katznelson describes this level of analysis as “experience-distant.” Ways of life on the other hand are “experience-near” (p. 16) and examine social relations in the workplace, labour markets, and the general social organization of society. Katznelson warns that the temptation to read “ways of life” off from “structure” is an error: “Such a conflation...eliminates in one stroke a series of important questions about the connections between key aspects of capitalist accumulation and national economic histories on one side and the
organization of labor markets and workplaces on the other” (p. 16). Katznelson is also averse to assuming disposition (including class consciousness, but also incorporating to some extent Bourdieu’s habitus) or collective action from the general “structure” that characterizes the capitalist mode of production.

Such an approach to class also suggests a route out of such (false) dichotomies as structure-agency and objective-subjective analysis. This approach is compatible with Giddens’ concept of structuration, whereby thinking, critical agents reproduce and alter the structures that have shaped their lives and will shape the lives of others. In looking seriously and non-dogmatically at the interplay between structure, ways of life, dispositions and collective action, the study of class that privileges structure and objectively determined class locations can be reconciled with subjectivist concerns. People and history matter, class isn’t just a location or position to be filled within theoretical social-relations of production. Individual’s experience of their objective, occupationally derived class location is mediated by a variety of relationships, experiences, and material arrangements that exist outside the workplace. Class identification, and action based on class identification, is contingent, often rife with contradiction, and does not develop in a linear fashion as a direct derivative of class location. Class identification is impacted deeply by local and national factors and mediated by other differences like gender, race, religion, and so on. Clearly, I do not subscribe to strong “realist” claims that classes only exist

91 For example, a factory worker may inherit a substantial stock portfolio, or a small business owner may work for pay in the evenings to make ends meet, or an engineer who works on factory automation may be married to a unionized auto-factory worker and thus face both ideological and material choice-conflict.
when recognized by those within them, but I do recognize that realist concerns are worth attending to, and class consciousness and class mobilization are vitally important for understanding class struggle.

At what level of analysis should this study be conducted? My core goal is to assess if a powerful, cohesive new knowledge or creative class has emerged within a Western, advanced capitalist economy like Canada. The primary argument of knowledge class proponents like Bell and Florida is that economic change in the form of globalization-driven competition and skill-biased technology is demanding more so-called knowledge workers while making their jobs more creative and difficult to manage, hence giving them more power over both their jobs and the organizations they work for. Specialists are thus different from, and have different and often opposing interests to, less specialized employees, on the one hand, and owners and senior executives, on the other. Explicit in some new class claims, implicit in others, is the notion that the esoteric knowledge and/or creative capacity of many specialists have now taken on the quality of a property (i.e., knowledge is now the fundamental resource in postindustrial forces of production). My project then is not studying a dramatic shift between modes of production, even if the hyperbole surrounding the postindustrial thesis sometimes suggests otherwise. Neither is my project focused on the class-consciousness of those in occupations that might be assigned to a new knowledge class.

I am primarily investigating the role(s) played by those with specialized knowledge within contemporary organizations, if they are in fact gaining substantial power over their day-to-day jobs and within strategic organizational decisions
based on their possession of scarce knowledge, and to what extent they are different from other workers and similar to other specialists. Of particular interest, and central to evaluating the claim of a “new” class, is where the interests of specialists lie: are they hand in glove with management, are they aligned in a fundamental way with other workers despite their privilege, are their interests antagonistic to both capitalism’s elite and the general labour force, or are their interests contradictory and unclear? Inherent in such a question is the extent to which specialists depend on the subordination of other workers to maintain their own privileged position. Such a study demands a particular approach to class, conceptually, operationally and methodologically. Most immediately, such questions (and the entire debate over the existence of a knowledge class) raise the thorny issue of exploitation, for Marxists at least. Can the core Marxist concept of exploitation survive where the working class is conceptually divided? Can one group of workers exploit another group of workers?

Many class analysts have rejected exploitation as a relevant concept for understanding class in contemporary societies. Concepts like credentials and mobility (e.g. Giddens, 1973), authority (Dahrendorf, 1959), closure (Parkin, 1979) or type of employment contract and market capacity (Erikson & Goldthorpe, 1992) supplant exploitation (and ownership) as the base for dividing workers into classes. Here, the idea of a knowledge class is less theoretically problematic but, as I argue shortly, class loses its causal feature and key mechanism for explaining the antagonistic relationships. In what follows, I examine the reconceptualization of exploitation by neo-Marxists and propose that authority, skill, and other labour
process issues should not be approached as exclusive and incompatible with exploitation, but rather as complementary and in fact necessary for a fuller understanding of exploitation and class.

**Exploitation and the Problem of the Middle Classes**

As described earlier, orthodox Marxist approaches to exploitation tie it in a direct way to the labour theory of value (LTV). The LTV provides orthodox Marxism with a tidy proof that all surplus value is created by and belongs to workers, but is appropriated by owners.\(^92\) I have no quarrel with the proposal that workers create value beyond that which they are paid for (G. A. Cohen, 1979).\(^93\) Contrary to some critiques—like the “corn” theory of value (Roemer, 1982)—not anything can create value in other commodities. But it is much harder to say with certainty that supposedly “unproductive” coordinating activities don’t add value, or that the more and less efficient planning of how, say, computers or robotic manufacturing are integrated into the labour process doesn’t contribute value. As well, those advocating a LTV largely neutralize the variable impact of technology by skipping over the innovative, introductory period and jumping straight to the point where a given technology has fully diffused, thereby removing the advantage for early

\(^{92}\) Marx’s labour theory of value looked at value creation as something socialized and averaged, which could be illustrated in specific instances but not calculated per se.

\(^{93}\) Cohen has constructed a complex argument that comes to an important and rather simple point: the labour theory of value is not necessary to a Marxist concept of exploitation. Cohen is disinclined to attach herself to a series of propositions where labour creates all value. Rather, he argues that labour creates the commodity, but does not receive all the value inhered in the commodity that it creates. The argument that labour creates all value, and value varies directly with labour, Cohen finds indefensible and a distraction from a notion of exploitation that only needs owners to appropriate some value (they did not create) to be a worthwhile and applicable concept.
adopters. But such efforts to maintain the logic of the LTV make it more esoteric, more complex, and even less useful as a tool for critiquing contemporary capitalism or explaining class structures (King & Ripstein, 1986; Knafo, 2007).

Setting aside the orthodox labour theory of value is important, I believe. It allows the study of class to retain the point of Marx’s “critique of political economy”—that owners appropriate wealth they did not create—while not getting bogged down in a debate over whether labour creates all or just most value. Missing, though, is a clearly articulated, systematized, alternative concept of exploitation, positively defined.

One effort to rethink exploitation without dependence on the LTV is Aage Sørensen’s “rent” based concept (2000b), which shares much with Roemer but emphasizes more strongly that only assets protected by “closed” employment relationships can generate true “rents” and, thus, exploitation. Sørensen (2005) argues that Marx’s insistence on property rights should be maintained but disconnected from wealth in general. Rather, he proposes to:

restrict exploitation to inequality generated by ownership or possession of rent-producing assets. Rent-producing assets or resources create inequalities where the advantage to the owner is obtained at the expense of nonowners. These nonowners would be better off if the rent-producing asset was redistributed or eliminated. A concept of class as exploitation based on the concept of rent is consistent with modern economic theory... (pp. 127-128; italics in original)

Sørensen uses an expansive definition of assets, which allows him to apply his rent theory of exploitation to postindustrial societies where distinct managerial roles, professional associations, unions, and generalized knowledge assets have created conflict among workers. He proposes that rent “will emerge on all productive assets
that are in fixed supply and that actors need to maximize their wealth; or rent may be present as a result of transaction costs involved in getting access to needed assets” (p. 133). Measuring rent is based on fairly neoclassical economic theories of perfect competition and perfect knowledge: any gain above what could be gained in a fully competitive market (i.e., no unions, no closure, equal access to education) is considered a rent.

Sørensen has been criticized for a definition of rent that does not adequately capture the relational aspects of exploitation that creates class and, similar in some ways to the criticisms of Weber’s market capacity (see Giddens, 1973), offers a measure of exploitation that provides little ability to map distinct cleavages among workers, or even between owners and workers. Sørensen presents a model of exploitation that, to me, marginalizes too much the struggle over surplus labour (and therefore loses more connection with Marx than Sørensen will admit) and fails to prioritize what forms of ownership (control over profit and organization v.

94 Wright (2000) critiques Sørensen’s theory connecting rent and exploitation, arguing that rent alone misses the dependence that exploiters have on the exploited, and that dependence is one of if not the core feature of class relations. Wright also notes that Sørensen’s claims that exploitation would disappear in a perfectly competitive capitalist economy misses that there would still be (class) struggle over labour effort, and that Sørensen’s overall logic leads to the counterintuitive conclusion that where “solidarity rents” exist (as in unions, which raise the wage of low-skilled workers) the less skilled are actually exploiting more skilled workers who would otherwise have higher wages in a competitive labour market. Wright concludes that “once the appropriation of labor effort is added as a criterion for ‘the concept of exploitation, the relationship between class, exploitation, and rents becomes much more complex. In some cases rents might still be directly a form of exploitation [while in] other cases, rent-acquisition is better thought of as a way of mitigating exploitation” (p. 1570).

95 Goldthorpe, critiquing Sørensen, writes that “the heterogeneity of rents and of the conflicts to which they give rise would serve to inhibit the degree of formation of Sørensen’s "exploitation classes," as in turn would the degree of shifting and cross-cutting of the lines of conflict that would surely be found. Many individuals would be exploited in one context, but act as exploiters in another” (p. 1576). While Goldthorpe’s point on heterogeneity is useful, I disagree with his criticism around contradictions relating to multiple exploiting positions. This is the very quality of the middle class(es) that Wright and others have highlighted.
control over knowledge assets or decision-making) are more or less important for understanding the capitalist system as a mode of production, a critique I would also level at Parkins' (1979) who attempts to prioritize closure over ownership. That said, Sørensen's focus on rents does provide further, very useful substantiation for looking at occupational closure and credentials as potential sources of exploitation. Of credentials and credentialism he writes (2000):

The monopoly on employment ensured by the credential protects the less able from high-status background from being outcompeted by the more able from lower status backgrounds. Credentials thus increase the ability of high-status groups to confer their advantage to their less able offsprings and increase the advantage to their more able offspring. There are strong incentives for high-status groups to create credentials and closure. (p. 1548)

His work thus ties in an explicit way to concerns articulated by Giddens (1973) in his attempt to integrate structure and mobility concerns. A rent-based approach can also been seen as different but complementary to some aspects of Wright's later, neo-Marxist work on contradictory class locations.

Erik Olin Wright presents a probably better known attempt to pull back from the "labour theory of value" yet retain (or rethink) the concept of exploitation. Developed in the context of his engagement with the new class debate, and seeking to retain Marx's radical egalitarianism, Wright builds off John Roemer's attempt (1982) to update exploitation via game-theoretical principles, where the "essential strategy adopted for the analysis of exploitation is to ask if particular coalitions of players would be better off if they withdrew from this game under certain specified procedures in order to play a different one" (Wright, 1985, p. 68). Thus, exploitation continues to designate an interdependent relationship around material interests; the welfare of the exploiters depends on the material deprivation of the exploited,
resulting in a “zero-sum” situation: one group must be deprived for the other to benefit. Further, the exploited must be excluded from access to certain productive resources. This "exclusion" enables exploiters to appropriate the labour effort of the exploited (i.e., ownership gives certain rights):

Exploitation is thus a diagnosis of the process through which the inequalities in incomes are generated by inequalities in rights and powers over productive resources: the inequalities occur, in part at least, through the ways in which exploiters, by virtue of their exclusionary rights and powers over resources, are able to appropriate surplus generated by the effort of the exploited. (Wright, 1999, p. 11)

In the context of capitalism, this exclusion is built around the privatized nature of control over property and wealth in a seemingly “free” market, rights to profit from property and wealth guaranteed by the legal system. Just as the employee is dependent on the employer for their wage, the capitalist is dependent upon employees to create surplus value that then can be turned into profit. The “pay-off” (Wright’s words; 1999, p. 18) of focusing on exploitation for Marxists is that class analysis is then imbued with a moral element downplayed or absent in other, non-Marxist inspired approaches.

As reviewed in Chapter Two, Wright’s initial work on “contradictory class locations” proposed that workers be differentiated by control within the social relations of production. Wright identified the following domains of control: control over investments and resources; control over the physical means of production; control over the labour power of others; and varying legal control over assets, profit and labour based around the “private” system of property ownership (1976, p. 33). Wright finds that control varies in significant and contradictory ways among senior managers, middle managers, forepersons, professionals, and so on. Wright was
heavily criticized for his attention to issues of domination and authority (i.e., the labour process) at the expense of exploitation.

In the context of his attempt to bring exploitation back into his analysis of the middle (contradictory) classes, the impetus for his rethinking of exploitation, Wright’s first reformulation (1985) posited that exploitation can occur through ownership but also through the “assets” authority and skill. In this model, aligned in many ways with Sørensen’s work on asset specificity and class, the “loyalty rent” paid to those in managerial positions is based on their administration of delegated authority over employees, including disciplining workers’ to ensure maximal effort. This rent is an “appropriation of surplus” by managers and thus makes them exploiters. Likewise, among non-managers those with scare skills are paid a “skill rent.” Such a rent is usually dependent on the exclusion of others, and their actions to appropriate surplus also make them exploiters of other, less skilled employees. Wright has changed his mind on this matter, again, based on the notion that managers and skilled labour contribute to the surplus and may in fact only be appropriating the surplus (as income) they themselves contributed. In his book, Class Counts (1997), Wright proposes a model where managers and skilled labour “occupy a privileged appropriation location within exploitation relations that differentiates them from ordinary workers” (p. 19; italics in original), but they are not exploiters per se.

Wright’s initial turn away from authority and control and towards exploitation and ownership in theorizing class relations finds support, somewhat surprisingly, within labour process research itself. Thompson (with Smith, 1999)
proposes that changes in the capitalist labour process have been over-emphasized in class analysis and that ownership should be reasserted as the central focus. Thompson calls attempts to reconnect labour process theory and class analysis a “flawed project” (p. 205), and the late 1970s efforts of Poulantzas (1975) and Carchedi (1977) to do so a “sterile functionalist project” (p. 219). Thompson’s point that the centrality of ownership of the means of production has been obscured within LPT is partially true, but I disagree with his overall conclusion that, I believe, perpetuates a false dichotomy.

Exploitation AND Control.

Capitalism is inherently dynamic and class, as a key organizing force in society, varies across both time and space. Put another way, if class is historical and relational, identifying class boundaries should never be assumed and, equally, can’t ever be as easy as slotting in individuals based on their occupational title alone. Anthony Giddens, in his book *The Class Structure of the Advanced Societies* (1973), makes a similar point in the following passage:

The problem of the existence of distinct class ‘boundaries’ [...] is not one which can be settled *in abstracto*: one of the specific aims of class analysis in relation to empirical societies must necessarily be that of determining how strongly, in any given case, the ‘class principle’ has become established as a mode of structuration.” (p. 110)

While Giddens has other priorities and broader concerns in his discussion of structuration, his argument that classes can’t be constructed abstractly is suggestive of the synthetic approach I am supporting. Carter (1995) laments, however, that, since the 1980s, class analysis and labour process research have become increasingly disconnected:
[T]here is now remarkably little overlap in what are two discrete areas of analysis—class and labour process: class analysis... makes the vaguest of gestures toward the actual day to day relations inside the workplace and... labour process perspectives examine what happens inside workplaces without any informed or extended dialogue with class theory. (p. 35)

The call to reconnect class analysis and labour process has been picked up more recently by Neilsen (2007).

Neilsen proposes that within a Marxian analysis a “two-stage subordination of labour to capital” (p. 94) can be identified: “Formal subordination” involves people being forced into wage labour; “real subordination” occurs within the labour process as owners and managers implement strategies to control labour in order to maximize effort (see also Stark, 1980). “The transfer of power and control to capital renders labour, first through formal subordination, as dependent and exploitable; and second, through real subordination, as dehumanized, deskilled and continuous” (p. 94). In this view there is mutual dependence between formal and real subordination. Neilsen uses this framework to argue that Erik Olin Wright’s concerns with domination in the labour process, which deeply influenced his original model of “contradictory class locations” (1976), is preferable to his revised, mid-1980s model that sought to replace a supposed Weberian focus on subordination and oppression with a more explicitly Marxian focus on exploitation. For Neilsen, this “analytical Marxist” modification “removes history, power and the labour process” (p. 115) and ends up less true to Marx, conflating exploitation (what he considers a general, abstract mechanism) with class (a historically variable consequence of this mechanism). Neilsen calls for a return to an analysis that can accommodate contradictory, entrenched middle classes, and for an approach to
class analysis that recognizes both the logic of capital and resistance to this logic, and the historical and geographical variation that emerges from struggle.

Yet by making exploitation an abstract, general mechanism to be referenced but not studied as an important causal mechanism central to historical variation, Neilsen slides toward his own false dichotomy and loses the thread of “mutual dependence” with which he began his critique. *If we approach exploitation as an interdependent, asymmetrical relationship—where the advantage of one group is based on the deprivation of another group—then exploitation remains central to class analysis, but can only be understood through the study of “real” subordination.* The purpose of vertical authority relations, of the simplification and homogenization of skill, and of occupational closure is to maintain the advantage of various classes. In my reading of Wright, I believe that issues of authority and labour process control remain even in his more recent exploitation-centric models. The implication from Katznelson, Wright, Sørensen and Neilsen’s work is that *class researchers need to include conceptually and study empirically what is “actually happening” in the labour process to fully and accurately understand: the social relations of production, if exploitative relationships exist among differentially credentialed and capable workers, and the class structure that emerges from direct empirical evidence.*

To summarize, I agree with the general thrust of Wright’s reformulation of exploitation that retains an association with the concept of surplus value (unlike Sørensen) but shifts emphasis to struggle over appropriation and to the interdependent, antagonistic nature of the capital-labour relation. I further propose that such a conception allows the use of exploitation as a boundary marker between
classes: for a “new class” to exist it must depend on the subordination and deprivation of non-specialists and, therefore, have group-level interests antagonistic to these other workers. This means that managers and specialists might have interests that correspond, as proposed by the Ehrenreichs in the “professional-managerial class” thesis. Or it might mean managers and specialists each form their own class distinct both from owners and non-managerial employees, where managers’ advantage and privilege position them in conflict with specialists who challenge their authority in the realm of planning and organization, and where specialists depend via occupational closure on the subordination of non-specialists to protect their privileged location planning and problem-solving in the labour process. Or it might be that managers form a new class but specialists are still affiliated with the working class (e.g., Clement & Myles, 1994). Or it might be that managers and specialists have interests that diverge and converge in complex ways with owners and non-specialist, non-managerial employees, leaving them in what Wright (still) calls “contradictory locations within class relation” (1997, p. 17).

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96 In its reconceptualized form used here, exploitation is as applicable to analyses of class in socialist and communist countries as it is in capitalist nations. Within the capitalist mode of production it is worth emphasizing, however, that legal ownership of organizations and rights to surplus labour has so far been the pivotal form of exploitation, with exploitation among workers secondary and reflecting the subordinate and contradictory class location of these managers and specialists.

97 Listing these questions reflects that I leave the issue of exploitation between occupational groups an open one to be investigated and evaluated empirically (see Conclusion to this chapter for more on my approach to theoretical reconstruction). More so, I feel that it is a theoretical construct that needs to be further specified and articulated. My approach to exploitation and class articulated in this section is a “slice” of where I am in my own thinking and I fully expect that my approach will grow more nuanced and possibly change significantly as I continue to read and think about them.
Connecting Class Relations and the Labour Process: Core Concepts for Studying the Social Relations of Production

In studying the social relations of production, exploitative relationships, and the actions and regimes that support such relationships, relevant concepts and themes emerge not just from class analysis and labour process theory but also from critical management studies, organizational theory, and industrial relations. To evaluate the existence and power of a knowledge class is to study what specialists and managers are doing, how much control they have over their specific jobs, and how much control they have over operational and strategic decision-making. Below I articulate my conceptualization of organization and skill, including a proposal that the latter include not just complexity of activity but also task-level discretion and, most importantly, voice (or authority) in strategic decisions.

Organization.

Much labour process and industrial relations research has focused on organizational types in extraction and manufacturing, where issues of flexible specialization, lean production and total quality management have, in some ways, paralleled Frenkel et al.’s typology of bureaucratic, entrepreneurial, and knowledge-intensive organizations (see Chapter Three). The great majority of the occupations associated with the knowledge class exist in service industries but some, like engineers and technicians working on manufacturing equipment, bridge the service-manufacturing divide. Regarding manufacturing organizations, where conception and planning are generally separated departmentally from the shopfloor, we can anticipate that a single organization will use a variety of organizational strategies. For that matter, we can also anticipate that service-sectors organizations will use a
variety of managerial approaches, with one department more bureaucratic and another more knowledge-intensive. Such is the conclusion of Alvesson and Thompson (2005) who, in evaluating the literature on trends toward “post-bureaucractic” organizations, caution that researchers need to be sensitive to intra-organizational variation and what they believe is frequent hybridization of organizing principles. Added to such cautions should be Adler’s proposal that bureaucratic forms can be simultaneously coercive or enabling, with the latter a formalized set of procedures and authority relationships that provide structure spurring learning and innovation (Adler, 2001). For me, organizational typologies are useful but a sophisticated understanding of such labels can only emerge from direct study of what (knowledge) workers are doing, and their relationships with those above, beside and below them in the organizational hierarchy. Central to understanding such relationships is the concept of skill.

**Knowledge, Skilled Work and Deskilling.**

The concept of skill does heavy lifting in a variety of fields and policy arenas. What skill means changes quite dramatically and often the concept is used but not fully defined. At times, skill is used as a synonym for practical technique, at other times it is used to signify the complexity of a job, sometimes it includes theoretical knowledge and sometimes it doesn’t, and sometimes it is used as a measure of employee or specific occupational group power. In the following section I will expand on the various problems facing the concept of skill, but argue that the concept continues to be an important tool for the study of power despite its limitations. I close by proposing a definition where skill encompasses not only
technical complexity and task-specific discretionary activity, but also participation in decision-making in the entire process and environment that a job is embedded in. Such a holistic conceptualization of skill is, I argue, a better measure for evaluating changing relations of production in the workplace, and more accurately captures Braverman’s (and Marx’s) concern with changing skill levels as a measure for exploitative relationships in the social relations of production.

**Skill as contested terrain.**

The concept of skill remains mired in competing and sometimes confusing application and definition, and it is worth briefly working through some of the key issues. First, skill does double-duty in describing both individuals (and/or occupations as a whole) and jobs. Human capital theory focuses on the capabilities possessed by individuals. The Organisation for Economic Co-operation and Development (OECD), in adding dimensionality to simplistic conceptualizations of human capital, starts with the notion that knowledge is not the same as information (pace Machlup, 1962, and Porat, 1977); rather, knowledge incorporates information. Of interest to organizations are those employees who possess human capital in the form of what the OECD calls: know-what; know-why; know-how; and know-who (p. 12). These are useful distinctions, and draw attention to the importance and complexity of “soft,” social skills and networks. Too often, however, those who study

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98 For the OECD, the “what” and “why” forms of knowledge are “informational” in nature, can be codified, are transferable and general (if scarce), and therefore are most easily transformed into market commodities. The “how” and the “who” represent components of “tacit knowledge” which is specific and formed through practical experience (see Polanyi, 1983, for a more critical exploration of tacit knowledge).
human capital makes inferences about job requirements based on skills the worker has. Among those who study the requirements of jobs themselves, more challenging jobs are frequently referred to as “skilled,” though as “knowledge” has gained in popularity as an adjective to describe complex work, the term “knowledge worker” or “knowledge-intensive” labour has gained in popularity.

Another aspects of this more general conflation of capacity and performance are, related, the individualization and decontextualization of skill. That is, skill is approached as a discrete “thing” divorced from (often for measurement sake) the social and collective processes in which knowledge application and generation occurs. For example, Carlsen et al. (2004) approach knowledge as something workers do, as “knowledge in action,” rather than knowledge as an object possessed. Knowledge is "typically tacit, collective, complex, contextual and deeply rooted in culture" (p. vii). It then must be situated in activities; knowledge cannot be abstracted or isolated from work being performed. Skilled work, so defined, involves problem-solving and exists opposite routinized labour.99 Sawchuk (2008), in a review of skill and competency frameworks, makes a similar point, arguing that individualized approaches “are in practice, if not by definition, unable to appreciate the situated or contextualized nature of performance” (p. 52). Sawchuk (2012) makes the point that that the labour process is a learning process filled with

99 Collins (1998) suggests we study the “working knowledge” possessed by all employees instead of prejudging occupations with ambiguous, confusing, and elitist labels like “knowledge workers.” Rather than getting caught up in rhetoric and fads, Collins argues that we must study the application of knowledge in workplaces that continue to be sites of struggle between management and workers.
contradictions. Such contractions are related both to the struggle within everyday operations and within broader struggles for systemic transformation of capitalist relations. Skill use must also be located in the processes of workers finding meaning (use-value) in labour processes dominated by concerns with wage and profit (exchange-value). Here, like Carlsen et al. (2004) and Collins (1998), Sawchuk emphasizes the dynamism of skill application and creation and, by implication, the failure of dominant human-capital theories of skill to capture what is happening in the practice of skills as both learning and labour.

In my study I attend to both the capacity of the worker (human capital) and the requirements of their job, allowing for investigation of the degree of and changes in underemployment or underqualification in the workplace. Underemployment is here defined as a worker possessing greater skill than is required in their job. Conversely, a worker may not hold skills required for their job, and can be described as underqualified (see Livingstone, 2004). In the quantitative part of my research I am bound by the nature of the data to treat skill/competency at an individual level, which is then aggregated. In the qualitative part of my research and in the discussion that follows, however, I explore directly the impact of situated, collective practice of skill utilization and link these to theories of the socialization of the labour process and to the inherent contradictions faced by specialists and managers as they negotiate competing demands and personal desires for meaningful work.

Second, the difference (or similarity) between knowledge and skill is problematic. Historically, the two concepts have been linked to different “collars”: skill has often used to describe “skilled” blue-collar workers like electricians and
carpenters; knowledge has more often been linked to white-collar labour, with "knowledge workers" possessing specialized understanding of processes that are more theoretical and abstract (see Bell, 1974, who emphasized the rising importance of theoretical knowledge). If we do away with the blue collar-white collar distinction, there is some merit in distinguishing between the mastery of specific technique and mastery of abstract, codified knowledge (see Warhurst & Thompson, 2010 for advocacy of such a separation). If theoretical, codified knowledge is increasingly required for jobs, specialist or otherwise, it is important and obviously helps us understand the trajectory of work, education, and training. Hypothetically, one can envision a person who has studied the physics of electricity and circuits but has never worked on a breaker box or stripped wire. Likewise, one can envision a person who possesses advanced understanding of genetic sequencing but has never worked in a lab and doesn’t know how to use a DNA sequencing machine or manipulate sequencing software. But there is something absurd about the implication, which is that these two hypothetical people should be considered "low skill." It also denigrates the vast amount of theoretical knowledge possessed by those in technical jobs, like electricians and lab technicians, who must have a substantial amount of abstract knowledge to undertake their work and who often gain great amounts of experiential knowledge in the course of their work, even if they can’t always articulate it or don’t use proper scientific (esoteric) jargon (see Livingstone & Sawchuk, 2004). The knowledge-skill distinction is further problematized when one considers accountants or computer programmers. When is
an accounting formula “knowledge” and when is it a “skill”? When is an algorithm for software theoretical and when is its application a practical technique?

To me, in the context of this project, the distinction between knowledge and skill is a red herring. My concern is less the type of knowledge and more the general complexity of knowledge demanded by the job and degree to which such complexity is or isn’t changing. Whether the balance of their work is more theoretical or applied is less important than how much control they have over the design of their work (including changes in the requirements and performance of their job), and change in their participation in decisions about the entire labour process in which their job is embedded. While some seek to keep skill linked only to education and technique, when a job is described as “skilled” there is an implicit recognition of mastery, decision-making about how the job is performed, and opportunity for planning and problem-solving. Spenner, in an important article on the subject (1983), makes this point. As reviewed in Chapter Three, he argues we must distinguish between “skill-as-complexity” and “skill-as-autonomy control.” Often the latter is read off from levels and/or changes in the former, when in fact the two can vary independently across and within occupations, based on organizational differences and spatio-temporal variation in legislative controls on work, unionization, level and control of competition in markets, and so on.100

100 Kelloway and Barling (2000) echo this notion, defining skilled (or “knowledge”) work as the ability and opportunity for “discretionary behavior” (p. 292). Rather than a distinct group of occupations (elitist), a characteristic of an individual (human capital), or an individual activity (manipulation of symbols and/or information), we are urged to conceptualize skilled knowledge work as a dimension of labour within varied
These two sides of skill, while intimately linked, must be conceptually unpacked and investigated separately if we are to gain a more sophisticated understanding of changes in the labour process. The capacity to perform complex technical tasks—whether one has the ability to rebuild an engine, audit a company's financial records, or manage and teach a group of small children—does not necessarily mean one will have the opportunity to make decisions about one's job. More specifically, we might consider computer programmers who may need complex, theoretical knowledge to perform their job. While at the centre of knowledge and creative class theories, some programmers may be given little choice in how their job is performed because of standardized procedures, rigid work-flow software, and/or surveillance. For example, Aneesh (2001), focusing on IT-intensive labour processes, highlights how Taylorist, rationalizing principles can find their way back even into jobs demand increased and integrated skills. Proposing a theory of “skill saturation”, he provides an interesting twist to labour process theory where the re-skilling/de-skilling debate is transcended and instead researchers turn their attention to issues of autonomy and rationalization. Skill saturation, as defined by Aneesh, is “a phenomenon characterized by an absolute predictability of procedure and outcome, resulting from an exhaustive ordering of various components of skills, and the elimination of all irregular spaces of work” (p. 363). While the adoption of IT may have led to a “growing conversion of different skills into computer skills as labour environments. Kelloway and Barling define the activities of knowledge work as the creation, application, transmission, and acquisition of knowledge, each a form of discretionary behaviour for which an individual must have the ability, the motivation, and the opportunity.
well as the relative lack of differentiation among new skills” (p. 384), a focus on task splitting or task integration misses the more important rationalization that is occurring. In many labour processes, work is simultaneously being made easy and more intense as management looks for ways to increase efficiency. Aneesh warns that even the most “integrated” IT tasks can be saturated, where options and decisions exist only as part of a predetermined series of steps. New skills have to be learned but the potential to apply them in novel or creative ways is closed off. Aneesh, however, is wary of claiming any trend towards skill saturation; rather, he concludes only that technology is a human activity and that “[d]esign decision about work and technology are socially shaped by a number of different and differing interests, including institutional inertia and resistance to change and at time by mere chance” (p. 366). Yet, as valuable as it is to recognize the paradoxical situation where complexity increases but autonomy decreases, is autonomy-control an adequate concept to address questions of control, and are issues of authority in operational and strategic decision-making theoretically separate to issues of job control as Spenner appears to claim?

In following the lead of Spenner and others, I agree that skill is multidimensional. I agree that issues of complexity and control need to be included but distinguished. I believe, however, that “skill as autonomy-control” needs to be problematized and nuanced. Autonomy has been defined as “freedom from constraint and control over one’s own actions at work” (Choi 2008, p. 427). Yet it has been argued that the concept of autonomy (or autonomy-control, as Spenner prefers) isn’t always a relevant measure for those working in complex, sometimes
international, labour processes. Adler (2007) believes the concept of “autonomy” is an anachronistic, inappropriate measure of the social relations of production in contemporary production, much of which is characterized by deep interdependence. Instead, he believes we are better served by examining the degree of “involvement” (or what alternatively be termed “participation”) in the design and coordination of collectivized work.

There is merit in Adler’s recognition that many complex labour processes, such as software development, demand deep interdependence and no one member is “autonomous” from others, and design and planning must be consciously and explicitly coordinated. Certainly, some might romanticize autonomy and draw misleading conclusions about decreasing power in workplace based on rising interdependence, but Adler here seems to be missing the spirit of concern with autonomy, and sets up a false dichotomy. Autonomy doesn’t become less important simply because of interdependence. Linking back to the discussion above about the situated, collective nature of labour processes, a group of specialist working on a project demanding extensive interdependence and frequent coordination can be working more or less autonomously as a collective to plan and problem solve. Management can give more or less “responsible” autonomy to the group as a whole. Certainly, the interdependent nature of much complex work creates additional uncertainty for those interpreting survey data: how are respondents interpreting questions on discretion? Do they interpret the question(s) as speaking only to personal autonomy in task-level planning or are they reporting high discretion where planning is a group activity? But the idea of autonomy, as the opportunity for
the application of knowledge free from detailed procedures and surveillance, is still worth retaining as a measure in the social relations of production.

These two dimensions of skill speak to power as it relates to specific, day-to-day activities. But complexity and discretion (or autonomy) give, I argue, only a partial and potentially secondary measure of “power” or control as it relates to class relationships and struggle. Too often they have served as the key indicator of workers’ individual or collective power. Complexity and autonomy can be the tools of managerial strategies to increase productivity where humanistic approaches are deemed more effective than routinization and fragmentation. Assessing task-level discretion is made further complex by the extent to which this “responsible autonomy” (or autonomy-control) is actually an indicator of genuine trust. Increased involvement and discretionary activity can result from trust, certainly, but involvement in design can also occur in an environment of rigid outcome-based management, passive surveillance, sanction-oriented peer-monitoring, and/or deep constraints based on specialization. Certainly both complexity and task-design involvement are important, and directly related to quality of work, and often depend on power within organizations, but I argue they are not enough. The question of the extent to which responsible autonomy—collective or individual—is genuine or superficial, suggest that further conceptual triangulation is appropriate if the concept of skill is to serve as a useful proxy for studying the social relations of production, in general, and the knowledge class, in particular.
Proposing a More Holistic Concept of (De)Skilling: Authority in Strategic and Operational Decision-Making.

Spenner notes that his conceptualization of autonomy-control is different than authority in the workplace, which he believes is less related to job content than to organizational structure. I argue, in contrast, that if skill is to serve as a valid barometer of workers’ and managers’ power the concept must include broader issues of authority and processes of decision-making. Authority is often distinguished from the more general concept of power, which may include influence via informal networks and other mechanisms. I use “authority” primarily in the formal sense. Authority is itself multidimensional: the concept is usually associated with formal structures of control over human resources—making subordinates behave in a certain way based on threat of sanction—and material resources—making decisions about strategic and operational matters such as budget setting, departmental structure, restructuring. The former dimension tends to be associated with traditional managerial roles. The latter dimension of authority, strategic and operational decision-making, often involves specialists in a fuller way. A major claim of the optimistic knowledge class theorists is that specialists are increasingly deferred to in making strategic and operational decisions. Such decisions can be further broken down into decisions that relate to one’s job and decisions that relate to the organization as a whole. Such a distinction is particularly important for understanding authority and decision-making within large, multidivisional organizations.

Many specialists have formal education and on-the-job experience that gives them significant insight and expertise into effective operational and strategic
thinking, be it in departmental reorganization, budget setting, personnel matters, product development and integration, marketing, project management, and so on. Spenner and many others appear to associate these strategic matters with “authority” and managerial prerogative, and not skill per se. Yet these are important aspects of skill, I believe. Planning and design (conception) at the level of one’s immediate job is really only a secondary process that occurs after decisions have already been made on product development, planning of services, budgets, analysis of overall workflow, and so on.

Braverman’s (and Marx’s) emphasis was not, to my reading, task-level autonomy or technical complexity. These are important but, in distinguishing between conception and execution, attention must also be paid to control over the entire labour process, where conception relates to the totality of the process leading to whatever sort of product or service. While Braverman may have romanticized craftwork, it is probably more useful to think of his worker—who conceived of a project and then completed it him- or herself—as an ideal type. Here, the division of labour is a Faustian Bargain of sorts. Even as the division of labour has provided specialists with a privileged position in the labour process, often involved in complex, problem-solving and/or planning activities, it has also provided management with a logic that potentially fragments specialists’ work, and removes many from the coordinating and administrative decisions that directly impact and

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101 Braverman’s was a class analysis; he was not as concerned with individual autonomy as with the broader relationship between management and labour, though of course understanding the broader relationship at an empirical level almost always begins with individualized data.
shape the decisions they make about their immediate job. This is not inter-occupational specialization, which gives shape to distinct occupations like programmer, engineer, teacher, and so on. Where scientific knowledge and/or the labour process are complex, specialization is normal practice, and logically based on the amount of time individuals do and are willing to stay in formal schooling. Nearly every occupation associated with the knowledge class—engineer, IT worker, doctor, teacher, scientist, and so on—engages in extensive specialization.

What I am referring to is intra-occupational specialization. For example, an individual at a mortgage lender may be focused on a single step in the evaluation of applications, the step might involve a high degree of complex statistical knowledge and the worker might have significant latitude over the sorts of data that are used in their calculations, but the person has knowledge of and is entirely capable of completing the entire mortgage-evaluation process themselves. Classic professionals like doctors and lawyers and even those who don’t fit neatly into any professional/semi-professional dichotomy, like engineers, have historically been involved throughout the entire process of a check-up, diagnosis, court case, project, etc. In contrast, intra-occupational division of labour is a slippery slope that may lead to both a) the detailed division of (intellectual) labour (which measures of complexity and design speak to) and b) centralization of planning and a decrease in specialists’ authority. The implication is that where an occupation can be fragmented (and not all can, at least with current technology), and even where it may remain complex and require discretion, the intra-occupation fragmentation is a “class process” that potentially separates workers from the conceptualization and
planning of the task/process as a whole. This job simplification and knowledge
capture allows the worker to be more easily removed from operational and strategic
decision-making. It is, for me, at the core of the concept of “deskilling.”

Certainly, the point at which specialization becomes fragmentation is difficult
to ascertain. A web developer is a distinct occupation from programmer, yet the
process of web development is frequently broken into discrete jobs, done by
different people: one (or more) develops and coordinates client-side tools like
HTML and java script while one or more different web developers works on linking
client-side tools with databases and web servers. Is this justifiable specialization, or
fragmentation? When work is further divided between web developers who work
only on HTML and others who work only on java script, again, is this specialization
or fragmentation? Just as with the question of the distinction between knowledge
and skill, drawing a definite line between fragmentation and specialization isn’t
what is really important. What is important is the point at which
specialization/fragmentation reduce overall control such that management can
begin to: 1) reduce technical demands and either replace a more highly paid,
technical worker with a worker with fewer credentials and less bargaining power or
reduce “rent” paid to the specialist in the position; and/or 2) reduce the specialist’s
knowledge of what is happening in other areas of the organization’s “charter” and
thus undercut any basis for claims for greater participation in strategic decisions.

Final Comments on Core Concepts

I have written so far in this chapter about class in general, as a construct for
studying social relations in capitalist economies. I have argued that to understand
class within a particular capitalist economy such as Canada’s one must dig below the owner-worker binary, with other (middle) classes theoretically and empirically possible. I have further argued that occupational groupings are a starting point for studying the class structure and that a closer examination of day-to-day relations in the labour process are necessary for ascertaining the existence and power of any knowledge class. Such a position suggests that a knowledge class is possible as a historically contingent phenomenon, one with interests opposed to capitalists and petite bourgeoisie and opposed to workers who lack specialized skills and have little voice in the design of work. But it also possible that the knowledge class exists but has interests that align with capitalists, the petite bourgeoisie, and less specialized workers. It’s also possible that workers with specialized knowledge have interests antagonistic to others with specialized knowledge (based on public/private sector and overlap). The relationship of specialists and managers is even less clear. Sometimes they are conceptually aggregated into one class, sometimes not. Many managers have specialized business skills (e.g., the “professionalization of management” via MBA programs) and many specialists end up moving into managerial positions in organizations producing goods or services that depend on complex and/or scarce knowledge. Ascertaining which potential set of relations most accurately captures the range of occupations associated with the knowledge class is difficult if one resides at the level of occupation only, even if supported by researched job descriptions attached to various job coding schemes. I move forward with the claim that to understand the class relations existing within Canada,
including the existence and power of a new knowledge or creative class, one must study in detail what is actually happening in workplaces.

**Hypothesis**

I acknowledge that advanced educational credentials and the possession of economically valuable knowledge are undoubtedly linked to wage premiums and elevated status, and specialist occupations continue to increase in number. My expectation, however, was that findings would show:

1) an increasing percentage of specialists and managers are vulnerable to the routinizing and centralizing tendencies that impact other employees, and that specialists are growing increasingly heterogeneous, both intra-occupationally and inter-occupationally; and as such
2) class boundaries between the capitalist elite and senior managers/top specialists, on the one hand, and specialists/managers and the working class, on the other, are too indistinct to make any defensible claim about a distinctive class.102

**Conclusion**

In this chapter I outlined a neo-Marxist approach to the study of class that is heavily influenced by Weberian theories of closure. My approach to closure is further informed by Sørensen’s work on asset specificity and (composite) rents. My approach rejects teleological approaches to the study of history, rejects the base-superstructure theory of social formation, and seeks to balance structure and agency in looking to class struggle as determining the shape of the class structure. But I note in concluding this chapter that I take seriously the call to engage in

102 My hypothesis did not propose a unilinear “proletarianization” of such occupations. What I proposed was that professionals, managers, etc. would show themselves to primarily exist in a spectrum of privilege and delegated authority between senior management/owners and the traditional working class.
ongoing theoretical reconstruction based on empirical testing. As Wright (1985) argues, against dogmatism and eclecticism “[w]hat is needed is a balance between theoretical commitment to maintain and strengthen the coherence of given general theoretical frameworks with theoretical openness to allow for concept transformation and theory reconstruction” (p. 23). Wright’s point is that class analysts (as should all researchers grappling with theory) must remain open to empirical findings that challenge and potentially falsify their theoretical constructs.
Chapter Five – Methods and Operationalization

Introduction: The “And” Research Strategy

Those practicing quantitative research have historically been at odds (Whipp, 1998) with those conducting qualitative studies. Guba and Lincoln (1998) describe this disagreement as first and foremost a rupture around paradigms. Those in the positivist and post-positivist traditions have depended largely on quantitative methods to apprehend a “real” reality and to verify or falsify hypotheses. In contrast, those oriented to critical theory ascribe to historical realism but their epistemology is transactional and subjectivist, leading to a strong affiliation with qualitative, dialogic methodology. In starkest contrast with the positivist tradition, radical constructivists accuse the dominant “scientific” approaches of naïve realism and a refusal to acknowledge that all research is value-laden. As such, the constructivist approach eschews quantitative research, instead focusing on the “construction” of meaning, multiple realities (relativism), and inductive reasoning.

While drawing attention to ongoing tensions between competing worldviews, Guba and Lincoln’s delineations tend to over-simplify the various paradigms, emphasizing aspects of incompatibility without exploring ways that paradigms and corresponding research methods might be brought together in useful and justifiable ways. In contrast to Guba and Lincoln’s claims of irreconcilability, many other researchers have been advocating more synthetic, conciliatory approaches. The combining of quantitative and qualitative is commonly referred to as “triangulation”: generically, the viewing of a phenomenon or
phenomena from multiple angles to gain a better “picture”. However, as Udo Kelle (2001) explains, the idea of triangulation varies from practitioner to practitioner. Out of the many nuanced uses, Kelle identifies three broad models of triangulation: 1) using different methods to strengthen claims of validity; 2) using quantitative and qualitative methods in a complementary fashion to gain a more sophisticated, robust understanding; and 3) the original trigonometrical sense as a necessary means to gain any understanding of a given phenomenon, not just to gain a “better” picture. The latter model appears restrictive, implying that quantitative or qualitative research performed separately is not useful. In practice and in theory the “validity” and the “complementary” models of triangulation are close cousins, their spirit of inquiry looking to use the best of both methodologies. Paradigmatic questions linger, however: are qualitative and quantitative methods to be conducted within an interpretivist/constructivist ontology or within a positivist/neo-positivist ontology?

One possible route through the impasse is what Gerald Cupchik (2001) calls “constructivist realism” (CR). Researchers in both the positivist and constructivist traditions often misrepresent the ontology and epistemology of those in the “opposing” camp, building arbitrary divisions, ignoring their own weaknesses, and disregarding commonalities. Cupchik writes that:

Even the concept of validity need not isolate the positivist and constructionist scholarly communities. Both communities express a concern for ecological validity, the extent to which a finding meaningfully reflects an event or process in the world. Both also bear the burdens of their doctrinal commitments. In the case of positivism, precise operational definitions can so deplete a phenomenon of its richness and texture that it all but disappears in the rush to actuarial prediction. On the other hand, constructionists can so link a phenomenon with a particular interpretive context that it runs the risk of being isolated within collective solipsism. The two communities therefore
have different albatrosses dangling from their epistemological necks. In the case of positivism, measurement can transform meaning into nothingness. For constructivists, the priestly use of impenetrable language can generate meaning, but only for the initiated. (p. 3, italics in original)

Cupchik argues that the distance between the two camps is not as great as feared (or wished). A reality exists “out-there”, beyond the world of the professional researcher, where people have little trouble distinguishing between “the real”—a broken arm, a snow fall, being fired—while simultaneously acknowledging the subjective nature of the social and personal world, and the struggle over the meaning of events. Both positivist and constructivist methods use abstractions to describe and understand social processes, both are selective in what they study and both “construct” interpretations of data. For those using quantitative methods, there must be a recognition that the world-out-there is largely indeterminate and that they are part of their research. Their methods gain precision and generalizability but are more limited and less subtle than the more holistic, rich data gathered from qualitative research. In the context of my own research, this “complementary” approach was generally a productive one. In studying changing social relations of production and processes of class formation, it is not enough to point to statistical variations in employees’ discretionary opportunities as “proof”. Nor is it enough to

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103 Limitations of both interview and survey data need to be recognized. In interviews, validity of findings is challenged by: the willingness of the participant to voice their beliefs (dependent on trust in researcher; the skill of the interviewer and the sorts of questions and probes that were raised; the limitation of language as an accurate expression of experience; and researcher bias when interpreting the transcripts. Analyzing survey results is also problematic based on interpreting how respondents understood the questions being posed, an issue recognized within the study of survey methodology.
depend on the “stories” told by employees. Instead, a more humble approach allows the survey data to “suggest” trends with interviews providing rich examples.

Data for this dissertation comes from original analysis of existing surveys as well as from original, open-ended interviews that I conducted in 2008 and 2009 with Canadians employed in engineering and information technology (IT) occupations. My methodological approach is one that does not privilege quantitative or qualitative data above the other, but rather, as explained above, considers them complementary. The quantitative survey data provided the opportunity for measures of knowledge and power in the workplace that can be used to make generalized inferences regarding shifting patterns in Canada’s class structure. The qualitative interviews provided the chance to examine in greater depth the relationships and organizational processes that impact on the formation and reproduction of power and class, and the meanings that workers make. Trends and patterns identified in the survey data were explored in more depth in the interviews. Thematic analysis of the interviews, including unanticipated findings, suggested new avenues of quantitative analysis.

The quantitative analysis depends mainly on two Canadian, nationally representative surveys: the 1983 Canadian Class Structure survey and the 2004 Work and Lifelong Learning (WALL) survey. A host of questions relating to working conditions, relationships of power, skill use, managerial responsibilities and other issues relevant to this project are directly comparable in the two surveys. In the following section I describe the data sources, explain my analytical approach
(including operationalization of key variables), and finish by outlining my rationale for combining quantitative with qualitative data.

**Quantitative Data Sources**

**Canadian Class Structure Survey**

The Canadian Class Structure (CCS) survey was conducted by Canadian Facts in 1983 under the direction of John Myles and Wally Clement, with funding from the Social Sciences and Humanities Research Council of Canada. The survey was associated with and was used in the international "Comparative Project on Class Structure and Class Consciousness" directed by Erik Olin Wright (see the merged codebook and further explanation of the comparative studies at: [http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/8413/documentation](http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/8413/documentation)). The survey, conducted in the U.S., Canada, Finland, Norway, Great Britain, West Germany, Denmark, Australia, and Japan, was designed primarily to analyze national class structures. The surveys provide rigorous, historical measures of the relational dimensions of social inequality, with emphasis on relations of authority, autonomy, and property. These data complement gradational measures of income, education, occupational status and other dimensions of inequality. Questions addressing the respondent’s location within class relations cover work-related issues such as supervision, decision-making, autonomy, organizational hierarchy, ownership, labour-market position, and income. Information on other aspects of social structural location includes occupation, industry, geographical location, sex, race, and ethnicity of respondents.
The Canadian survey includes 2577 respondents representing non-institutionalized, non-disabled adult population. Access to the database is currently public, with data held at the University of Toronto: http://www.chass.utoronto.ca/datalib/inventory/files/1168.txt. The codebook for the Canadian survey, to which question numbers below are linked, is available at http://prod.library.utoronto.ca/datalib/codebooks/utm/cscc/cscc.canada.cbl.

**Work and Lifelong Learning survey**

The Work and Lifelong Learning (WALL) survey is, like the CCS survey, nationally representative. It was conducted in 2003/2004 by York University’s Institute for Social Research, with funding from the SSHRC. The principal investigators of the general national survey on learning and work were D. W. Livingstone (University of Toronto), John Myles (University of Toronto), and Pierre Doray (University of Quebec at Montreal). The WALL survey provides profiles of the current work and learning activities of 9,063 Canadian adults from across the country. Work profiles include paid employment and also household work and community volunteer work. The examination of adult learning includes formal schooling, further adult education courses, informal training and self-directed informal learning. The survey permits various analyses of relations between work and learning activities. In contrast with conventional surveys of education and employment, the WALL survey pays greater attention to informal learning and unpaid work, and provides new evidence for development of fuller understanding of the general processes of change in learning and work relations. General topics covered include basic demographics, paid employment status, time use, volunteer
and household activities, formal and informal learning activities, barriers to formal learning, access to information technology, changes in the labour process, attitudes to current socio-economic issues, and social class and income.

The survey data was weighted using the 2001 Canadian Census so as to better match the general population with regards to age, sex, size of household, and formal educational attainment. The full explanation of the weighting procedures and the survey in general can be found at:

http://www.wallnetwork.ca/resources/wallcodebook.pdf. Questions were constructed so as to be comparable with a range of existing surveys, including the CCS. This comparability allows tracking of changes in key measures of job complexity, task-level discretion, and involvement in organizational decision-making. In addition, and as I describe in more detail below, occupations in both surveys were coded using the same system, the Canadian Classification and Dictionary of Occupations (CCDO). This meant that the same class variable, described below, could be used as an independent variable in analysing and comparing respondents.

**Operationalizing Class**

I use two class variables in my analysis of the survey data. One is a broad aggregation that distributes all employed people who participated in the surveys into one of eight groups; the other is a variable that uses only those occupations most commonly associated with the knowledge or creative class, disaggregating them into occupations. For the former I utilize a scheme developed by Livingstone (Livingstone, 1982; Livingstone & Mangan, 1996) that reflects the broad economic
and occupational relationships that formed in the industrial era and remain dominant (if in flux) into the early years of the 21st century. The structure, which self-consciously identifies “class locations” as opposed to making claims of distinct “classes,” is sufficiently granulated to provide insight into relations that emerge from both the division of labour within organizations (satisfying traditional Weberian concerns) and relations that emerge from ownership or non-ownership of the means of production (satisfying traditional Marxian concerns). The class map that emerges looks like this:

- Large business owners/senior executives
- Small business owners
- Self-employed
- Managers
- Supervisors
- Professionals (a group I henceforth refer to as “Specialists”104)
- Service employees
- Industrial employees

While owners are sometimes treated as a monolith in critical political economic analyses, those who are large business owners and senior executives of large corporations do not necessarily have interests identical to small business owners or the self-employed. The former are potentially more oriented to free trade and initiatives that lead to labour stability than small business owners or the self-employed. Managers, who frequently have voice in the design and coordination of

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104 While the actual logic of variable construction and the occupations included are more important than what the group is called, I prefer the label of “specialists” to “professionals.” It highlights the heterogeneity in level of professionalization among occupations included in the group, (hopefully) better alerting the reader to the full range of occupations included. The label also hopefully draws focus to the centrality of specialized knowledge in the debate over the knowledge class. No label is ever perfect, of course.
the labour process in addition to disciplinary authority over other employees, are distinguished from *supervisors*, who usually have only disciplinary authority. Non-managerial workers are separated first by degree to which their occupation suggests they perform specialized labour, and then by sector, leading to three categories: *professionals*, or what I below argue below are better designated *specialist employees*, who historically have been responsible for technical problem-solving, designing the labour process, conceptualizing new or revised products, and other creative, non-physical labour; *service employees*, including those non-specialists in sales, front-line service, and administrative staff; and *industrial employees*, who perform manual labour in manufacturing, extraction, or repair.

**Provisional Boundaries for the Study of the Knowledge Class**

In operationalizing the knowledge class, the main class variable created for both the CCS and WALL surveys collects a range of specialist occupations that includes but is not limited to classic professionals like pharmacists, social workers, psychologists, lawyers, doctors, engineers, economists, accountants, chemists, public school teachers, and others in jobs requiring post-graduate and/or professional certification. Included as well is a range of occupations conventionally known as “semi-professional” (as distinct from technical jobs, business support and other administrative occupations that are categorized with “service” workers). This includes those like IT workers, nurses, occupational therapists, interior designers, those teaching at universities but who are not full professors, musicians, writers, coaches, technical sales, real estate agents, physiotherapists, and those in fields like social work, law, and the social sciences who do not require a post-graduate
credential or professional certification. Why include those who are only partially professionalized, and even some who are at the margins of “specialist” occupations? Phrased in a different way, should classic professions like lawyers and doctors be separated out from professionalizing or purely technical occupational groups?

Professions have traditionally been identified via the existence of four main features: control over a specialized body of knowledge, control over access to the profession, the existence of an association or union, and the necessity of a license, certificate, or advanced credential to enter the occupation. Archetypes here include doctors and lawyers. The conventional designation of “profession” is, however, attributed to a range of other occupational groups that vary in meeting such criteria. Evetts (2003, 2006) has performed a number of meta-reviews of research and theories on professionals and, following the original insights by Hughes (1981) in the late 1950s, concludes that any itemized, formal distinction between “professionals” and other expert occupations is deeply problematic. More useful, Evetts argues, is to approach the distinction as one of “degree rather than kind” (p. 134):

[I]t no longer seems important to draw a hard definitional line between professions and other (expert) occupations. The operational definition of profession can be highly pragmatic. The intellectual field includes the study of occupations that are predominantly service sector and knowledge-based and achieved sometimes following years of higher/further education and specified years of vocational training and experience. Sometimes professional groups are also elites with strong political links and connections, and some professional practitioners are licensed as a mechanism of market closure and the occupational control of the work. (pp. 135-136)
Evetts (2006) proposes that professionals be divided into at least two groups: occupational and organizational professionals. In contrast to the attributes of classic “occupational” professionals:

> [o]rganizational professionalism is a discourse of control used increasingly by managers in work organizations. It incorporates rational-legal forms of decision-making, hierarchical structures of authority, the standardization of work practices, accountability, target-setting and performance review and is based on occupational training and certification. (p. 140)

Analyzing doctors and lawyers (as one category due to limited numbers), engineers, teachers, nurses and systems analysts, Livingstone and Antonelli (2006) find specialists of all sorts are increasingly embedded within large organizations, with over half of respondents indicating they work in an organization of over 500 people. The variation in membership in professional association or union is particularly striking, and illustrates the very different levels of “professionalization” among occupations frequently designated a profession. Doctors and lawyers are largely members of professional associations (over 80 percent), about two-thirds of nurses belong to an association, about half of engineers and teachers belong, but only 10 percent of systems analysts are members of a professional association. Concerning union membership, teachers and nurses appear to have some dual association, with over 80 percent belonging to unions. Very few of the other “professions” are members of unions.

105 This is a trend recognized in a variety of reviews and studies related to specialized labour (Goyder, 2005; Pool, 1997). Brint (2001) makes a claim based on his research that within professional occupations a shift is occurring from self-constructs as “social trustee” committed to public service to one of “expert professionalism” involving command of technical skills (frequently business/efficiency knowledge) and importance of one’s market value.
The lack of clear differentiation isn't just between classic professionals and others who we might call semi-professionals. The understanding of difference between technicians/technologists and specialists, and between technicians/technologists and less technical occupations, is not nearly as developed as it could be (Barley, 2005). Many “technicians” and business support employees are, in their own right, specialists but lack the status or occupational-closure that creates artificial labour shortages enjoyed by some semi-professions and many classic professions.106

The main class variable does not include technologists and business support occupations in the specialist group, even though they are frequently included within visions of the knowledge class (or at least inside the house but stuck on the stairs). Going back to very early conceptualizations of knowledge workers, Machlup proposed that any occupation that generated knowledge is to be considered a knowledge worker. More recently, Florida’s “creative class” includes business and financial operations occupations, technical occupations in the health sector, technical sales, and any occupation in the areas of: computer and mathematics; architecture and engineering; life, physical and social sciences; education, training, and libraries; and arts, design entertainment, sports and media. Excluding

106 Frequently technical workers exist in liminal positions in the division of labour, as expressed in the differentiation between “buffers” and “brokers” (Barley, 2005, p. 391). Both buffers and brokers share a common “epistemic core” in that they take care of physical systems and translate aspects of those systems into symbolic representations fit for consumption and use by management and other technicians. But “buffers” work between specialists like scientists and engineers and the physical systems that such specialists possess theoretical knowledge about. “Brokers,” on the other hand, liaise between communities of specialists (and advanced technology) and communities of users and/or management who have little or no technical knowledge.
technologists and business support occupations in the aggregate class variable reduces the chances of conflation, however, and keeps the focus on the specialists who are at the heart of knowledge class theorizing. With the goal of comparative analysis, however, technicians and business support staff are included as a separate group in the disaggregated class variable introduced below.

The specialist category excludes managers (of any educational background, including specialists who have moved into management) and specialists who own their own business. Canadian evidence\textsuperscript{107} (Livingstone & Antonelli, 2010) indicates substantial heterogeneity in owner-employee status between and within a number of occupational groups associated with the knowledge class. Of central importance to understanding professionals both as a group and their working conditions, argue Livingstone and Antonelli, is the “employment class” that a professional belongs to: professional owners, professional managers, or professional employees. This more nuanced approach allows a fuller examination of “professional” occupations, including those that are “professionalizing” and may possess only some of the qualities and benefits enjoyed by full professionals like doctors and lawyers.

In my research, and in the class variable being described, the specialist occupational group includes only employees. “Professional” owners are selected out and included in the self-employed, small business employer, or large business employer. While some of the new class theories reviewed earlier include managers

\textsuperscript{107} The study uses the Working and Lifelong Learning (WALL) survey, the same survey I depend on later in my Findings.
in this class (e.g., Eirehreich’s “professional-managerial” class and Florida’s “creative” class), to include managers would be to presuppose sameness of interests and class location and remove the opportunity for comparative study. As with technologists and business support staff, in the disaggregated variable below I include—where relevant—managers in specialist occupations.

**Disaggregating the Specialists**

As Giddens (1973) has noted, all class analysis involves decisions around aggregation. The question of the level of occupational aggregation continues to be a source of debate in the study of class, with traditional Marxian focus on “big” classes challenged by those renouncing any aggregation beyond the level of specific occupations (Grusky, 2005). I am sympathetic to the disaggregation argument, for only through such fine grained analysis can one begin to study in earnest the working conditions and relations that allow various jobs to be validly aggregated into broader occupations, and only through such disaggregation can robust theories of a knowledge class be built and defended. Disaggregation and aggregation of occupations need not and should not be exclusive approaches. As Wright, Goldthorpe and others have made evident, class analysis is strengthened (that is, theories and claims better evaluated) where large classes can be justified with evidence that the included occupations do possess similar interests and conditions.

In disaggregating specialists, a range of approaches have been suggested by theories and research already presented. Lavoie and Roy (1998), who earlier provided data on the expansion of knowledge work in Canada, disaggregate knowledge workers by occupation and then re-aggregate into the following
categories: pure sciences, applied sciences, engineering, computer science, and the social sciences and humanities. Baldwin and Beckstead (2003) also disaggregate and then re-aggregate into: education; social sciences; medicine and health; law and jurisprudence; writing; and natural sciences, engineering and mathematics. They, unlike Lavoie and Roy, include a category of managers and administrators.

Brint (1994), in contrast, breaks contemporary professionals into five groups: 1) the *business services sphere* (consisting of financial analysts and corporate lawyers, for example); 2) the *applied sciences sphere* (made up of engineers and geoscientists, among others); 3) the *culture and communications sphere* (which includes academics, journalists, and media professionals); 4) the *civic regulation sphere* (embodying, for instance, judges, government administrators, and interest group experts); and 5) the *human services sphere* (made up of teachers, social workers, nurses, and the like).

There is certainly face validity to the approaches above and they informed my effort to disaggregate the specialist category. The categories I use are driven by theory but make some minor, pragmatic concessions. In seeking to disaggregate but still have sample sizes large enough that I could generalize, I ended up with a mix of categories and specific occupations:

- Accountants & Business Analysts,
- Engineers,
- Teachers,
- Nurses,
- Arts & Culture,
- IT Workers,
- Other professionals / specialists, and
- Technologists & Professional Support
The mix of occupation and category is, I realize, not ideal, but I believe the mix of categories and occupations allow the most insight possible under the circumstances. The category of “Other professionals / specialists” is the most problematic, being a grab-bag of doctors, lawyers, scientists, and health care professionals who exist in such small numbers in both surveys as to be meaningless unless grouped together. In contrast to this weakness, among the individual occupational groups that I am able to break out are included the two occupations (engineering and IT workers) that I focus on in my qualitative research in Chapter Seven. Where possible, in presenting data on the disaggregated specialists I include those who are “Managers in Specialist Fields.” This category provides a point of comparison with Beckstead and Baldwin and with Florida, who include amongst their knowledge workers and creative class, respectively, specialists who have moved into managerial roles. Again, in the samples of the CCS and WALL surveys there simply are not enough specialist managers from each of the other specialist groups to compare (e.g., engineering managers or school principals).

Creating the Class Variables

The major class variable that emerges from the operationalization described above was first developed in the mid-1980s for analysis of the OISE/UT Surveys of Educational Issues. Classes are constructed based on respondents’ self-reports of:

- occupation – job title and/or description of work;
- ownership status; and
- size of organization owned.

The creation of the major occupational groups is a two-step process, and includes only those who were working at the time of the survey. The first step is occupational
sorting based on the 1980 Standard Occupational Classification (1980 SOC). Identification as manager, supervisor, professional/specialist, service or industrial worker emerges from step one. The second step reassigns individuals based on ownership and size of organization. Those business owners with no employees are deemed self-employed, those with less than 250 employees are classified as small employers, and those with more than 250 employees are classified as large employers.

Among the employee groups (excluding managerial/supervisory status), identification as specialist, service or industrial is constructed using 4-digit 1980 SOC unit codes only. Categorization of employee locations is then performed using education and skill requirements associated with the occupation, as reflected in the minor group (7-digit codes) and unit group (4-digit codes) titles in the 1980 SOC. Categorization is justified by education and training requirements identified in the Canadian Classification Dictionary of Occupations (CCDO), specifically the General Education Development (GED) and Special Vocational Preparation (SVP) scales.

A new National Occupational Classification (NOC) coding system now exists. Instead of describing jobs in terms of job duties and industry category, as the SOC does, the NOC uses skill levels and skill types to categorize occupations. Unfortunately, the 1983 CCS survey is only coded for the SOC. The switch to the NOC meant that to compare the 2004 WALL survey with the 1983 CCS, the WALL survey

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108 The 1980 SOC is based on the original Canadian Classification and Dictionary of Occupations (CCDO) codes: both have been replaced by the National Occupational Classification (NOC). See the description in the following section of the differences between the CCDO and the NOC.
had to be coded for both SOC classifications and NOC classifications. Survey data presented in this dissertation depends wholly on SOC codes for its ability to provide historical comparison. This is, obviously, not ideal, as NOC is superior; however, the occupational groupings used in this project are sufficiently course-grained that the shortcomings of the SOC, CCDO-derived system are mostly mitigated. For example, the NOC adds a range of IT jobs that did not exist when the CCDO was created, but my analysis is constrained by the number of participants and I cannot and do not disaggregate IT occupations.

**Operationalizing the Dimensions of Skill**

I have traced the contours of the debate over the measurement of skill, and its dimensionality, presenting theory and empirical evidence on the danger of assuming changes in skill and power in the workplace based on occupational coding. Certainly, the occupational coding systems used in the data above are more sophisticated and nuanced than what has been described as “non-measurement” approaches (see Spenner, 1983); at the same time the imputed skill and responsibility levels attached to various occupations do not provide us with “direct” evidence. The surveys I depend on here include such direct measures and I use them to enhance understanding of the social relations of those occupations commonly associated with the knowledge class.

**Measures for Studying Complexity, Control and Authority in the Labour Process.**

Most measures I focus on are comparable across the WALL and CCS surveys. The majority of my measures focus on technical complexity, autonomy-control, and
organizational decision-making. Others provide insight on occupational closure, organizational change, and the introduction of new technology.

**Technical Complexity.**

**Formal educational attainment:**

Respondents were asked about the highest level of formal education they achieved. Results were aggregated into: high school or less, some college, college completion, some university, undergraduate, and post-graduate/professional degree. See CCS Q100A\(^{109}\); WALL s6_1.\(^{110}\)

**Education required for job entry:**

Respondents were asked what general education is required for new applicants or for people who want to do the type of job they do. See CCS Q65;\(^{111}\) WALL s19_3.

**Education required to perform the tasks associated with one’s work:**

Respondents were asked what general level of education is really needed to perform the tasks of their job. See CCS Q65; WALL s19_4.

**Underemployment**

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\(^{109}\) See [http://prod.library.utoronto.ca/datalib/codebooks/utm/cscc/escc.canada.cbl](http://prod.library.utoronto.ca/datalib/codebooks/utm/cscc/escc.canada.cbl) for the CCS codebook.

\(^{110}\) See [http://www.wallnetwork.ca/resources/wallcodebook.pdf](http://www.wallnetwork.ca/resources/wallcodebook.pdf) for the WALL codebook.

\(^{111}\) The questions from 1983 and 2004 on educational requirements for work were different in wording. The 1983 question (Q65) was more vague, asking about “schooling required for type of work” and not differentiating between, as the WALL survey does, education for entry (credential) and education to actually perform one’s job (performance). See Table 6.1.
Underemployment is measured in a number of ways ("triangulated") to achieve greater validity. Formal educational attainment is compared, separately, with: 1) job entry requirements; 2) education required to perform job; and 3) self-perceived overqualification (see WALL s19_6). Together, these measures offer additional, often ignored insight into unused capacity.

On the job training necessary to become competent at one’s job

This is the measure conventionally known as Specific Vocational Preparation (SVP) and asks respondents how long it took them before they felt they were proficient at their work. See CCS Q66; WALL s19_7.

Change in Technology

The 2004 WALL survey included a question (s21_2) that asked respondents about the extent to which techniques and equipment (e.g., computers and software programs) used on a regular basis had changed over the last five years.

(Task-level) Autonomy-Control.

Opportunities to design work

This question asked respondents about the chance to design their work, with the 2004 WALL survey further specifying if the respondent was able to design their work or the work of others. The 1983 survey also asked two separate questions. The first asked if the respondent was “required” to design their work (Q45); if they said no they were then asked if it was “sometimes possible” for them to design their work (Q46A). The 2004 survey
included only one question with an ordinal scale (s20_1). The correspondence between the 1983 survey and 2004 survey are not exact but close enough for comparison.

**Thought and attention demanded by job**

This question on the thought and attention demanded by one’s job was also slightly different in the two surveys, but again close enough for comparison.

In the 1983 survey, the ordinal list for Q70 gave respondents the following choices: little thought, simple thought, simple problem solving, difficult problem solving, and complex problem solving. In the 2004 survey, the ordinal list for s20_2 on thought and attention one’s job normally demanded gave respondents the following options: a great deal, a moderate amount, a little, or none at all.

**New learning**

Concerning the need to learn new skills to perform one’s job (s20_5), the WALL survey asked respondents to strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree or strongly disagree. The 1983 CCS survey did not ask a comparable question.

**Increase in skill complexity to complete work**

The 2004 WALL survey asked respondents if, in the last five years (1999 through 2004), if the level of skill to perform their work had increased, stayed the same or decreased (s21_1). The 1983 CCS survey did not ask a comparable question.
Organization-level decision-making.

Participation in operational and strategic organizational decisions

The 1983 survey asked respondents if they “participate in policymaking decisions” (Q80). A “yes” led to a series of specific questions (Q81A through Q81G) related to number of employees, change in products, pace and amount of work, changes in procedures, changes in overall budget, and distribution of budget. For each, respondents were provided an ordinal list: 1) yes, make decision; 2) yes, group decision; 3) yes, begin decision; 4) yes, advice only; 5) no decision; and 6) not an issue. For the 2004 WALL survey, question s20_3a asked about participation in policy-making at work, includes “products or services delivered, total number of people employed, budgets, and so forth.” A yes response led to question s20_3b that asked if the respondent makes decisions themselves, as a member of a group, subject to approval or if they only provide advice. To make the questions from the two surveys comparable, a variable for the 1983 questions was created that used an average for answers Q81A through Q81G to assign respondents to one of: 1) make decisions, group decisions, subject to approval/begin decision, advice only, or no decision-making. If the respondent answered no or not an issue to all the follow-ups for the CCS survey, they were re-designated to the “no decision making” category.

Organizational and occupational variation.

Size of Organization
Both the 1983 CCS survey (Q36) and the 2004 WALL survey (s17_6) asked respondents about the number of employees in their organization.

**Labour relations**

Respondents in the 1983 survey were asked if they are a member of a union or collective bargaining association (Q86C). Respondents in the 2004 survey were asked if they belong to a union (s17_9) or to another organization that represents members of their occupation (s17_10). For the WALL survey, the two questions were combined into a single variable.

**Analysis of quantitative data.**

My approach to statistical analysis is one that statisticians may find frustrating. My skills in statistical analysis are relatively rudimentary; while I understand and can perform regressions and basic multivariate analysis I struggle to critique social science research that uses such tools. That is, I am unable to feel confident in assessing the validity of the conclusions the researchers are making. My goal is to present the data in a way that lets all readers engage with the survey findings and make judgments on whether or not they agree with my interpretation. As I note in the Conclusion regarding future research, I realize this is a limitation in light of the range of variables I use and multivariate analysis would be helpful for teasing out causal factors in a more economical way.

**Qualitative Data**

I argued in Chapter Four that the grounding of class in the labour process, and including a multi-dimensional approach to skill, necessitates a methodological approach that shuttles between macro- and micro-level analysis, between general
trends and historical, geographical and sectoral variation. If class analysis is to make an honest effort to connect to empirical evidence from the labour process, and to avoid being a simple exercise in occupational arithmetic, then research must connect the quantitative research, which allows for generalizability, and quantitative research, which provides the rich stories and “depth” necessary to evaluate various theories. Below I describe my research strategy that seeks to meet the criteria above.

**Why Engineers and IT Workers?**

Why focus on a comparison of engineers and information technology (IT) workers as subsamples of specialists? There are, I believe, strong similarities in the outcome of the activities of engineers and IT workers. Both groups increase human control over physical constraints, applying (pure) scientific principles and research to practical problems and needs. Both create, maintain and extend wondrous technologies of exploration, health, knowledge storage, production, and communication.\(^{112}\) Engineers are largely focused on tangible items that dig, cut, process, mix, hang, manufacture, and so on. Engineers were central to the Industrial Revolution and continue today to expand human control over nature in fields like robotics, bioengineering, nano-engineering, alternative energy, and even climate (or geo-) engineering. IT workers also increase human ability to control space and time through digitized tools. Many IT workers are focused on the software side, designing

\(^{112}\) In this respect, engineers can point to a much longer history, with deep connections to empire building, wars waged, cities nourished, and so on, though IT workers have rapidly assumed an equally central place in these sorts of endeavours.
and maintaining systems for storing vast amounts of information and creating algorithms for collecting and analyzing data that would otherwise take massive amounts of human travel, collating, and extensive statistical operations. Other IT workers are engaged more directly with the hardware that allows the software to do its work; tasks include data protection, maintaining server “farms” for enterprises or for corporations offering “cloud” computing, connecting local networks, and connecting all of these to the Internet. Software engineers clearly bridge the two groups, and their status as “engineers” remains uneven within Canada and other countries.113

In terms of their role in the capitalist system, engineers and IT workers are at the centre of efforts to increase productivity and competitive advantage. Both groups have also been key to the search to improve or find new products and markets in the compulsive push to commodification and efficiency that characterizes capitalist societies, especially in advanced ones like Canada. The importance of design and redesign is only growing in importance as complex technology infuses nearly every vendible product and service (e.g., “smart” appliances, small batch manufacturing, semi- and fully automated customer service phone systems, programmable children’s toys, computers in automobiles’ engines, and so on). Both IT workers and engineers are trained to and capable of improving

113 Software engineers present a bit of an operationalization conundrum. Are they IT workers or engineers? The answer is that they are both, though increasingly they are, in Canada at least, being drawn into the closed occupation of engineers via training and licensing, though unevenly across the country. Computer engineers are coded with “engineers” in my specialist disaggregation, though there are few that show up in the sample. As well, I don’t interview any computer engineers. The issue of what occupational group they conceptually and empirically belong with is interesting and suggests further research.
efficiency on specific projects and concerning a single product or process, but are also expected to make technical decisions based on organization-wide strategies, external market conditions, and within budget constraints. Their work in the private sector largely fuses science and commerce. This is becoming increasingly so, too, in the academic setting where the pressure to commercialize innovations is mounting and in the public sector where pressure for accountability and cost cutting technologies is also increasing (think of “customer” service portals on government websites, automated city parking lots, and self-loading recycling and garbage-collecting vehicles).

The abilities listed above are the most visible functions of engineers and IT workers, the basis of their privileged place within organizations, and a key tenet of theorizing on knowledge workers, the knowledge class, and (now) the creative class. But, of course, their work also has implications for other workers. The technologies emerging from the efforts of engineers and IT workers make the jobs of some non-specialist workers more interesting and less physically taxing. But members of both occupations also build the tools used to routinize, automate, and surveil the work of others. As explored in the literature review, both engineers and IT workers have thus also been central to capitalists’ and their delegates’ efforts to maximize control (e.g., centrally, technologically controlled manufacturing and IT infrastructure) and minimize labour costs (e.g., automation, relocation to locations where labour is cheaper).

While the work of engineers and IT workers intersect in the ways identified above, there are also important differences. In Canada, the two occupations differ in
degree of professionalization: control over occupational knowledge, self-regulation, the need for a credential to practice and for advancement, and control over access to the profession (including graduate numbers and evaluation of immigrant professionals). It is worth emphasizing that the two occupations are, of course, not internally homogenous in their application of science or approaches to (re)designing technology. For engineers, deep divisions exist around risk assessment, the environmental impact of engineering work, and the privatization of knowledge in patents (Pool, 1997). Among IT workers, the issue of privatization of knowledge in the form of copyrights as well as patents also forms a primary cleavage, with Open Source and CopyLeft two of the more well known movements pushing against the status quo (Kleinman, 2005). These movements continue to carry the torch of the original hackers’ libertarian spirit.

**In-depth interviews**

During 2008 and 2009 I contacted IT workers or engineers who participated in the 2004 WALL survey and indicated they were agreeable to be contacted later. Simultaneously, I used networks (i.e., snowball sampling) to connect with engineers and IT workers who would be willing to talk with me. Twelve interviews were conducted, with six participants from each occupational group. The participants varied in age, sex, race and sector, all important contextual differences that I attempt to account for in examining the data from the interviews. The in-depth interviews were planned as semi-structured. An interview guide was developed that included a range of key questions along with follow-up questions (see Appendix E). Interviews took place either over the phone or in-person at a location agreed upon
by the myself and the participant. Most interviews did not follow the interview guide, ending up largely open-ended and non-linear. This was due, as the material in Chapter Seven seeks to show, to the interconnectedness of various issues related to technology, control, organizational structure and occupational closure. Often a participant’s response on, say, their opportunity to make decisions about their specific job (“autonomy-control”) involved issues of job complexity and technological change. As well, probes would often draw the conversation further from the predefined structure of the interview guide. The interviews ranged in length from around an hour to more than four hours (over several conversations) and provided a large amount of rich data on the working lives of the engineers and IT workers I spoke with. A number of engineers and IT workers agreed to multiple interviews that allowed me to track various organizational and career changes. I interviewed six Canadian engineers, four from central Canada and two from Western Canada. The group included five men and one woman. One is an immigrant from China, the rest of the engineering participants are Caucasian and born in Canada. I interviewed six Canadian information technology (IT) workers, all from Ontario. Four of the six reside in the Greater Toronto Area, one works in a medium sized city in Ontario and another works in a small Ontario town. The participant group included four women and two men. Nearly all were between 35 and 44 years of age. The group included two people of Asian descent, the rest are of Caucasian origins. All were born in Canada except for one who immigrated with his family when he was very young.
Both the engineering and IT groups I spoke to are not identical in composition to the broader occupations they are a part of, and this will be taken into account in the analysis that spans the next three chapters. But the two groups are similar enough, I propose, across a range of characteristics to allow me to use their experiences of work and work change in an inductive fashion. Of course, as I have done above, and explained earlier in this chapter, throughout the analysis the specificity of experiences described by my participants is contrasted and evaluated against generalizable survey data.

Analysis

Analysis of the qualitative data was conducted using a thematic approach. Initial themes were drawn from the literature, relating to the social relations of production and class structure, include the: opportunity to apply knowledge to one’s job or to organizational decisions, complexity of work, the match between knowledge attainment and knowledge requirements, covert and explicit surveillance, labour intensification, and attitudes towards workplace restructuring. Data was analyzed thematically in two stages. In the first stage, an open coding approach was used to identify critical terms, key events and/or processes in a flexible and rough manner. The second pass through the qualitative data was highly selective, identifying “key” examples of themes and looking for connections and patterns between themes, issues, and phenomena.
Part Three – Findings
Chapter Six – Problematizing the New Class

Introduction

In this chapter I present survey data on formal education, complexity of work, job autonomy-control, and involvement in organizational decisions. The point is to evaluate the claim that, in an advanced capitalist country like Canada, a distinct knowledge class exists and is assuming increasing dominance within the social relations of production. My presentation of findings in this chapter moves from the more aggregated (professionals and semi-professionals as one “specialist” group) to the less aggregated (comparison of specialist occupations and small aggregates). I approach the survey data both cautiously and critically, anticipating the interview data in the next chapter that both enriches and problematizes the quantitative data from this chapter.

The survey data is provocative; findings indicate that skill requirements have been increasing for all workers, especially non-specialized, non-managerial employees in the service and industrial sectors who make up the traditional “working class.” In fact, on all measures (complexity, autonomy-control, and involvement) the working class made large gains between 1983 and 2004. A paradox appears, however, for specialists and managers; overall they experienced a decline in autonomy-control but an increase in involvement in strategic and operational decision-making. The decline in autonomy-control for specialists and
managers does not appear to be a function of an influx of workers (women, younger workers, visible minorities) or occupations (technicians and semi-professionals) who have historically experienced higher levels of subordination as men in the same job. Rather, I argue the decline is a function of alterations in the labour process of specialist and managerial occupations, and could be linked to the rise in job planning among the working class though this is unclear. Increasingly, specialists are working in large organizations that have traditionally depended more heavily on bureaucratic structures and exist in more mature industries and fields. These findings present a much more complex, nuanced picture of changes in the social relations of production and the class structure than can be accounted for by theories associated with Braverman (i.e., a steady degradation of work) and optimistic new class theorists (i.e., expanded job control for specialists).

Disaggregating the specialists, findings indicate significant heterogeneity in autonomy-control and decision-making involvement. For example, engineers and IT workers—both of whom depend on technical knowledge to build and maintain sophisticated tools—report very similar opportunities to design work but engineers have much greater voice in organizational decision-making. The discrepancy between engineers and IT workers provides a prominent subtext for Chapter Seven where I introduce findings from my interviews. This qualitative data allows me to explore in more depth obvious reasons for differences between these two technical occupations (e.g., occupational closure) and not so obvious reasons (e.g., technology as tool v. labour process). In Chapter Eight, my Discussion, I more fully integrate my quantitative and qualitative data, engage directly with questions of closure and
exploitation, and evaluate which (if any) of the theories on the labour process and class boundaries best explain my findings. I conclude my introduction by briefly reviewing the core premises of optimistic knowledge class theorists, which shape the logic of the presentation of my survey findings.

**Core premises of optimistic knowledge class theorists.**

At a basic level, there is broad agreement among “new class” theorists that the social relations of production are being altered as the knowledge-base of administration, extraction, production and distribution has shifted with advances in the communication, biological, and chemical sciences, and life-cycles for commodities like digital information technology grows shorter. The implication for the existence and power of a knowledge class is at issue. While acknowledging the variety of new class perspectives in Chapter Two, my main target of critique has clearly been the most optimistic of the new class theories that dominate political and economic thought, as articulated by Daniel Bell, Richard Florida, Peter Drucker and others. Below, I have developed a series of premises based on the work of these latter theorists:

1) **Economy**: The pace, uncertainty, knowledge-intensity, and advancements in technology in the emerging post-industrial, global economy are rapidly increasing the demand for scientific and technical knowledge;

2) **Number and Education**: This deepening of techno-scientific knowledge in production has meant a substantial shift towards highly educated professional, semi-professional, and technical occupations (who I call “specialists”);

3) **Activity**: The work of these specialists demands codified and tacit knowledge that is complex but also not easily acquired and must be constantly maintained or upgraded through frequent learning. The intellectual nature and high levels of uncertainty in the tasks performed by specialists mean their jobs are not easily routinized or closely managed;
4) **Power/Authority:** The routine-resistant nature of specialists’ work, combined with a scarcity of those with the ability to do this work (human capital) and the centrality of specialists’ knowledge to effective strategic and operational decision-making, means that their power within the labour market and within the productive domain is significantly high and growing;

   a. As a consequence, many organizations, particularly knowledge-intensive ones, are compelled to transform themselves, leaving behind bureaucratic rigidity and centralization, task-level managerial oversight, and standardization;

   b. Put another way, the techno-scientific knowledge (specific and general human capital) “owned” by specialized workers is so scarce and so central to their organizations’ success that issues of occupational closure and/or professional association or unionization are becoming irrelevant to specialists’ ability to maintain or increase control over their work.

5) These changes in relations and forces of production have created a distinct category of specialist employee who form a distinct class with the power to control the conditions of their work.

There is little argument that Premise 1 (economy) is true. Premise 2 (number and education) is also by-and-large valid, even if compositional changes are not as rapid or to the degree assumed by knowledge/creative class theorists. The problem, as argued in Chapter Four of this thesis, is that many theorists read off Premise 3 (activity) and Premise 4 (power) from Premise 1 and/or Premise 2. Even where researchers try to build a more direct empirical foundation for understanding the activities of specialized labour (Premise 3), far too many depend on proxies like credential requirements that have been shown to mask substantial heterogeneity in

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114 If class is relational, then the number within a knowledge class isn’t a criteria for whether a class exists or not but is important for understanding broader political economic change, and if capitalism is creating high quality jobs and shedding low quality jobs.
actual work activity and power. While wage disparities offer another assessment of power, it too is a problematic proxy as it can conflate “loyalty” pay with power. Formal education, credential requirements for entry to a given occupation, and wage are, I have argued, important but insufficient proxies for understanding the day-to-day working activities of Canadians, and provide only a partial basis for ascertaining current or emerging relations in the workplace, let alone serving as a basis for claims of a powerful new class.\(^{115}\)

**Evidence on Job Complexity**

As described earlier, the Canadian economy has experienced a series of shifts in occupational composition, sectoral dependence, and commodity focus that is roughly similar to most advanced capitalist countries. Job growth has primarily been in the service-sector, with increased numbers in managerial and highly skilled professional, semi-professional, and technical occupations.\(^ {116}\) Simultaneously, digital technologies have penetrated nearly all labour processes but their impact on skill requirements continues to be an open question. To what extent are managers and specialists’ formal knowledge and capacity for creative action actually being

\(^{115}\) This is a stone that should not just be cast at those who draw optimistic conclusions on the trajectory of quality of work and class relations. More critical researchers on work and class often make the same sort of leaps from occupational data, education, and (less so) pay to the social relations of production. As I have argued, labour process and critical organizational research over the last thirty plus years has been dynamic even as it diverges into competing and sometimes incompatible foci; despite a lack of consensus, or perhaps because of such diversity, the field provides superior conceptual and methodological signposts for the critical study of these “everyday” relationships among and within various occupational groupings.

\(^{116}\) Findings from the 2004 Work and Lifelong Learning survey suggest that 40% of specialists are in the private sector, 42% in the public sector, and the remainder are spread throughout government-owned (or crown) corporations and non-profit organizations. While specialists continue to be less likely to be in the private sector than other occupational groups, their numbers there are growing. In 1983 just 27% of specialists were employed in the private sector.
called upon in a regular way, to what extent are they able to control their immediate and broader environment, and what can these measures tell us about changing social relations of production and changes in the class structure?

As noted above, formal educational attainment has been a long-time, widely used indicator of the rising knowledge-intensity and intellectual complexity of jobs. While there are limitations to using attainment as a measure of job complexity and social relations of production, as detailed earlier, it is still an important measure for identifying the capacity of the workforce and provides a starting point against which more direct measures can be compared. What is evident in Figure 6.1 below is a massive overall expansion of participation in tertiary schooling between 1983 and 2004 (Zhao, et al., 2000).\textsuperscript{117} The overall growth in attainment appears driven primarily by those entering non-specialist service and industrial occupations. This is not particularly surprising considering education’s role in increasing workers’ mobility within dynamic and competitive labour markets, and the simultaneous expansion in post-secondary opportunities.

\textsuperscript{117} The findings from the WALL survey correspond closely with general findings on educational attainment using Canadian Census data.
The main point to be taken from Figure 6.1 is that post-secondary educational attainment remains high among specialists and managers, and has increased dramatically within other broad occupational groupings. The expansion of post-secondary attainment can really only tell us about potential, however, and is a weak indicator of the actual activities of workers once they reach the workplace; attainment must, then, be analyzed in conjunction with more direct measures of the use of education.

The data in Table 6.1, below, includes measures of post-secondary credential attained (reproducing the data from Figure 6.1 above), various measures of requirements and use, and levels of underemployment that emerge from each
measure of requirement and use. All measures in Table 6.1 are based on self-reports. Amidst the rather large amount of data in the table I want to highlight two significant trends in attainment and use of formal education. The first is that the education needed to perform work appears, generally, to have increased significantly for wage and salary earners, if we assume that the 1983 measure approximates the performance requirements for that era.\textsuperscript{118} This is the first of many findings in the chapter that point toward depolarization in job complexity based on upgrading for service and industrial workers (traditionally grouped into the “working class”). The second trend is that educational attainment has outpaced the rise in performance requirements, and underemployment by any of the 2004 measures is, overall, higher that that reported by respondents in 1983. In terms of schooling required for work, the massive discrepancy visible in 1983 between managers and specialists, on the one hand, and supervisors, service employees and industrial employees, on the other, continues in 2004 despite a roughly doubling in performance requirements for service employees and more modest increases for supervisors and industrial workers. Most relevant to this project, however, are the

\textsuperscript{118} As noted in the methodology chapter, for 1983 there is only one measure that asked respondents what level of formal education was “required for type of work.” The question is somewhat ambiguous in this sense, not distinguishing for the respondent if the question pertains to schooling for entry to the occupation or to schooling to actually perform the job. For this reason I have included three measures from the 2004 Work and Lifelong Learning (WALL) survey, as none exactly replicate the question from the 1983 Canadian Class Structure survey. The measures from 2004 include: schooling for “entry” to the respondent’s job (credential), schooling actually necessary to perform the respondent’s job (performance), and whether the respondent feels they are underqualified, overqualified, or appropriately skilled for their work (subjective). The three measures from 2004 are best examined comparatively in relation to the 1983 measure of education-job matching.
findings for specialists where the data suggest that both credential and performance requirements have dropped since 1983.
<table>
<thead>
<tr>
<th></th>
<th>1983</th>
<th></th>
<th></th>
<th>2004*</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post-Sec** Attained</td>
<td>Post-Sec Required for Type of Work</td>
<td>Underemployed</td>
<td>Post-Sec Attained</td>
<td>Post-Sec Required for Entry to Job</td>
<td>Credential Underemployment</td>
<td>Post-Sec Required to Perform Job</td>
<td>Performance Underemployment</td>
</tr>
<tr>
<td>Managers</td>
<td>%</td>
<td>41</td>
<td>75</td>
<td>15</td>
<td>72</td>
<td>67</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>Supervisors</td>
<td>%</td>
<td>23</td>
<td>39</td>
<td>21</td>
<td>56</td>
<td>31</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>Specialists</td>
<td>%</td>
<td>85</td>
<td>87</td>
<td>17</td>
<td>83</td>
<td>81</td>
<td>20</td>
<td>79</td>
</tr>
<tr>
<td>Service employees</td>
<td>%</td>
<td>16</td>
<td>16</td>
<td>25</td>
<td>50</td>
<td>35</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>%</td>
<td>12</td>
<td>10</td>
<td>33</td>
<td>34</td>
<td>20</td>
<td>33</td>
<td>18</td>
</tr>
<tr>
<td>Total employees</td>
<td>%</td>
<td>25</td>
<td>28</td>
<td>25</td>
<td>56</td>
<td>45</td>
<td>31</td>
<td>45</td>
</tr>
<tr>
<td>TOTAL</td>
<td>N</td>
<td>1,482</td>
<td>1,462</td>
<td>1,462</td>
<td>4,217</td>
<td>3,877</td>
<td>3,844</td>
<td>4,038</td>
</tr>
</tbody>
</table>

**Sources:** 1983 Canadian Class Structure Survey; 2004 Work and Lifelong Learning Survey.

*Note: The questions from 1983 and 2004 on educational requirements for work were different in wording. The 1983 question (Q65) was more vague, asking about "schooling required for type of work" and not differentiating between, as the WALL survey does, education for entry (credential) and education to actually perform one's job (performance).

**Note:** "Post-Sec" stands for "Post-Secondary"

***Note:** This measure from the WALL survey (s19_6) asked respondents: "In terms of your schooling, do you feel you are: 1) very overqualified; 2) somewhat overqualified; 3) adequately qualified; 4) somewhat underqualified; or 5) very underqualified for your current job."
As noted in relation to educational attainment, above, this may be the result of sample size and/or the increase in technical and semi-professional specialists positions that require less schooling than classic professionals. While I am cautious about drawing too strong a conclusion about the direction of change, the findings on underemployment—specifically the similarity of the three underemployment measures from 2004—create somewhat more certainty. This seeming increase in underemployment among specialists and managers is a topic I return to throughout the rest of my analysis, where I use more disaggregated occupational data from 2004, a range of other variables, and interview material to unpack if this underemployment is occurring, how it is related to the organization and technology of various specialists’ work, and if we should expect it to worsen in the near future.

For now, the point I want to emphasize is that, generally, workers in non-specialist, non-managerial occupations report a general upgrading and that specialist and managerial work continues to demand a high level of schooling, despite the small downward shift between 1983 and 2004.119 A number of other

119 Underemployment (education required v. education attained) by education level suggests that those with more education are more likely to be underemployed, and underemployment has increased over time. Those with no high school (HS) diploma weren’t and aren’t underemployed; around a third of those with only a HS diploma were underemployed in both 1983 and 2004; around 45 percent of those with a college certificate (CC) were underemployed in both 1983 and 2004; around 25 percent of those with a university degree (BD) were underemployed in 1983 rising to above 40 percent in 2004; and around 45 percent of those with and professional/graduate degree were underemployed in 1983, rising to over half in 2004 (1983, N=1,734; 2004, N=5,100). Underemployment by age indicates younger workers are, expectedly, more likely to be underemployed than older workers. While underemployment increased for all ages, it increased slightly more for older workers. Underemployment for those 18-24 years old increased from around a third to almost half; those 25-34 hovered around a third. Underemployment for those 35-44 increased from around 15 percent to over a third; underemployment for those 45-54 increased from around 15 percent to just under a third; and underemployment for those 55-64 increased from around 15 percent to just over a third (1983, N=1,708; 2004, N=5,018).
measures are comparable between the 1983 and 2004 surveys that add depth to
our understanding of how the skill (as-complexity) levels of work are changing
overall, for broad occupational groups, and for specific occupations.

**Initial Job Training**

Beyond formal schooling, respondents were asked about the training time
necessary to gain the knowledge to be competent to perform one’s job in both the
1983 CCS survey and 2004 WALL surveys. This measure, often referred to as
specific vocational preparation (SVP), provides another important tool for more
directly examining the complexity of work. In a fairly straightforward way, one
would expect that work that is more routinized and less challenging will take less
time to learn.

The data in Table 6.2 below presents some interesting findings that both
contradict and support the upgrading thesis, including the more specific claims
around the knowledge class. The most obvious trend is that, if focus is on the “few
days” and “week to a month” categories, initial training has been increasing for non-
managerial/non-supervisory employees, particularly for service and industrial
workers. In 1983 a little over a tenth of service workers and a little over one-fifth of
industrial workers reported their job took more than a year to learn while in 2004 a
quarter of service workers and over 40 percent of industrial workers reported a
year or more of training was necessary. The percentage of specialists reporting their
training took longer than one year increased from 30 percent to just under half. In
this sense the upgrading thesis is supported in a very general way. There are two
trends, however, that challenge a-rising-tide-will-lift-all-boats theory of upgrading.
First, for 2004 continues to be a polarization of training requirements within each occupational group, and the pattern remains little changed from 1983. This is the same trend—simultaneous upgrading and bifurcation—that Myles found in his 1988 study, described earlier, using data that stretches the analysis back into the 1960s. If anything, this polarization has actually worsened between 1983 and 2004, with clustering of, say, service workers in short-training and long-training jobs but not many in mid-training (e.g., three to six months, or six months to a year). Yes, some new and existing jobs have become more complex, but many remain simple with training requirements of less than a month (around 30 percent overall) in 2004.
<table>
<thead>
<tr>
<th></th>
<th>1983</th>
<th>2004</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Few days</td>
<td>Week to a month</td>
<td>1-3*</td>
<td>3-6</td>
</tr>
<tr>
<td>Managers</td>
<td>% 6 4 21 4 11</td>
<td>% 4 9 11 9 8</td>
<td>% 4 9 11 8 24</td>
<td>% 4 9 11 8 24</td>
</tr>
<tr>
<td>Supervisors</td>
<td>% 12 10 15 7 13</td>
<td>% 7 16 13 8 6</td>
<td>% 7 16 13 8 6</td>
<td>% 7 16 13 8 6</td>
</tr>
<tr>
<td>Specialists</td>
<td>% 22 10 14 8 16</td>
<td>% 12 11 13 9 9</td>
<td>% 12 11 13 9 9</td>
<td>% 12 11 13 9 9</td>
</tr>
<tr>
<td>Service employees</td>
<td>% 33 20 17 9 9</td>
<td>% 20 18 19 9 8</td>
<td>% 20 18 19 9 8</td>
<td>% 20 18 19 9 8</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>% 27 21 15 8 6</td>
<td>% 15 18 15 5 6</td>
<td>% 15 18 15 5 6</td>
<td>% 15 18 15 5 6</td>
</tr>
<tr>
<td>Total employees</td>
<td>% 28 18 16 8 9</td>
<td>% 14 15 15 8 7</td>
<td>% 14 15 15 8 7</td>
<td>% 14 15 15 8 7</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,462); 2004 Work and Lifelong Learning Survey (N=3,506).

* All columns are by month except where indicated.
This leads into the second problem with scenarios of upgrading that fixate on directionality; over forty percent of all employees are still working in jobs that take three months or less to learn. Among specialists, where complexity of work is often assumed, over a third report that their job takes less than three months to learn. Interpreting the overall findings from the training time measure is somewhat difficult. On the one hand, participation in a targeted pre-job-entry educational program (e.g., trades apprenticeship, database management, hairstyling, etc.) could reduce necessary training time ("false negatives"). On the other hand, a complex bureaucratic structure where rules of hierarchy and conduct lead to detailed, convoluted procedures and reporting structures could conceivably increase training time even where the actual job is not particularly challenging ("false positives"). This latter phenomenon is more likely among managers, supervisors, service workers and specialists, with more (approximately 40 percent) working within public, bureaucratic organizations. Disaggregation of specialists and specialist managers suggests that specialist occupations demanding intensive pre-entry programs and not much organizational specific knowledge (e.g., teachers and nurses) feel competent much sooner than other specialists where specific knowledge is more necessary (e.g., specialist managers, accountants and business analysts).

I will return to this issue shortly, using the data below on cognitive demands to offer further insight into the false positives/false negatives problem.
Cognitive Demands

Participants in the 1983 and 2004 surveys were asked about the “thought and attention” their job demanded. In Figure 6.2 below there is a very discernible pattern of increasing cognitive demands among service and industrial employees, a smaller increase among managers, and no perceptible decrease among specialists and managers. The minimal increase among managers and specialists is not surprising, really, considering their already high levels in 1983. The massive increase among service and industrial employees appears to directly refute claims of a trend toward simplification and routinization. It is worth reiterating, however, that it is possible the 2004 findings are inflated by somewhat less specific wording in the question. Where the 1983 CCS survey asked respondents if their job demanded: little thought, simple thought, simple problem solving, difficult problem solving or complex problem solving, the 2004 WALL survey worded the possible responses: none at all, a little, a moderate amount, or a great deal. Certainly, the 2004 wording speaks to complexity and a lack of routinization; routine by definition reduces thoughtfulness and problem solving. However, there is the possibility that someone who works in a fast-paced but low-complexity environment on a production line or serving customers might report their job demands “a great deal” of thought and attention, conflating intensification with complexity. Even if there are some “false positives,” it seems reasonable to conclude that there is little evidence of a trend towards monotonous, highly routinized work among any of the employee groups.
Examining “thought and attention” by SVP (training time) provides further evidence against the degradation-of-work thesis, and allows a closer examination of the seemingly high percentage of specialists who report short initial preparation for their jobs. Table 6.3 below suggests that the short training time of many specialists may in fact be, as noted above, misleading. The data indicates that demand for specialists’ “thought and attention” is high for jobs demanding a range of initial training, even if we aggregate in order to avoid charges of false precision.

Alternatively, the correlation coefficient of “initial training time” and “thought and
attention” for specialists in 2004 is 0.17 (Spearman correlation significant at the 0.01 level).
Table 6.3. Initial Training Necessary to Become Competent to Perform Job (Specific Vocational Training) by Thought and Attention Demanded by Job, Specialist Employees, 2004

<table>
<thead>
<tr>
<th>Thought and Attention</th>
<th>Few days or less</th>
<th>Week to a month</th>
<th>1-3 months</th>
<th>3-6 months</th>
<th>6-12 months</th>
<th>1-3 years</th>
<th>More than 3 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little thought and attention</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Moderate thought and attention</td>
<td>10</td>
<td>55</td>
<td>29</td>
<td>14</td>
<td>36</td>
<td>18</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Great deal of thought and attention</td>
<td>88</td>
<td>42</td>
<td>69</td>
<td>83</td>
<td>63</td>
<td>81</td>
<td>86</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Sources: 2004 Work and Lifelong Learning Survey (N=681).
Demand for New Skills

Figure 6.3 below shows the proportion of employed Canadians in 2004 that report their job demands learning new skills. The great majority of managers, supervisors and specialists report their job demands new skills, while service and industrial workers exhibit the same pattern if to a lesser degree. This measure should probably be viewed as an indicator of job “change” more than job “complexity.”

Figure 6.3. Job Demands Learning New Skills, Employed Canadians, 2004

<table>
<thead>
<tr>
<th>Category</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>84</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Supervisors</td>
<td>84</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Specialists</td>
<td>87</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Service employees</td>
<td>69</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>69</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>Total employees</td>
<td>76</td>
<td>19</td>
<td>5</td>
</tr>
</tbody>
</table>


As described in Chapter Three, the pressure for organizational reinvention identified early in capitalism’s development by Marx (1983) and described later by
Schumpeter (1975) as “creative destruction” has been intensifying as markets globalize, particularly with the introduction of highly malleable information technology in office work and information-intensive manufacturing technology. Such technological change has expected (and predicted) implications on the demand for workers at all levels to learn new techniques. In light of this, it is not surprising that only around a tenth of specialists report they are not required to learn new skills. Yet we must remain cautious about this measure, too, for the necessity for new skills is compatible with routine work: think of assembly line workers learning how to interact with new robotic technology in highly routinized manufacturing plants. As well, bureaucratic organizations frequently restructure in seeking more efficiency and profit. In managerial parlance this is often referred to as the development of internal “synergies” and the breaking down of “silos” (e.g., Connell & Voola, 2007), and increasingly involves restructuring based on external partnerships and networks (see Castells, 2000). The pressure for reorganization has been increasing as long-term planning and traditional employment relationships are disrupted by the short-term profit imperatives of publicly traded firms facing the quarterly scrutiny of speculative finance (P Thompson, 2003). This sort of “re-org” involves new procedures and reporting protocols, and the learning of new technical and soft skills (Frenkel, et al., 1999). Change, then, is not the same as increasing or decreasing complexity, and the requirement for new skills needs to be contextualized by other measures and more fine-grained analysis of structural differences in occupation (e.g., front-line or backroom, level of closure around a
trade or profession). Figure 6.4, below, suggests that much of the job change reported above is just that, change, and *not an increase* in complexity.

**Change in Job Complexity**

Figure 6.4 summarizes the results of a question that asked respondents in the 2004 WALL survey the extent to which the “skill” level of their job increased, stayed the same, or decreased over the previous five years. While the measure admittedly does not differentiate between skill-as-complexity and skill-as-autonomy/control, the question is preceded by a series of questions that ask specifically about issues of autonomy and control, and then the question above regarding the demand to learn new “skills.” While it cannot be said with absolute certainty, this structure and language of questions suggests that respondents would perceive the question as relating more to complexity than to autonomy. In any event, the measure strongly suggests that many workers perceive an upgrading trend, though not near as many as are experiencing change.
As with most of the direct measures above, however, the good news that few have experienced a decrease in complexity needs to be tempered by the finding that over 40 percent of all employees report no increase in the skill required for their job. Among service and industrial workers this lack of change is present for nearly half, suggesting that the dynamism of the economy is having a mixed impact on these non-managerial/non-specialist employees, many of who remain in low complexity jobs (two-thirds report they don’t need post-secondary education to perform their work). The third of specialists who report no change is less worrisome, considering the already high complexity requirements of their work. Reports of no change in skill requirements should not necessarily be viewed as a negative. It may reflect an already high possession and application of expertise;
alternatively, it may be that workers often take for granted the learning they do to cope with ongoing change (Livingstone & Sawchuk, 2004).

**Skill and Technology**

The role of technology, as described in the chapters reviewing relevant literature, has played and continues to play a central role in both optimistic theories of a postindustrial/post-Fordist work and pessimistic theories that predict work degradation through technology enhanced routinization and surveillance. The findings from the WALL survey, in Table 6.4, suggest that new technologies, at least in the early part of the new millennium, have in fact been decidedly “skill-biased.” Across all occupational groupings change in equipment and work technique is positively associated with increasing skill requirements (as differentiated from just skill change). Surprisingly, the association is stronger for service and industrial workers than other groups, in direct contrast to Marx, Braverman, and a host of critical theorists of technology and work.
Table 6.4. Interaction of “Skill Increase Over the Past Five Years” and “Extent to Which Equipment and Techniques Changed Over the Past Five Years,” Canadian Employees, 2004

<table>
<thead>
<tr>
<th>Employee Group</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>.239**</td>
</tr>
<tr>
<td>Supervisors</td>
<td>.254**</td>
</tr>
<tr>
<td>Specialists</td>
<td>.213**</td>
</tr>
<tr>
<td>Service employees</td>
<td>.357**</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>.307**</td>
</tr>
<tr>
<td>Total employees</td>
<td>.319**</td>
</tr>
</tbody>
</table>

** Based on Spearman correlation coefficient, significant at the 0.01 level.

The correlation of course doesn’t indicate causality, but the finding certainly does not support fears that digital technology has empowered employers in their quest for routinization and low-skill occupations. I emphasize “has” because, while information technology (IT) is nearly ubiquitous in industrial- and service-sector workplaces and workflows, the technology is still very much in its infancy and, as I discuss in the next chapter, the ability of digital technology to perform complex tasks is increasing rapidly.

Before examining the effect of IT on job complexity by specific specialist occupations, I first want to present broader findings on the autonomy and organizational “voice” of employee groups. Certainly, the findings presented so far indicate that the content of work does not appear to be decreasing in complexity for many workers, and that across the occupational spectrum many workers perceive that complexity requirements have increased. While complexity has increased most
among those who began most disadvantaged—service and industrial workers—it also appears to be increasing for supervisors, managers, and a great number of specialized workers. The findings so far support knowledge-based economy (KBE) and other new paradigm theorizing that offer optimistic claims over the changing nature of work. As described earlier, however, and argued in my Methodology, the complexity of work must be analytically distinguished from issues of task-level control, even if the two have historically been strongly correlated. Additionally, and also argued above, both complexity and task control must be located within an evaluation of influence over the broader organizational decisions if we are to build a more robust understanding of shifting relations of production, the social and technical division of labour, occupational closure, and class formation.

**How Much Control Do Workers Have Over their Jobs?**

In Figure 6.5 we see a significant rise in opportunities for job-level work-design among service and industrial workers in Canada, but a marked drop among specialists and managers from around 80 percent in 1983 to around 70 percent in 2004, with supervisors discretion falling almost as much.
These findings on the surface directly contradict the various claims made about “knowledge workers” and managers, where employers are forced to delegate more and more responsibility and/or autonomy to managers and specialists because of increasing speed, complexity, and uncertainty in markets, services, and product development. Despite the direction of change, the difference between managers, supervisors and specialists, on the one hand, and non-specialists, on the other, is still sufficiently large enough that the data here can’t disqualify the “knowledge class” or “creative class” theses (though the directionality of the trend certainly gives pause). The data suggests that planning and design in the workplace (i.e., conception) may be a zero-sum phenomenon, where increasing discretion among
non-specialist, non-managerial employees is coming at the expense of managers, supervisors, and specialists. This finding also appears to contradict one part of Braverman’s thesis: clearly, polarization is not supported yet the downward trend for specialists fits partly with Braverman’s thesis on what might be termed the “proletarianization” of many specialists. At this level of aggregation, Adler’s “socialization” thesis—rising complexity and involvement for mass workers and declining autonomy for specialized labour as they are integrated into productivity enhancing, interdependent labour processes—is also suggested. The problem with drawing conclusions at this point, and at this level of aggregation, is that the drop in discretion for specialists and managers may be the result of compositional changes and not changes in labour processes. For example, it could be that more women, who historically enjoy less discretionary control, have entered specialist and managerial occupations. The same could apply to racialized people or younger workers. Or occupational growth might have occurred more quickly in new and existing semi-professional occupations, where discretionary control is lower, than in classic professional occupations.

**Potential factors in declining discretion for specialists and managers.**

One potential explanation for the decrease in discretionary opportunities among managers, supervisors and specialists is the shifting sex-composition of managerial and specialized labour. Data from the CCS and WALL surveys (see Appendix G) suggest that women’s growth in employment since the 1980s has been mainly in specialist and managerial positions (see Tables G1 and G2). Certainly, women in the workforce generally enjoy less opportunity for discretionary activities
but among specialist occupations this does not appear to be the case. In fact, the data (see Table G3) suggest that, within the technical, semi-professional and professional occupations that make up the “specialist” category, women find the greatest equality with men. Among specialists it has been men who have seen their discretionary activity erode far more than women. Among managers, women have lost more discretionary opportunities than men, but the difference is not as substantial and not, to my reading, suggestive of sex-related effects. At a general level, then, sex-composition appears as an unlikely cause of declining “responsible autonomy” among specialists and managers.120

There is also little doubt that race and ethnicity have been structural factors shaping the distribution of power both outside and within the workplace. Engineers and systems analysts had a much higher proportion of “non-white” individuals (one-fifth and one-quarter respectively) than other specialist occupations.121 WALL data suggests that, among employed Canadians, Whites (just under two-thirds report designing work all or most of the time) continue to enjoy more discretion than Visible Minorities (only half report designing their work all or most of the time). Table G4 breaks out data on discretionary opportunities by occupational group, and

120 Basic sales and service occupations (“service employees”) and extraction and manufacturing occupations (“industrial employees”) continue, however, to be segregated by sex. Overall, male workers with a female manager did grow from nearly zero in the early 1980s to about a fifth in 2004. The biggest change came for female employees, around three-quarters of whom had a male manager in 1983 but by 2004 there was much more balance with women workers reporting to a man around 60 percent of the time and to a woman around 40 percent of the time.

121 Unfortunately, a comparison of discretion in 1983 and 2004 based on self-identified race is not possible. The 2004 WALL Survey does afford a comparison by visible minority status, but due to sample size a dichotomous aggregate of White and Visible Minority is used.
indicates that racial inequality persists throughout the occupational spectrum in a fairly regular though not drastic way. At less than one-sixth of the specialist workforce and less than one-tenth of managers it is unlikely any race-based compositional change is unlikely to have caused the broad decline evident in Figure 6.5.

Another potential factor impacting discretion is different autonomy within different age cohorts, particularly if the workforce is undergoing compositional changes with, say, an influx of youth. Younger workers have traditionally enjoyed less discretionary opportunities due to a variety of factors. These include job-specific inexperience, entry into the lower echelon of bureaucratic hierarchy, and an increased likelihood to be in service jobs that, as we saw above, offer less discretion overall, and specifically in low-pay, low-autonomy customer-service jobs (Loughlin & Barling, 2001; J. McMullin, 2004). As well, and as a consequence, younger workers tend to experience greater levels of underutilization of their formal schooling (Livingstone & Scholtz, 2006). It is possible that an influx of younger workers into a broad occupational group would decrease overall levels of discretion without any fundamental relationships of power having changed. Canadian census data shows, however, the median age of the workforce is increasing (J. A. McMullin, Cooke, & Downie, 2006) and one would then expect autonomy-control to be rising overall. Specific to the broad occupational groups used in this chapter so far, Table G5\textsuperscript{122}

\textsuperscript{122} Note that a dichotomous aggregation of ages, 18-34 and 35-64, is used in order to allow comparison between the smaller 1983 survey and the 2004 survey.
strongly suggests there has been a drop in younger workers among all occupational groups except supervisors. Data in Table G6 on changing discretionary activity by age within occupational groupings indicates that younger and older workers experience similar levels of discretion in each occupational group, and that decreases in opportunities for job design were fairly close, except for supervisors. Overall, then, like sex and race, there is little support that age is a factor in the general drop in discretionary activity among the managers and specialists who are at the heart of knowledge class theorizing. Another explanation of the drop is that we are witnessing less homogeneity within broad occupational groups.

**Job Design and Occupational Composition**

To account for the relatively large decrease in discretionary opportunities among managers and specialists, during a time when those in subordinate/less specialized service and industrial jobs experienced a dramatic upswing, I argued earlier it is necessary to begin looking at various white-collar occupations in a more fine-grained way. I do this here in two ways. First, I break the specialist group into classic “professionals” and “semi-professionals” as described in Chapter Five. I examine compositional changes and then change-in-discretion between 1983 and 2004. Second, I break the entire specialist category into specific occupational groups

---

123 Further disaggregation using only WALL survey data shows that the youngest workers (18-24) are not substantially different from other younger workers (those 25-34) except within the manager and specialist categories. Among managers, 18-24 year-olds design their own work “all or most of the time” only 52 percent of the time compared to 66 percent of the time for 25-34 year-olds. Among specialists, 18-24 year-olds design their own work “all or most of the time” only 58 percent of the time compared to 70 percent of the time for 25-34 year-olds. 18-24 year-olds are, however, a small percentage of young workers (18-34) among both managers and specialists; just 14% of young managers and 26% of young specialists.
(e.g., engineer, teacher, IT worker). As noted in Chapter Five, due to low participant numbers disaggregation for some occupations is not possible (e.g., doctors, lawyers, chiropractors, geologists).

Both classic professional and semi-professional occupations have grown, but the latter have grown slightly faster. As a proportion of the total workforce, classic professionals rose from five percent to seven percent while semi-professionals rose from four percent to 10 percent (Hansen, 2001). This means that, if we look at just the specialist category as a whole, semi-professionals now account for around 60 percent of occupations whereas in 1983 they were just half. Yet the increasing proportion of semi-professionals doesn’t seem to be the cause of declining discretion within the specialist category. Among classic professionals, in 1983 some 85 percent claimed they designed their work. In 2004, only around 70 percent claimed to design their work. This drop is bigger than the drop experienced by those in semi-professional occupations, with almost three-quarters claiming to design their work all or most of the time in 1983 and around two-thirds in 2004. For specialists, then, composition does not seem to explain the overall decline in “autonomy-control.” The somewhat disaggregated finding supports the more general trend. The overall finding that discretion dropped greatest among the most
privileged further calls into question celebratory theories of a new, powerful knowledge class.¹²⁴

Further disaggregation reveals important differences among specialist occupations. Table 6.5, which disaggregates the managerial and specialist occupational groups as much as the 2004 data will allow,¹²⁵ shows that specialist managers are nearly identical to the managerial group as a whole in opportunities for discretion (just over two-thirds). Among specialists there is important heterogeneity but, overall, specialists are still more like each other than they are like non-specialist, non-managerial employees. Among specialists, teachers clearly enjoy the greatest opportunity to design their work while nurses experience the least (a caveat here is that there may be specialist occupations with lower discretionary opportunity than nurses that are folded into “Other Specialists” because of a small N). Despite both being highly feminized occupations (though this is changing), the nature of these two public-sector professions is quite different. While teachers are certainly constrained in their dealings with administration, and by curriculums of increasing specificity (Schweisfurth, 2006), once in the classroom they are expected to design and lead lessons, deal directly with parents, and perform a host of other fairly autonomous activities (Livingstone & Antonelli, 2010). Nurses, by contrast, are expected to follow strict routines and carry out doctors’ orders to a frequently

¹²⁴ Attempts to examine issues of composition for managers were hindered by small participant numbers in 1983. The findings, while only suggestive, suggest that mid-level managerial occupations grew fastest but that declines in discretion for that group were smallest.

¹²⁵ Unfortunately, the sample size from the 1983 Canadian Class Structure Survey doesn’t provide a large enough number of participants for an examination of compositional effects at the level of specific specialist occupations, or between managers in specialized fields and other managers.
high-degree of specification.\textsuperscript{126} This is potentially changing; for example, in Ontario Bill 179 has been introduced. It will grant additional, though still limited, authority to nurse practitioners (Ontario College of Nurses, 2010). For other professional and professionalizing groups identified in Table 6.5, the results are both surprising and expected. Those in the arts and media report designing their own work to a high degree. It does not seem a stretch that much production of art or media involves relatively high levels of conceptualizing and problem solving, with a greater emphasis on deadlines and outcomes rather than fine-grained managing of the creative process. Arts and culture workers may, however, be experiencing rising managerial scrutiny and routinization (Huws, 2006; Neilson & Rossiter, 2005). For those whose work tends to be more technical and who are at the centre of business process design and modification—accountants, business analysts, engineers and IT workers—there exist levels of responsible autonomy that are roughly similar. Engineers and IT workers are nearly identical with almost two-thirds reporting they design their own or others’ work all or most of the time.

\textsuperscript{126} The emphasis on “complexity” has, of course, a technical bias that marginalizes the emotional labour performed by nurses in their care for patients. But, while this emotional labour is (in)valuable, it occurs within highly prescribed and routine care processes (Henderson, 2001).
Table 6.5. Opportunity to Design Work, Specialized Canadian Employees, 2004

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Never</th>
<th>Sometimes</th>
<th>All or Most of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>%</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Arts &amp; Culture</td>
<td>%</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Managers in Specialist Fields</td>
<td>%</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>Other professionals / specialists</td>
<td>%</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>Accountants &amp; Business Specialists</td>
<td>%</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>Engineers</td>
<td>%</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>IT Workers</td>
<td>%</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>Technologists &amp; Professional Support</td>
<td>%</td>
<td>3</td>
<td>39</td>
</tr>
<tr>
<td>Nurses</td>
<td>%</td>
<td>5</td>
<td>44</td>
</tr>
</tbody>
</table>

Sources: 2004 Work and Lifelong Learning Survey (N=1,701).

Issues of compositional change over time are relevant here, even if comparison of discretionary change within occupations is not possible because of small numbers of participants in individual occupations in the 1983 study. If growth in certain lower-discretion occupations (e.g., nurses) were faster than higher-discretion occupations (e.g., teachers) then the decrease in discretion could be compositional and not reflective of changes in the labour process as such. This,
however, does not appear to be the case. Using the best available data, we know that
the number of nurses in Canada, who have traditionally had relatively less
autonomy-control, grew at a rate of less than one percent per year between 1986
and 2001 (Canadian Institute for Health Information, 2010). The number of public
school teachers also grew at a rate of less than one percent per year between 1988
and 2001 (Nault, 2004; Statistics Canada & Council of Ministers of Education
Canada, 2000). These growth rates meant that nurses grew slightly from around
200,000 in number in 1986 and to 227,000 in 2001, and teachers also grew slightly
from 282,000 in 1988 to 310,000 in 2001. With such slow growth and relatively
stable labour processes, and as the two largest specialist occupational groups, these
two autonomy-control extremes likely cancel each other out, so to speak, as
potential causes of the decline in discretion between 1983 and 2004.

Other specialist occupations grew faster than nurses and teachers.
Engineering grew at an average rate of 4.3 percent per year between 1987 and 2002
(Danyluk, 2003), including a drop to -1.9 percent per year between 1991 and 1996
(Lavoie & Roy, 2003). The number of IT workers grew the most rapidly of all
specialist occupations, at 8.4 percent between 1986 and 1991 and then slowing to
the growth rate increased dramatically to 15 percent per year (Duerden Comeau,
2003). Between 1986 and 2001 the average annual growth rate was approximately
12 percent per year, reflecting the enormous adoption of computers and other
digital tools by Canadians in nearly every sphere of activity.\textsuperscript{127}

For specialists overall there exists little evidence that skill (as-complexity)
requirements are related to involvement in job design (Table 6.6 below). The
finding of no relationship suggests increases in complexity described earlier in this
chapter\textsuperscript{128} occurred among those with high levels of discretion as well as among
those with low levels.

\textit{Table 6.6. Correlation of Skill Increase Over the Past Five Years and Opportunity to
Design Work, Canadian Employees, 2004}

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>.085 *</td>
</tr>
<tr>
<td>Supervisors</td>
<td>-.039</td>
</tr>
<tr>
<td>Specialists</td>
<td>-.013</td>
</tr>
<tr>
<td>Service employees</td>
<td>.154 **</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>.216 **</td>
</tr>
<tr>
<td>Total employees</td>
<td>.155 **</td>
</tr>
</tbody>
</table>


* Based on Spearman correlation coefficient, significant at the 0.05 level.
** Based on Spearman correlation coefficient, significant at the 0.01 level.

\textsuperscript{127} While not directly relevant to the question of declining discretion for specialists, it is worth noting that a
study of Canadian “knowledge workers” (Baldwin & Beckstead, 2003) finds that growth of “technical
occupations”\textsuperscript{127} between 1971 and 2001 was imperceptible, moving from just under four percent to just
over four percent. This includes a growth to around five percent in 1991 and then a decline.

\textsuperscript{128} Figure 6.4 showed that over 60 percent of specialists reported increased skill requirements in the past
five years, just over a third reported no change, and barely any (two percent) reported a drop.
Put another way, almost no specialists report a decline in the complexity of their jobs, and nearly two-thirds report an increase, yet task discretion is declining overall for this group. A similar pattern is visible for managers and, to a lesser extent, supervisors. Only service workers and industrial workers are experiencing increasing discretionary opportunities and rising complexity, though their relatively low starting point and the introduction of technology into workplaces goes some distance in explaining their faster increase. Despite the rising knowledge requirements and opportunities for discretionary activity among service and industrial workers, these two groups are still substantially different than managers, specialists, and supervisors, though the latter is rarely included within variations of the new class. For managers, supervisors, and specialists, the data on formal educational attainment, use of formal education, complexity, training, and even discretion are all quite similar and support at least the idea of difference from the general working class.

Among specialists, formal education to perform one’s job is only moderately correlated with opportunities for discretionary activity in one’s job (.17, based on Spearman’s correlation coefficient significant at the 0.01 level). The training time necessary to become competent in one’s job (SVP) is only very weakly correlated with discretionary activity (.1, based on Spearman’s correlation coefficient significant at the 0.05 level). For managers, the correlation between discretion and formal education required to perform job is .12 (based on Spearman’s correlation coefficient significant at the 0.01 level). The correlation between discretion and SVP
for managers is stronger than for specialists, but still relatively weak at .18 (based on Spearman’s correlation coefficient significant at the 0.01 level).

These findings suggest the assumption of a direct and positive correlation between job complexity and discretionary opportunities—an assumption that underpins much of the (occupationally based, macro-level) knowledge class theorizing—needs much further investigation. In fact, the survey findings show discretion and complexity are going in opposite directions for the specialists and many managers deemed “knowledge workers.”

Discretion, correlated with rising complexity, appears to be less related to technological change in the labour process, even as there is little argument that technology is becoming more sophisticated at an accelerated rate and very likely part of the general upgrading in job complexity. As the evidence in Chapter Three made clear, Canada’s economy is most certainly knowledge-based with massive amounts of research and development going on in the private sector, universities increasingly oriented to commercialization of innovations and knowledge mobilization, and the labour force shifting (slowly but steadily) towards jobs requiring advanced bodies of knowledge, strong writing and communication skills, and new knowledge-intensive industries. Contrary to the deterministic arguments that claim new technology is biased toward more complex jobs and more job-design input by the knowledge class, the data so far only seems to support the first claim. Job design instead appears to be much more influenced by other factors. This leads us to another test of knowledge class and post-bureaucracy theses: participation (or “voice”) in organizational decision-making.
Involvement in Organizational Decision-Making

This survey questions asked respondents about their involvement in operational and strategic policy-making in their main workplace as it relates to products or services delivered, budget setting, the total number of people employed, and other issues. What we see in Figure 6.6 is that, overall, employees are much more involved in 2004 than they were in 1983, with service and industrial employees enjoying the largest increases in participation while managers experienced no change. In contrast to the similarity of managers and specialists as it relates to discretion (around 85 percent of both managers and specialists design their work all or most of the time), evidence on strategic organizational decision-making suggests decidedly dissimilar experiences. Specialists clearly were in a very “middle” position in 1983, similar to supervisors but substantially less involved than managers and more involved than service and industrial workers. Twenty years later there appears relatively little change in the percentage of specialists who are entirely excluded from organizational decision-making, no change among managers, and supervisors have become similar to managers. It may be that expectations for participation have increased but it is also possible that those who are participating are doing so in more superficial ways (as Braverman claims). Both possibilities demand further investigation and, while I try to explore them in the interviews, each is difficult to get at using the data in this project. What the data does tell us is that the difference between specialists, on the one hand, and service and industrial workers, on the other, has decreased significantly, if potentially superficially.

Certainly a gap remains but the percentage of specialists excluded from decision-
making is now closer to these two latter groups than it is to managers or supervisors.

Figure 6.6. Employees Reporting No Involvement in Organizational Decision-Making, Canadian Employees, 1983-2004

Sources: 1983 Canadian Class Structure Survey (N=1,484); 2004 Work and Lifelong Learning Survey (N=4,124).

The data in Figure 6.6 should be read as good news, but with important caveats. It is obvious that many more workers are enjoying at least some voice in organizational decision-making. The caveat is that half of all employees remain entirely excluded from the organizational decision-making processes that directly affect their job and affect the broader labour processes to which they are linked.
This good news-bad news theme is apparent, too, when we examine involvement in decision-making by sex. From over 80 percent excluded in 1983, Figure G1 (see Appendix G) shows that women have been part of the trend toward involvement with almost a third now making decisions or making decisions as part of a group. Yet men have acquired participation at all decision-making levels at almost the same rate, and inequality in decision-making voice persists. Gains in decision-making participation roughly follow this pattern when viewed at the level of occupational group. Table G7 (see Appendix G) shows that, like most other variables viewed in this chapter, most of the change occurred for workers lower in the hierarchy, including supervisors, service employees and industrial employees. Little change occurred for men and women working in managerial roles, but among specialists it appears that women made gains in decision-making participation at almost double the rate of men. Among specialists, women have narrowed the gap but still around half remain excluded while around 40 percent of men are excluded. When decision-making is examined by visible minority status, in Figure 6.8, the same pattern of increasing participation for all but continued inequality is evident. As very few visible minorities were in managerial and specialist positions in 1983, comparison by those occupational groups is not possible. As well, the data below doesn’t reflect the ongoing exclusion of visible minorities from those positions (according to WALL 2004 data Visible Minorities hold only 15 percent of specialist positions and only 10 percent of managerial positions). In terms of age, Table G9 (see Appendix G) suggests that changes in involvement in organizational decision-making were fairly consistent regardless of how old one is.
Taken together, the data on decision-making as it relates to sex, age and race strongly suggest that, like decreases in discretionary opportunities, increasing levels of involvement among managers and specialists are not the result of groups subordinated based on race, sex or age gaining against traditionally dominant groups (white males). With acknowledged variation, increases have occurred for men and women, for Visible Minorities and Whites, and for younger and older workers at about the same rate. My readings of the data indicate that changes are more likely driven by restructuring in the labour process itself, and thus I return to examine more closely the occupational data introduced earlier.

Figure 6.7 provides a fuller picture of changes in decision-making by occupational group. Visible is evidence that managers have enjoyed a large expansion in decision-making power, with almost 30 percent now making decisions on their own and about the same number making decisions as part of a team. Almost a fifth of supervisors continue to be decision-makers, while many more now make decisions as part of a team or provide advice. Specialists have only experienced growth among those making decisions as part of a team, and almost half still have no voice in strategy. Service and industrial employees both enjoyed an expansion in all four levels of decision-making participation, though well over half of both groups continue to be excluded from decision-making processes.
There are two important findings suggested by the data. First, while service and industrial workers have made large gains and specialists more moderate gains, hierarchy is still clearly visible in the 2004 data. Delegated “line authority” appears to be alive and well, even if trends to “flattening” and “decentralization” are supported. Second, and in contrast to autonomy-control, involvement in organizational decision-making does not appear to be a zero-sum phenomenon. Every category of worker except managers indicates greater involvement. As alluded to briefly above, this
conclusion needs to be tempered, however, in that the nature of individualized survey data makes it impossible to know the sorts of decision processes that respondents are involved in (and not involved in). It is conceivable that many service and industrial workers are gaining decision-making power only within a very limited sphere of activity and/or within a context where a budget and deadlines have already been set and they are given individual or team-based autonomy to make specific, task-related decisions. Across the occupational groups in Figure 6.7, most of the growth in decision-making participation has occurred at the level of “advice only” and “as part of group.” Like decisions made “subject to approval,” employees can participate in these forms of decision-making without greatly disrupting line authority.

This is not an attempt to turn good news into bad, only to recognize that the delegation of authority for budgetary, staffing, and product/process improvement decisions was and is a major part of managerial strategies like Total Quality Management as well as organizational structures where “business units” operate as their own cost-centres within large, private, service-sector bureaucracies.¹²⁹ Likewise, staff authority is increasingly delegated in organizations seeking to motivate their employees and/or take advantage of all workers’ knowledge. The extent to which such efforts at involvement are just lip service, and relatively superficial, or are genuine efforts to take the opinions of non-managerial employees

¹²⁹ Such trends in organizational structure may be spreading into manufacturing and extractive firms, but evidence remains thin.
seriously cannot be known from the data above. The qualitative data in the next chapter allow a closer examination of some of these questions and themes, but before we close this chapter I want to disaggregate the data on discretion and decision-making in a range of other ways that help evaluate the more general data.

Decision-Making Involvement for Specialists

Further depth is added to the trends observed above when broad occupational groups variously associated with the knowledge class are examined separately (or as separately as the data will allow). Figure 6.8 indicates that specialists and specialist managers can be categorized into three broad groupings based on level of involvement in decision-making. Not surprisingly, based on continued evidence of hierarchy, managers in specialists fields are the least excluded and most likely to make decisions on their own (only a fifth are excluded); accountants and business specialists, engineers, teachers, arts and media workers, and other professionals/specialists are all roughly similar (around a third or just over are excluded); and nurses, IT workers and technologists and professional support workers are the least likely to report participation of any kind (half or more are excluded).
Figure 6.8. Level of Involvement in Organizational Decision-Making among Specialist Managers, Specialist Employees, and Technologists and Professional Support Employees, Canada, 2004

Nurses, as described earlier, face significant structural constraints on their job control and their participation in policy-making based on a fairly rigid division of labour organized around expertise (and historical patriarchal relations in the medical workplace). Teachers, who exhibited such a high degree of opportunity for discretionary activity, are middle-of-the-pack in participation in policy-making—the result perhaps of trends towards centralized policy setting and top-down accountability mechanisms (Bedard & Lawton, 2000; Jaafar & Anderson, 2007). The impact of initiatives like school-improvement plans and school-based management are more difficult to assess, as it delegates responsibility for budget allocation and staffing decision but is highly constrained by centrally set budget amounts. Decision-making in school-based management is a contested process subject to localized context and traditions are well documented (Anderson, 2004).

Almost two-thirds of accountants and business analysts are involved in decision-making in some way, around the same amount as those working in arts and cultural fields. A relatively large percentage of engineers either make decisions as part of teams (around a third) or make decisions themselves (around a tenth). Engineers and IT workers, who perform largely the same sort of work—applying knowledge in engineering more efficient processes and designing new commodities—contrast sharply in decision-making opportunities despite similar levels of discretion. In fact, technologists and professional support staff, who one would expect to be the least involved among those included in Figure 6.8, report they make decisions themselves far more frequently than do IT workers, and are about the same as IT workers when “make decisions by oneself” and “make
decisions as part of a group” are combined. Only nurses are more excluded than IT workers among specialized labour, and even here more nurses than IT workers report making decisions (either by themselves or as part of a team).

With regards to the relationship between discretion and decision-making involvement, Table 6.7 shows that the association while positive, as one would expect, is not overwhelmingly so.

Table 6.7. Correlation of Decision-Making and Opportunity to Design Work, Canadian Employees, 2004

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2004</td>
</tr>
<tr>
<td>Managers</td>
<td>.281 **</td>
</tr>
<tr>
<td>Supervisors</td>
<td>.350 **</td>
</tr>
<tr>
<td>Specialists</td>
<td>.274 **</td>
</tr>
<tr>
<td>Service employees</td>
<td>.365 **</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>.238 **</td>
</tr>
<tr>
<td>Total employees</td>
<td>.352 **</td>
</tr>
</tbody>
</table>


** Based on Spearman correlation coefficient, significant at the 0.01 level.

Table 6.8 examines the correlation of discretion and decision-making for specialist labour and more managers in specialist fields. Here we see that for a number of specialist occupations, including IT workers, there is no relationship between discretionary opportunities and decision-making.
Table 6.8. Correlation of Decision-Making Involvement and Opportunity to Design Work, Specialist Canadian Employees, 2004

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers in Specialist Fields</td>
<td>.337 **</td>
</tr>
<tr>
<td>Accountants &amp; Business Analysts</td>
<td>.122</td>
</tr>
<tr>
<td>Engineers</td>
<td>.387 **</td>
</tr>
<tr>
<td>Teachers</td>
<td>.067</td>
</tr>
<tr>
<td>Nurses</td>
<td>.222 *</td>
</tr>
<tr>
<td>Arts &amp; Culture</td>
<td>.329 **</td>
</tr>
<tr>
<td>IT Workers</td>
<td>.144</td>
</tr>
<tr>
<td>Other professionals / specialists</td>
<td>.291 **</td>
</tr>
<tr>
<td>Technologists &amp; Professional Support</td>
<td>.323 **</td>
</tr>
</tbody>
</table>

* Based on Spearman correlation coefficient, significant at the 0.05 level.
** Based on Spearman correlation coefficient, significant at the 0.01 level.

The data in Tables 6.7 and 6.8 suggest that discretion and organizational decision-making are usually correlated. Those instances where the two don’t correlate present an opportunity for additional insight into how organizations are changing. A relationship between discretion and organizational decision-making doesn’t seem to exist for teachers. As discussed earlier, teachers have high levels of discretion with regards to their work in the classroom. Formally, they are largely excluded from school and district decisions and opportunities to participate at those levels are at the discretion of principals and board staff (Livingstone & Antonelli, 2012). The working conditions of IT workers are less formally structured, with teachers'
discretion and authority usually dictated by legislation and/or collective bargaining contracts and heightened by their need to interact directly with a diverse group of students, colleagues, parents and administrators. The case of IT workers is particularly puzzling when contrasted with engineers. It is tempting to assume that engineers have achieved greater occupational closure and therefore have secured greater control over all aspects of their work. Certainly this must be part of it, as I explore in the next chapter, but if engineers are more professionalized than IT workers one would expect the former to enjoy advantages in both spheres—task-level discretion and organizational decisions. The evidence suggests, however, that IT workers have just as much task-level discretion as engineers. There is a range of potentially relevant factors to explain this, some of which I explore below and others that emerge more fully in the next chapter.

Sources of Variation

Based on the data available to me I examined three main sources of variation that could potentially explain the declining discretion for specialists and managers: 1) variation due to sector of employment (i.e., public v. private); 2) variation due to involvement in a workplace-specific or occupation-specific workers’ association (i.e., in a union, an association, or not affiliated); and 3) variation due to size of employing organization. Neither public/private nor worker-association bore much fruit. As I detail in Appendix H, most of the findings suggest little difference, for example, between specialists in private and public sectors and among specialists in unions, associations and non-affiliated. This doesn’t mean that occupational closure isn’t important, as I show in the next chapter, only that its importance doesn’t
appear to play out at the level of aggregated but ultimately individualized survey data. The issue of organizational size, in contrast, did provide some interesting and, I believe, important clues about the changing nature of managers’ and specialists’ work.

Size of organization emerges from the literature as an important factor in relations of control within the labour process. Larger organizations tend to exist in industries that are more established and where technology and managerial strategies have matured (see Brint, 2001). They tend to be more complex and bureaucratic, with well-established reporting structures, formal procedures, and defined roles. But what size of organization means for specialists and managers, and for explaining declining discretion and rising decision-making involvement, is unclear. Some like Choi et al. (2008) find that control actually increases for highly educated specialists and managers in large organizations, but declines for everyone else. But such trends vary by country (see Clement & Myles, 1994) and it is worth evaluating if Choi et al.’s Australian findings correspond with trends in Canada. The findings below suggest they do not.

In Canada, the number of private sector firms with over 500 employees has remained fairly stable at 0.2 percent between 1983 and 2001, with small companies (0-19 employees) steadily dominating at over 90 percent of all private firms (Schaper, Dana, Anderson, & Moroz, 2009). The number of employees in firms with 500 or more employees has, however, been falling steadily since 1983, from around half of employees in 1983 to less than 45 percent in 2003 (Leung, Meh, & Terajima,
2008). CCS and WALL survey data on changes in the size of organizations employing public sector employees suggests a similar pattern.

Table 6.9 looks at the distribution of broad occupational groups by size of organization, and how this is changing over time. Findings here are useful to help further contextualize the changes in discretion and decision-making observed below, in Tables 6.10 and 6.11. Overall, there has been very little change in distribution of occupations by size of organization. In 1983 just over 40 percent of Canadian employees worked in “small” organizations of less than 100 people, around a quarter worked in “medium” sized organization of between 100 and 999 employees, and just less than a third worked in “large” organizations with 1000 or more employees. In 2004, there was only a slightly lower percentage in small organizations, about the same percentage working in medium sized organizations, and about the same percentage working in large organizations.

The survey data indicate little change in the sizes of organizations worked in among managers, service employees and industrial employees. There are slightly more managers in large organizations, not surprisingly, and service and industrial workers did and continue to mainly work in small organizations. The largest shifts occurred among supervisors and specialists. An increasing proportion of supervisors are found in small organizations. Whereas in 1983 over half of specialists were employed in small organizations, employment of specialists has shifted dramatically to large organizations. The distribution among specialists is now more even, with only slight bifurcation; over a third of specialists work in large organizations, just over a third in small, and just over a quarter in medium.
Table 6.9. Occupations by Size of Organization, Canadian Employees, 2004

<table>
<thead>
<tr>
<th># of Employees</th>
<th>1983</th>
<th>2004</th>
<th>Change*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100 %</td>
<td>30</td>
<td>32</td>
<td>+2</td>
</tr>
<tr>
<td>Managers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>33</td>
<td>29</td>
<td>-4</td>
</tr>
<tr>
<td>1000+ %</td>
<td>38</td>
<td>39</td>
<td>-1</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>28</td>
<td>48</td>
<td>+20</td>
</tr>
<tr>
<td>Supervisors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>39</td>
<td>26</td>
<td>-13</td>
</tr>
<tr>
<td>1000+ %</td>
<td>34</td>
<td>26</td>
<td>-8</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>53</td>
<td>35</td>
<td>-18</td>
</tr>
<tr>
<td>Specialists</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>25</td>
<td>28</td>
<td>+3</td>
</tr>
<tr>
<td>1000+ %</td>
<td>23</td>
<td>37</td>
<td>+14</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>46</td>
<td>44</td>
<td>-2</td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>24</td>
<td>27</td>
<td>+3</td>
</tr>
<tr>
<td>1000+ %</td>
<td>30</td>
<td>29</td>
<td>-1</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>43</td>
<td>42</td>
<td>-1</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>26</td>
<td>29</td>
<td>+3</td>
</tr>
<tr>
<td>1000+ %</td>
<td>32</td>
<td>29</td>
<td>-3</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>44</td>
<td>40</td>
<td>-4</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>26</td>
<td>28</td>
<td>+2</td>
</tr>
<tr>
<td>1000+ %</td>
<td>30</td>
<td>32</td>
<td>+2</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,474); 2004 Work and Lifelong Learning Survey (N=3,821).

* Change may not equal zero due to rounding.
Table 6.10 shows that, in both 1983 and 2004, as the size of the organization one works for increases, the opportunities for discretionary control decrease, except for industrial employees where, in 2004, size of organization doesn’t seem to be relevant. But the overriding story here, as elsewhere, is the apparent massive expansion in opportunities for service and industrial sector to participate in applying their ideas and shaping the context of their labour. The pattern for managers, supervisors and specialists is decidedly similar as of 2004, though starting points and rates of change are quite different. Managers in large (1000+) and small organizations (<100) have lost the most discretion, supervisors in medium (100-999) and large organizations have lost the most, and specialists have lost discretion at a fairly similar pace in all three sizes of organizations, with those in large organizations still disadvantaged in their opportunity to design their work. The implication of this, in light of the data in Table 6.9 that shows a major shift with specialist occupations much more likely to be in large organizations, suggests that if specialist employment continues to shift to large organizations, where bureaucratic practices seemingly reduce autonomy-control, there will be a continued decrease in discretionary opportunities overall. The news for service and industrial workers regarding discretion is across-the-board positive, though it is unclear if there is a “discretion-ceiling” that will block future growth in opportunities to design work. I return in the discussion chapter to examine more fully structural and agential factors that may in fact create and maintain such a ceiling for the working class.
Table 6.10. Opportunity to Design Work All or Most of the Time by Occupational Group, Canadian Employees, 1983-2004

<table>
<thead>
<tr>
<th></th>
<th># of Employees</th>
<th>1983</th>
<th>2004</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Managers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>%</td>
<td>92</td>
<td>73</td>
<td>-15</td>
</tr>
<tr>
<td>100 to 999</td>
<td>%</td>
<td>83</td>
<td>74</td>
<td>-9</td>
</tr>
<tr>
<td>1000+</td>
<td>%</td>
<td>81</td>
<td>66</td>
<td>-15</td>
</tr>
<tr>
<td><strong>Supervisors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>%</td>
<td>77</td>
<td>77</td>
<td>0</td>
</tr>
<tr>
<td>100 to 999</td>
<td>%</td>
<td>88</td>
<td>73</td>
<td>-14</td>
</tr>
<tr>
<td>1000+</td>
<td>%</td>
<td>77</td>
<td>60</td>
<td>-17</td>
</tr>
<tr>
<td><strong>Specialists</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>%</td>
<td>85</td>
<td>74</td>
<td>-11</td>
</tr>
<tr>
<td>100 to 999</td>
<td>%</td>
<td>85</td>
<td>70</td>
<td>-15</td>
</tr>
<tr>
<td>1000+</td>
<td>%</td>
<td>77</td>
<td>64</td>
<td>-13</td>
</tr>
<tr>
<td><strong>Service employees</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>%</td>
<td>30</td>
<td>53</td>
<td>+23</td>
</tr>
<tr>
<td>100 to 999</td>
<td>%</td>
<td>33</td>
<td>45</td>
<td>+12</td>
</tr>
<tr>
<td>1000+</td>
<td>%</td>
<td>33</td>
<td>48</td>
<td>+15</td>
</tr>
<tr>
<td><strong>Industrial employees</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>%</td>
<td>33</td>
<td>49</td>
<td>+16</td>
</tr>
<tr>
<td>100 to 999</td>
<td>%</td>
<td>26</td>
<td>47</td>
<td>+21</td>
</tr>
<tr>
<td>1000+</td>
<td>%</td>
<td>28</td>
<td>47</td>
<td>+19</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,473); 2004 Work and Lifelong Learning Survey (N=3,803).

For organizational decision-making the pattern is similar to discretion, both in the major expansion in opportunity for the working class to shape the context of their work and in the specific distribution relating to size of organization. The basic
finding in Table 6.11, showing those reporting no participation, is that smaller organizations (<100) do offer employees—in all broad occupational categories—greater voice in strategic, tactical and operational decision-making. The difference between medium organizations (100 to 999) and large organizations (1000+) is mixed. Those in managerial and supervisory positions enjoy less participation as the organization increases in size, a change from 1983. In particular, managers’ participation in decision-making declined in large organizations while increasing significantly in medium sized ones. For supervisors, half of whom in medium and large organizations had no involvement in 1983, gains were made in all organizations, particularly medium sized organizations. For specialists in 2004 the critical difference appears to be between those in organizations under 100 employees and over 1000 employees, similar to 1983. Specialists working in large organizations experienced the largest growth in involvement in decision-making between 1983 and 2004, but those working in small organizations still enjoyed the most involvement with almost two-thirds participating in some way. This may partially counteract or at least limit the falling discretion for specialists in general. Among service and industrial occupations, involvement in 1983 and 2004 was higher in smaller organizations. Those in medium sized organizations experienced the least increase in involvement, and by 2004 those in organizations with 1000 or more employees report greater involvement than those in medium sized organizations. This is a finding that suggests further research, which I outline more fully in the Conclusion.
Table 6.11. No Opportunity to Participate in Organizational Decisions by Occupational Group, Canadian Employees, 2004

<table>
<thead>
<tr>
<th># of Employees</th>
<th>1983</th>
<th>2004</th>
<th>Change*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>12</td>
<td>13</td>
<td>+1</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>38</td>
<td>22</td>
<td>-16</td>
</tr>
<tr>
<td>1000+ %</td>
<td>18</td>
<td>27</td>
<td>+9</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>29</td>
<td>21</td>
<td>-8</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>56</td>
<td>28</td>
<td>-28</td>
</tr>
<tr>
<td>1000+ %</td>
<td>59</td>
<td>42</td>
<td>-17</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>47</td>
<td>38</td>
<td>-9</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>57</td>
<td>47</td>
<td>-10</td>
</tr>
<tr>
<td>1000+ %</td>
<td>62</td>
<td>46</td>
<td>-16</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>83</td>
<td>53</td>
<td>-30</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>90</td>
<td>63</td>
<td>-27</td>
</tr>
<tr>
<td>1000+ %</td>
<td>91</td>
<td>54</td>
<td>-37</td>
</tr>
<tr>
<td>&lt;100 %</td>
<td>87</td>
<td>53</td>
<td>-34</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td>94</td>
<td>72</td>
<td>-22</td>
</tr>
<tr>
<td>1000+ %</td>
<td>95</td>
<td>63</td>
<td>-32</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,473); 2004 Work and Lifelong Learning Survey (N=3,703).

* Somewhat counter-intuitively, a negative number indicates greater participation.

Table 6.12 includes select specialist occupations and examines distribution of opportunities to design work all or most of the time, and exclusion from decision-making. It includes just data from 2004; as a snapshot of existing conditions it
doesn’t provide a sense of trajectory but it is useful for exposing difference among specialists and, particularly, differences between engineers and IT workers that I examine in more depth in the next chapter. The data focuses on specialist managers, engineers, IT workers, and other specialists likely to be involved in the production, design, and sale of physical commodities and services in technical fields (thus excluding teachers, nurses, and arts and culture specialists). The data suggest that employment for all of the occupations in Table 6.12 tends towards bifurcation, except for specialist managers. Specialist managers, accountants, engineers and IT workers are most likely to be employed in large organizations, with nearly half of IT workers, engineers, accountants and specialist managers employed in organizations with 1000 or more employees. Concerning discretionary opportunities, for specialist managers and IT workers it does not appear to matter what size organization they are in: just under a third report designing their work all or most of the time. For accountants and business analysts, technologists and specialist support, and engineers the highest levels of discretion are found in medium sized organizations. Involvement in decision-making processes also tends toward slight bifurcation except for specialist managers and IT workers. For specialist managers, there is a clear, negative correlation between size of organization and involvement. While specialist managers are advantaged compared to non-managerial specialists when it comes to involvement, a finding that isn’t particularly surprising, the high percentage working in large organizations suggests that ascendance into management may not be an entirely desirable career path. Interestingly, when comparing engineers and IT workers, the latter are only slightly less involved in
decision-making in small organizations; however, when examined by medium and large organization, the comparative exclusion of IT workers is dramatic. Nearly three-quarters of IT workers in mid-sized organizations
Table 6.12. Employment by Organizational Size, Opportunity to Design Work, and Exclusion from Organizational Decisions by Occupational Group, Select Specialist Employees, 2004

<table>
<thead>
<tr>
<th></th>
<th># of Employees</th>
<th>Distribution of Specialist Group</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specialist Managers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 %</td>
<td></td>
<td>25</td>
<td>73</td>
<td>9</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td></td>
<td>32</td>
<td>76</td>
<td>19</td>
</tr>
<tr>
<td>1000+ %</td>
<td></td>
<td>43</td>
<td>67</td>
<td>25</td>
</tr>
<tr>
<td><strong>Accountants &amp; Business Analysts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 %</td>
<td></td>
<td>30</td>
<td>71</td>
<td>30</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td></td>
<td>23</td>
<td>81</td>
<td>26</td>
</tr>
<tr>
<td>1000+ %</td>
<td></td>
<td>47</td>
<td>60</td>
<td>39</td>
</tr>
<tr>
<td><strong>Engineers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 %</td>
<td></td>
<td>33</td>
<td>67</td>
<td>28</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td></td>
<td>24</td>
<td>79</td>
<td>14</td>
</tr>
<tr>
<td>1000+ %</td>
<td></td>
<td>44</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td><strong>IT Workers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 %</td>
<td></td>
<td>30</td>
<td>61</td>
<td>39</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td></td>
<td>22</td>
<td>59</td>
<td>73</td>
</tr>
<tr>
<td>1000+ %</td>
<td></td>
<td>48</td>
<td>61</td>
<td>52</td>
</tr>
<tr>
<td><strong>Technologists &amp; Specialist Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 %</td>
<td></td>
<td>42</td>
<td>62</td>
<td>51</td>
</tr>
<tr>
<td>100 to 999 %</td>
<td></td>
<td>20</td>
<td>66</td>
<td>43</td>
</tr>
<tr>
<td>1000+ %</td>
<td></td>
<td>38</td>
<td>53</td>
<td>52</td>
</tr>
</tbody>
</table>

Sources: 2004 Work and Lifelong Learning Survey (Distribution N=1,532; Discretion N=1,529; Decision N=1,481).

report no involvement. The only good news here for IT workers is that just a fifth are employed in organizations with 101 to 999 employees. But around half are
employed in large organizations, and fully half of these IT workers are entirely excluded from decision-making. Engineers are also predominantly employed in large organizations (44 percent), and a third of these engineers have no voice in deciding the context of their work. IT workers thus appear closer in involvement overall to technologists and specialist support staff than to engineers.

**Conclusion**

So far I have presented Canadian evidence that the proportion of specialists’ reporting they make decisions about immediate, day-to-day tasks all or most of the time declined from 84 percent to 68 percent between 1983 and 2004. This drop occurred even while almost two-thirds of specialists reported the complexity of their jobs increased, and while fewer were excluded from involvement in organizational decisions around budgets, staffing, product, services and so on (from around 55 percent in 1983 to around 45 percent in 2004). The pattern among managers was very similar on these three variables. Among non-specialist and non-managerial occupations in service and industrial jobs, the trend was uniformly positive: gains were made in job complexity, discretionary activity and involvement in organizational decisions.

A closer examination of specialist occupations reveals substantial and possibly growing heterogeneity in discretionary and decision-making opportunities. The changes for specialists and managers don’t appear to have been due to demographic changes (e.g., more women, who have historically faced less opportunities for discretionary activity, entering specialist occupations). Nor do the changes appear due to compositional changes in the sorts of occupations included in
the specialist category (e.g., faster growth in lower-discretion jobs like technologist or nurse). Rather, the drop in discretion appears to be due to changes in the structure and content of work within some specialist and managerial occupations. Engineering and IT work, two occupations closely aligned in their relationship to technology, are nearly identical in reported opportunities for discretionary activity yet markedly different in their involvement in organizational decisions. Why this is so is not clear from the quantitative data.

Larger organizations offer managers and specialists fewer opportunities for discretion and less involvement in organizational decision-making. The distribution of managers did not change much between 1983 and 2004, while there was a large change in distribution among specialists. The percentage of specialists in small organizations declined by nearly one-fifth, while those in large organizations of more than 1000 grew by nearly 15 percent. Disaggregating specialists when examining size of organization reveals that most engineers and IT workers are employed in large organizations. Engineers' highest levels of discretion and involvement are in mid-sized organizations (100-999 employees) while mid-sized organizations are where IT workers are most excluded. For both, however, smaller is still better.

The findings on rising technical, discretionary, and decision-making opportunities for the traditional working class certainly appears to challenge pessimistic claims of degraded and fragmented work (e.g., Braverman, though he focused on relations of production in the U.S. and, as Clement and Myles (1994) showed, relations of control and trends toward routinization are different in the U.S.
and Canada). Superficially, the broad findings on managers and specialists also challenge optimistic claims about growing independence and power of the knowledge class in Canada. Caution is warranted here, however, in both cases. It is not clear from the survey data if gains by service and industrial workers imply actual changes in the social relations of production, and if declining discretion represents a real loss of power for managers or specialists or simply reflects a more collaborative, integrated labour process in which their voice over operational and strategic decision-making is actually expanding. I will argue over the next few chapters that it is all of these things: some specialists and managers are losing autonomy within more collaborative, bureaucratized labour processes but that many specialist occupations and those in managerial positions are finding both new and familiar ways to maintain the traditional division between conception and execution.

In the next chapter I present interview data. In seeking to strengthen the empirical foundation of my investigation, I explore the occupational, technological, and organizational variation and similarities that further illuminate the discretionary and decision-making results for engineers and IT workers, specifically, and managers and specialists more generally.
Chapter Seven – The Working Lives of Engineers and Information Technology Workers

Introduction

In presenting findings from the interviews I begin with engineers and then move to IT workers. Within each occupation, I present the “story” of each individual separately but thematically link the experiences of each to issues of job complexity, autonomy-control, and the relationship of these two the division of labour and involvement in organizational decision-making. At the end of each occupation-focused section I include a subsection that uses interview material to draw out what has emerged as fundamental resources, structures, tools and products that help explain the difference and similarities in outcomes for engineers and IT workers.

My findings suggest that, against claims that specialized knowledge is now so organizationally important as to make closure unnecessary, engineers’ ability to control access to their profession—and thus to maintain a clear division of labour—remains a fundamental advantage among specialists. But, like doctors, lawyers, nurses and teachers, the physicality of engineers’ work appears as an important contributor to their ability to sustain power and voice in the face of bureaucratic structures. In contrast, IT work is highly mobile, change in soft- and hardware happens incredibly quickly, and the knowledge base and labour market is nearly entirely open. While demand for their specialized knowledge continues to grow and
there are pockets of real IT-labour shortages across the country, the lack of closure combined with employers ability to centrally control digital workflows has eroded their quality of and power over work. As the respondents describe, engineers tend to possess (or have negotiated) the ability to influence the operational decisions that directly shape the way they do their jobs in a way that IT workers generally don't. *The autonomy-control that appears similar in the quantitative data is thus revealed as qualitatively different*, with IT workers able to make decisions about their tasks but with much less control than engineers over deadlines, collaborative opportunities, project planning, human resource allocation, and so on. One interesting finding that emerges is that IT workers are increasingly turning their rationalizing gaze on each other, and that they lack either the structural-professional or ideological basis to resist demands that they do so.

**The Interviews**

I conducted in-depth, primarily open-ended interviews with six engineers and six IT workers, all Canadian. The group of engineers I spoke with are similar to the broader engineering community in Canada in its: high proportion of males, middle age, likelihood of being in managerial role, employment in large organizations, residence in Ontario, and high percentage of Professional Engineer (P.Eng) credential possession. Where my sample is atypical is in its high number of individuals with graduate and/or professional education, specialization in mechanical engineering, and employment in extractive industries. Income and unionization comparison is less clear, while data on race and ethnicity in the engineering workforce in Canada were not available. The IT group I spoke with also
included six individuals, including four women and two people of Asian descent (one male and one female). All live in Ontario. The IT sector is (still) dominated by males; the primary difference between the participants in my study and the IT workforce in Canada is the proportion of women I spoke with. The IT workers I interviewed are also slightly older than the national average, somewhat better educated, more likely to work as “analysts,” and less likely to be in a job that demands some form of certification. Similar to the IT workforce in Canada, the majority of the individuals I spoke with were not in management, not unionized, and worked in “professional, scientific, and technical services” (a broad category as defined by the 2002 North American Industrial Classification System, or NAICS).

While the similarities and differences between IT workers in my study and the national IT workforce, and between engineers and the engineering workforce in Canada, are important to note, few qualitative studies are going to be perfect matches with the broader population. A match, in any case and in this case, is not the point; the goal is to use the semi-structured interviews to draw out a richer and more nuanced understanding of workplace relations that is not available in survey data. It is towards this excavation of personal stories and insights into particular experiences that I now turn.

**Engineers**

Engineers in many advanced capitalist nations have established the mechanisms usually associated with a profession, such as legislation that stipulates who can and cannot practice, a self-governing association that grants a right-to-practice credential and has the authority to discipline members and enforce
standards, and control over tertiary education programs. The degree of engineers’ professionalization varies (Meiksins, Smith, & Berner, 1996), with engineers in Canada relatively successful in achieving occupational closure and legal protection of their primary activities.

Oversight of engineering practices in Canada is delegated to provinces and territories. In Ontario, for example, Professional Engineers Ontario (PEO) is the legislated body that licenses engineers (granting the Professional Engineer, or P.Eng, designation), disciplines members, authorizes companies seeking to offer engineering services, and enforces right to and standards of practice. Just about any activity that involves the application of “engineering principles” in Ontario falls under the PEO’s purview, and the role of the PEO has been strengthened via numerous amendments to Ontario’s Professional Engineers Act. Equivalent organizations exist across Canada, and coordinate via the Canadian Council of Professional Engineers (CCPE). Associated with the CCPE are the Canadian Engineering Qualifications Board and the Canadian Engineering Accreditation Board, which accredits undergraduate engineering programs and updates standards based on monitoring of engineering education in other countries. Education programs for engineers in Canada are reviewed and largely dictated by Professional Engineers, and it is expected that teaching faculty will also be P.Eng holders.

As noted earlier in the examination of survey data, around a third of engineers in Canada aren’t part of a professional association, which I interpret as indicating they don’t hold a P.Eng designation. As the data in the previous chapter show, and other studies corroborate (D. K. Brown, 2001), engineers who are part of
their professional association enjoy a fuller role in making organizational decisions about the context of their work (e.g., budget setting, staffing, deciding on multi-department project timelines, how organizational resources will be used, etc.). Still, almost two-thirds of unassociated engineers participate in organizational decisions, and membership in an association appears to have only a very weak effect on opportunities for discretion. Related, the need for P.Eng designation to practice engineering activities should not be overstated. Besides the engineers working without the P.Eng or other credential/association membership, growing numbers of technologists are seeking to participate in a fuller range of engineering activities without supervision by a P.Eng (Mastromatteo, 2007). It is also not clear how many organizations are using technologists to perform work normally performed by engineers. Importantly, engineers, unlike professions such as doctors, do not bargain collectively. These issues link to a number of broader themes that I explore below in the interviews with engineers. In particular, I examine the relationship among occupational (professional) closure, the nature of engineers’ work in technology-intensive labour processes, and the opportunity engineers have to participate in the full scope of projects they are involved in. In examining these relationships, I draw out what engineers mean when they speak of designing their own work and participating in organizational decisions in light of their specific activities and organizational type.

Control and Organization in Engineering Work

The engineers I spoke to almost all described the ability to plan projects, coordinate with other staff, use or at least negotiate human and technical resources,
and see projects through to completion. In other words, they enjoyed substantial
debated authority and thus participated in substantive ways in operational
decisions that affect their work. None of the engineers reported involvement in
high-level, long-term strategic decision-making.

**Chad: Glocal Engineering**

Chad is a P.Eng in his late 40s with training in mechanical engineering. He is
an executive at an engineering firm in Alberta that designs, builds and promotes
carbon sequestration technology for the oil and gas industry. Although he is deemed
an “executive” Chad reports that he doesn’t officially manage anyone. Occasionally
he will take on a leadership role in a project but generally, and increasingly, his
work takes him to conferences, to meetings with companies working to extract oil
from Alberta’s tar sands, and overseas, primarily to oil-producing nations in the
Middle East. Belonging to many engineering associations, and subscribing to a
variety of top engineering journals, Chad’s position appears to be somewhere
between R&D and a “rainmaker,” and descriptions of the sorts of events he attends
and sometimes hosts suggests he is highly trusted by his CEO to be the “face” of the
company abroad.130 In the actual practice of engineering, Chad has few complaints
about his job.

Calling his organization “smaller,” he believes this allows for a flatter
managerial structure, with engineers comprising 50 percent of the 100 or so staff.
The rest of the staff is made up of drafters (almost exclusively male) and a small

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130 Canada is the third largest exporter of engineering services after the U.S. and UK (O’Grady, 2009a).
number of technologists. Chad describes a professional-collegial organizational culture where project teams are ad hoc, with teams assembled specifically for needs of individual bids. Not only is the organization fairly flat but also managerial oversight is not intense:

Along with our loose structure is a very loose project management scheme as well, and each project manager runs his project as he sees fit – as long as they don’t go off the rails everyone is happy. There’s no micro-management until things go awry.

The interaction among engineers tends to be collegial, and the only cliques that exist have formed mainly around age but are not rigid and not antagonistic. While the engineers interact as peers, and project leads can change, the division of labour is fairly stark between the engineers and the support staff. The subordinate role of drafters and other non-engineering staff had a taken-for-granted, unproblematic quality in our discussion, despite probes into the relationship.

In many ways, then, Chad’s company exhibits many of the traits associated with what has been called a professional service firm (PSF) or knowledge-intensive organization. There are relatively few layers of hierarchy, strong links with clients, distributed authority, and peer control of work. But PSFs are usually associated with professional organizations structured around a partnership, where professionals are both owner and labour (Hinings, 2005). Chad is an employee, however, and the company is controlled by a single-owner. While anyone can go visit the company’s president anytime they want, and despite the lack of micromanaging, the structure of the organization is such that Chad is often excluded from strategic decision-making, and from operational decisions not directly related to the projects he is involved in.
After trying and failing to initiate a mentoring program with the goal of retaining more young engineers, Chad has realized the boundaries of his powers:

I look after the people in my group. I can’t go beyond that. It’s not my place, to be honest with you. It’s the company that belongs to the boss and that’s the way the boss wants it run, so that’s how I fit in. You know, you fight a lot of battles in your life and some of them you win and some of them you lose, and you just move on. And I think that’s one that I lost. I think around here the attitude is that you can always hire senior people. We hire junior people to do lower-level tasks and senior people to do the senior-level tasks and things move on. You know, there’s a lot of turn-over in this business anyway...

The turn-over that Chad notes may reflect the boom times that were being enjoyed in Alberta oil and gas sector at the time of the interview. As well, the strategy of simply hiring engineers and not cultivating from within described by Chad appears to fly in the face of claims of an engineering “shortage” in Canada (e.g., Petroleum Human Resources Council of Canada, 2009) and the U.S., with mounting evidence that there are enough engineers to meet future demand, with many currently working in other fields but available to meet rising demand (Lowell, Salzman, Bernstein, & Henderson, 2009).

In the passage above we also see evidence of unevenness in Chad's power. As noted above, engineers often enjoy delegated power but lack what has been called “negotiated authority” (Livingstone & Raykov, 2008) or the power of worker collectives (in the form of either unions or collective bargaining associations) to establish formalized rules around roles and wages. Engineers do control access to their occupation and their activities are frequently protected by legislation, though, giving them other kinds of power. Such extra-workplace factors impact, engineers in my sample suggested, both on classic authority relations (as between managers and
non-managers) and on what I call organizational decision-making. This latter form of authority is less formal (in the sense of contracts and reporting structures), reflecting instead a more contingent participation in decision-making outside the boundaries of one's specific job. Chad's authority in operational matters relating to project completion is quite high, and he is delegated substantial power over a variety of tasks. For example, Chad conducts seminars and training around the globe and is granted control to plan events, liaise with local interested firms and professional groups, present information and company results at conferences, and initiate new business.

**Robert: The Environment of Engineering**

Robert, a young environmental engineer, describes an organization that hires primarily those engineers with P.Eng designation or recent graduates who are committed to acquiring their P.Eng (Robert was in the latter category, and gained his P.Eng between our first and follow-up discussions). Much of the environmental engineering work the firm performs is complex and sometimes politically charged, so the firm must ensure that its engineers' credentials and experience contribute to successful bids and defensible solutions. Paired with a mentor, a senior engineer, Robert reports that his company has shown substantial confidence in him after less than a year, involving him in delivering quotes to clients, marshalling other engineers to work on projects, and leading projects on-site, including directing general labour and workers in specific trades. While seemingly young to be taking on such responsibilities, a 2002 survey by Engineers Canada found that around a third of engineers in their 20s (with their P.Eng) have at least some managerial
experience through the delegation of authority, while over two-thirds of those in their 30s and over 80 percent of those older have at least some managerial experience (Ekos Research Associates Inc., 2003). Robert, then, is neither exceptional nor typical in his experience leading teams and worksites, and it is the structure of decision-making in his organization that is of primary importance here.

Asked how decisions are made on teams of engineers, Robert explains that project managers coordinate activities but that business and engineering decisions are made collectively:

There are client relationship managers who acquire the work and then pass it to project managers. Project managers then create a team to get the work done. It’s very egalitarian, they ask around and see who’s available and what qualifications you have. They work inter-office, it’s not a very “divisional” company, its very integrated even though it’s very spread out.

When probed about the structure of decision-making, and how decisions are finally arrived at within and across project teams, Robert describes a process that is neither democratic nor authoritarian. In some ways it reflects an academic setting, where collegiality and direct expression of opinion often coexist, and presents a version of an idealized private-sector professional workplace (see, for example, Kleinman & Vallas, 2001) or what Frenkel et al. (1999) call a knowledge-intensive organization. Robert described the decision-making process as sometimes chaotic and even confrontational, where engineers would gather to debate all aspects of a specific project, be it the proposal, internal staff, subcontractors, technical issues and so on. Where consensus is not reached, which Robert suggests happens quite often, disagreeing parties simply remove themselves from projects. Such a process is, for Robert, simultaneously rewarding and frustrating:
There’s been conflict over that even [decision-making]. It’s almost too democratic, everyone gets their [sic] say. That’s just how the company is, or at least is in this office. Because it’s spread out over so many offices the decision can run through other offices so democratic voting in this office wouldn’t necessarily solve anything.

Despite these problems, and sometimes because of them, Robert is happy with his work and expressed an understanding that he is privileged to participate in decisions around work and working conditions.

Relating to the sorts of skills required in such a non-hierarchical and challenging working environment, and how the culture and business of engineering is changing in general, Robert reports that:

Soft skills have been the biggest for me in getting new jobs and promoting and using my experience to get new jobs, new types of work. I think that if you can market those soft skills you can get into any aspect [of engineering]. I think that the modern generation has some incredible transferable skills, at least technically, that will just blow the doors off how work will be done in the future...I think those soft skills will mold how business is done. The technical skills are the backbone, obviously, it’s what you model the company around, that’s what you sell, but how you do business is based on your soft skill: how you communicate, how you use your technology.

It is admittedly difficult to discern what part of Robert’s pronouncement is based on experience and what part emerges from his recent schooling, where instruction and texts in engineering programs frequently promote such soft skills as key to success in the knowledge-based economy (Hissey, 2000). What is clear is that Robert has adopted many of the humanist tenets of contemporary organizational and managerial literature, where profit and quality of work are mutually constitutive. The experiences of many of the other engineers I spoke with suggest that humanist managerial theories (with accompanying emphases on organizational culture and
transformative leadership) are taking root (if not already firmly entrenched) within engineering organizations and departments.

Despite being happy with his job, and advancing rapidly in opportunities to coordinate projects, in follow-up interviews Robert revealed that he had entered a full-time Master's of Business Administration (MBA) program. The last time we spoke Robert was planning his wedding and considering leaving his job to pursue his MBA full time, with the hope this credential would allow him to move more quickly into senior roles and potentially other fields.

**Trevor: Safety and Discretion in the Mine**

Trevor is a thirty-something mechanical engineer who is head of safety at a mine in central Canadian that employees fewer than 500 individuals. He, like Chad, moved into management relatively early in his career. Married with children, Trevor reports working long hours but is generally happy in his job. Living in a small town, he associates with many of the mine’s non-engineering workforce in social and recreational activities. He discussed at length the shift in organizational culture that has impacted the work of engineers in the organization, and how management and engineers interact with one another, and with the non-engineering workforce. As Trevor tells it, the changes in his organization have been born more out of management philosophy than technical imperatives:

If anything, we’ve had a change in management style. We’ve gone from an old-school, hard-line style where the manager pounds his fist on the table to more laidback, transformational leadership. So we’ve started to train our people more. There used to be a bias that when people came out of school the company wasn’t going to send them anywhere for training. But starting 10 years ago that began to change.
Trevor explained that the change in style was partly personality driven, “We’re a publicly traded company and a different CEO came on board and brought different people into head office and that just led to a different direction.”

What this has meant for Trevor is a fairly high level of autonomy. He places orders on his own (without sign-off by someone senior to him) as long as he remains within budget and the item or service is considered part of “regular” maintenance or safety regulations. If the item or service is “new” he still has sign-off authority as long as it is less than ten thousand dollars. Trevor reports that he frequently performs self-directed research and meets with sales people and staff about new products and procedures, and that he is compelled to undertake informal learning nearly every day based on the nature of his work. He also has organizational support (both financial and release-time) to pursue more formal training, which he tries to participate in though he notes it is difficult with the demands of his job, rural location that is some distance from most courses, and family responsibilities.

This growth in trust has not just been extended to managers like Trevor. Across the various engineering specialties at the mine—be it safety, exploration, environmental, drilling and explosives, or geostatistics—greater emphasis has been placed on using both the creativity and experience of the engineers:

We’ve always given our engineers lots of freedom to develop solutions. Now, there are people with more and less experience so there are constraints because they know what works and what doesn’t work but we’re not afraid to try new things either. Obviously, too, you have to stay in budget and that but I don’t really think it has changed...Now, the problem is that everyone is busy but we have trust in our engineers, we know everyone will do a decent job.
From Trevor’s description here, and through the rest of our conversation, it is apparent that the atmosphere within the engineering department was, as in the organizations of nearly all the engineers I spoke with, collegial with high levels of involvement in decision-making at the operational level. Older engineers act as mentors guiding the younger engineers. In contrast to Chad’s company, the mining company Trevor works for endeavours to attract and retain engineers. The mentoring among engineers at the mine is not formalized, however, but is part of the departmental culture.

With so many workers underground, largely out of direct sight, Trevor’s job of ensuring the mine is safe is a difficult one. He reports seeking to empower workers, both engineers and the general workforce, in order to get everyone’s participation in reporting on and preventing dangerous situations from arising. But the trend toward trust in the mine has, he acknowledges, had much less impact on non-engineering employees. Trevor sees limitations based on a range of factors including compliance issues (e.g., sign-offs on safety equipment), rigidity inherent in contracts with workers (e.g., a formalized division of labour relating to monitoring safety and maintenance issues, and based on activities designated “engineering” in legislation), resistance to change that lingers among various managers, and directives and procedures entrenched within the corporate bureaucracy. He illustrates the change, or lack thereof, with the following story:

Here’s an example of our old culture that’s still there. We’re different than a lot of other places in that my subordinates can’t just go buy something, it has to be signed by me and that’s a hold-over from our previous culture. Whether it’s a first-line foreman or a second-line general foreman, if they need parts for a vehicle they still have to run it by me. That’s one of those holdovers that we’d like to look at relaxing but it’s a corporate thing.
The trust shown by management, or delegated authority, is qualified and bounded. While Chad feels the constraints on non-engineers are largely due to corporate myopia, he recognizes and there can be little doubt that the privatized nature of engineering knowledge and legislation protecting engineering activity also limit the extent to which senior management wants to and can delegate authority to non-engineers.

Trevor's working experiences reinforce the claim that engineers tend to be at the centre of operational decision-making and are often involved in strategic policy-making. Certainly Trevor's role as a manager enhances his involvement in all forms of decision-making, but his description of the working conditions for engineers suggests a culture similar to Chad's firm with engineers allowed to manage themselves, each other, and junior engineers. The primary difference between Trevor and Chad is that the mine is far more hierarchical and bureaucratic structure with another corporate hierarchy overlaid on top. The engineers at the mine might best be described as a “professional department” (Hining, 2005) within what is otherwise an extraction-focused organization populated by a variety of occupations that I have so far aggregated as “industrial workers,” and which includes trades and non-specialist labour. Trevor has moved outside of engineering proper, and regrets that he can't do more actual engineering activity. Instead, his managerial commitments take up most of his time.

**Hui: Engineering Paper Reactors**

Hui, a forty-something engineer in the safety department at a nuclear facility in central Canada, describes an industry and organization that must, like Trevor's,
achieve “high reliability” (Pool, 1999: pp. 258-263). His primary responsibility is designing tests of actual equipment and simulations of problems, describing what he does as working on “paper reactors.”\textsuperscript{131} By this, Hui means that he primarily works on complex, theoretical safety and performance issues and is not involved in carrying out the frequent safety drills or maintenance identified by his department. Hui reports being required to have his P.Eng but rarely having any need for it.

Somewhat different than most of the other engineers I spoke with, Hui feels the demand for new knowledge is subordinated to a demand for deep engagement with existing knowledge:

I don’t think [skills have changed]. The nuclear industry is different than IT. In IT, after six months your skills need to be updated. After six months it’s already too old. In the nuclear business sometimes the old is better, as it’s proven. So that’s why we sometimes have a design that is very old.

The longevity of designs in the nuclear industry mean that engineers accumulate massive stores of general and specific knowledge about the reactor(s) they are working on. Within his department, in lieu of any “knowledge repository,” the engineers and technical staff are mentored according to need when they arrive and workshops are provided for those leaving to pass along specific knowledge.

Hui reports that he is free (and encouraged) to make changes to safety procedures and equipment, as well as to plan and conduct safety experiments as

\textsuperscript{131} This is a term that originated with Hyman Rickover, a pioneer of nuclear energy within the U.S. Navy, who went on to oversee the construction of hundreds of nuclear plants. Reflecting on the great difficulty of actually building and maintaining nuclear facilities, Rickover distinguished between “paper reactors”— simple, small, cheap, and quickly built—and “real reactors”—complicated, large, and behind schedule (Pool, 1997).
long as he can justify the reason. While the department has a set budget, it is ample; safety is explicitly prioritized across the structures that impact Hui’s work: his managers, the organization that runs the reactor, and the industry in Canada and worldwide.\textsuperscript{132} The de-emphasis on cost can largely be explained by the nature of his industry, with its preoccupation with safety (particularly in light of Three Mile Island and Chernobyl, two well-known nuclear accidents). This preoccupation in turn leads to an extensive formalized training system and employer-paid, mandatory upgrading in Hui’s department.

As four of the six engineers I spoke with are in management, and some three-quarters of all engineers in Canada with their P.Eng have managerial experience, Hui is also unusual in his disinterest in following this usual career path. Although Hui reports taking on leadership roles in small-scale projects from time-to-time, he describes how he was encouraged to enter management but had turned the promotion down in order to ensure he still has time with his young family.

I feel as a manager your typical life is longer hours and more commitment, and you are being squeezed from above and below. I have two young children and I want to be more family-oriented. After seven and a half hours I want to go home.

In addition, Hui’s observations have led him to conclude that managers do around 70 percent supervision and only 30 percent technical work. Hui explained that he enjoys and wants to continue doing technical work, and is satisfied with his salary.

\textsuperscript{132} Risk assessment in the nuclear industry shifted to a more conservative approach after the Three-Mile Island incident in 1979 (Pool, 1997). The nuclear industry is proactive (e.g., Canadian Nuclear Association, 2010) and at times aggressive (e.g., Osborne, 2007) in promoting its message of safety and reliability.
Matt: No Time for Micro-Managing

Involved in the science of and practical research on safety, similar to Trevor, Matt trained in southern California as an aerospace engineer. He worked there in the field and related fields for a number of years before a series of moves initiated by so-called “head-hunters” led him to Canada where he began work at an auto-parts corporation. Matt describes an enviable working environment where he was groomed for management (including having his MBA paid for) within the company he works for almost from the day he arrived. His responsibilities are safety and quality of the products for auto interiors that ship to numerous high-end and mass automakers. In his mid-40s, in his managerial role Matt reports being somewhat removed from day-to-day engineering activities. He still values his engineering knowledge, however, as his managerial duties require high levels of technical knowledge. For him, progression into management was a natural career step.

He describes doing his best to foster a self-starting mentality among the technicians and engineers that work for him. Partly this is because he has experienced both oppressive and empowering managerial styles, and believes that people will always excel where they are trusted. But partly his commitment to semi-autonomy for his technologist employees emerges from the job itself: his staff has to use their creativity to invent scenarios where products might fail. The company needs the employees’ creativity—that is their job:

For me it’s a lack of institutional factors that allows me to be most creative. If you have a lot of paperwork to fill out before you use a tool or run a machine or get someone to do some diagnostics, then you tend to get bogged down in protocol instead of solving the problem.
He argues, too, that he simply doesn’t have the time to plan and coordinate all of the safety design work. Instead of monitoring his employees he spends what little free time he has, in light of extensive travel as part of his managerial responsibilities, working to nurture his employees’ confidence to pursue their own ideas. According to Matt “micromanaging” would simply be too inefficient.

**Trisha: Uncredentialed and Undeterred**

Trisha works at a small pipe manufacturing company in Alberta that deals exclusively with the oil and gas industry. She is without any sort of engineering education or credential although she does the work of an engineer, including consulting with clients and designing physical piping systems, and manages engineers. Family commitments and a semi-rural location mean that acquiring an engineering degree is not feasible. She entered engineering work only when her family, which owns the business, couldn’t find an engineer. She acknowledges she initially acquired the job because it is a family company but that her father, who runs the business, treats her employment as “strictly business,” would move or remove her if she wasn’t doing a good job, and is only willing to pay her “market wages.” Even though it is a family business, or perhaps because it is a family business, her salary is much lower than the engineers she manages (up to $50,000 less per year).

While she must have all of her plans signed off by a P.Eng (who the company contracts for this sole purpose), she describes this extra step as a mere formality and that this contracted P.Eng rarely finds any issues with her designs. Despite the strength of her designs, she reports that many of the engineers working in her
company resent being managed by someone not officially qualified as an engineer. She also reports experiencing frequent sexism both within her company and in dealings with clients. Trisha’s designs are often questioned by engineers working for clients, yet in each instance the local governing body has supported her work.

Trisha is confident in her experientially gained engineering skills, ridiculing many of the new engineers she manages for their inability to understand that engineering is mostly about localized, practical knowledge:

They [new engineers] are taught what they’re taught in school, and they think that’s the way the world should be – out of a book. But in real life, in a real situation, that’s not how it goes. Just because that’s the way your book says something is going to happen it doesn’t mean it’ll happen that way. You can read your formulas and your calculations and something will always be different in a real life situation. If your books say this might happen with your pipeline it doesn’t mean it’s going to happen. They get caught up thinking that if a book says it’s going to be one way that’s the one way it’s going to be...they don’t want to learn that real life comes first, it doesn’t matter what your book says. [When things don’t work] they panic, “That’s not what the books say.” [Trisha, as manager and mentor, tells them] “It’s ok, we’ll figure it out. We’ll try different things.”

Obviously there are other dynamics influencing Trisha’s frustration with new engineers, including credentialism and sexism. But her point about “real life” can be read as further reinforcement that the application of localized, specific knowledge is vital for much of the work performed by engineers.

**Hands-On Work and Occupational Closure: Engineers’ Advantage**

As the data in the previous chapter show, and other studies corroborate (Brown, 2001), engineers who have gained their professional certification enjoy a fuller role in making decisions about the context of their work. The P.Eng, in combination with legal framework in Canada built around the engineering profession, certainly provides a structural feature that strongly encourages (and
sometimes mandates) employers to involve engineers in the full scope of project and product planning. The requirement for Canadian engineers with their P.Eng to perform and/or manage many engineering activities also sets up a barrier to the outsourcing of engineering work and/or the delegation of engineering work to technologists in the engineering field. Yet a number of the engineers I spoke with, like Trisha does in the long quote above, point to a different, complementary factor that provides them with power and inhibits the outsourcing and offshoring of their work: the tangible nature of their work, demanding their immediate physical proximity.

The specificity and localized nature of engineering work is a theme that emerged in discussions with Chad, who is an executive at an engineering firm in Alberta specializing in carbon sequestration. Much of his work is in the Middle East, and he sees growing business around the world in light of Canada’s engineers’ solid reputation, generally, and scarce, experientially gained expertise in carbon sequestration technologies, specifically. Chad sees outsourcing and offshoring as largely inevitable and desirable yet, at the same time, unlikely to impact on his work or the work of other engineers:

There’re a lot of jobs that you can outsource immediately, like a call centre, even drafting. A lot of people outsource drafting to India where the cost is a fraction and all this can be done electronically so they can just send it down the wire and it’s back in a day and done at a fraction of the cost. I’m not sure you can do it quite that easily with engineering which [sic] still requires manpower and interpretation and brainpower.

Certainly, Chad does less “hands on” work than he did prior to entering his executive position, but indicates that his current consulting to foreign companies and governments is entirely dependent on his experience and his ongoing work in
Alberta where he regularly travels to sites to work with existing and potential clients.

In talking about why he succeeded as an engineer, Matt, the aerospace engineer now managing a department responsible for safety at a car parts company, inadvertently sheds light on the physicality and specificity of the engineering work that potentially helps the occupation in Canada resist routinization, automation, and outsourcing. He explains that a problem in engineering:

> [a]lways starts out as an interesting challenge. When you go down there and there are a bunch of people scratching their heads about how to solve something that’s the time for someone to put their hands on the machine and listen to what it’s telling them. You gotta listen to the machine. Every machine makes a happy sound. The key to fixing a machine is to know what its happy sound is. There are lots of young guys out there who will never figure this out. There are lots of old guys out there who have tried to figure it out but can’t.

Matt’s (anthropomorphized) description of the physical connection needed to work successfully with machine technology powerfully illustrates the importance of many engineers’ proximity to the object of their work. His comment pointing to the rarity of the ability to “listen to the machine” suggests merit-based stratification within engineering, but it also points to a potential challenge to the engineering profession; that is, there are many unaccredited engineers and technologists who are adept at “listening to the machine” and will do the work for far less money. Trisha is one of those people.

Even though Trisha lacks any formal engineering education or credentials, she believes, as many of the other engineers I spoke with believe, that most engineering work is immune to offshoring or automating:
I’m not worried about that [offshoring]. There are so many different codes that you have to build by that even if they did have the right software they won’t have the right knowledge to do the job. I didn’t learn by software, I learned by hand...there’re always problems with the software, with some glitch.

Even as she herself is “outsourced” engineering labour, and serves as evidence that engineering labour is not immune to the search for cheaper labour, she presents evidence that the search for cheaper engineering labour would hit both a legislative and worker-proximity barrier.

Robert addresses the issue of offshoring as well, and his thoughts on the localized nature of engineering are helpful for predicting the future of the occupation. Interview evidence from Robert also leads us to the issue of professional culture and the sort of attitudes that are fostered among engineers and in engineering firms. Robert is fairly sure his work is secure based on the nature of his work, which he describes as visiting sites, conducting tests and taking samples of pollutants, and being physically involved in the execution of the projects he’s a part of or leading. Though he sees some specific tasks that can be delegated, in general he doesn’t see a way that his job could be broken up, as there needs to be continuity on engineering projects among: the person or team that travels to sites to run tests and make the environmental assessment; the person or team writing up the report or proposal on the work needed and what sorts of human and technological resources will be required; and the person or team that oversees the detailed execution of the project at sometimes remote work-sites.

Even as Robert sees his type of engineering as relatively secure he does not discount that some engineering work (even potentially his own) can be outsourced
or offshored, or that government regulation around engineering work and professional designation are important factors in shaping the workplace:

I think that [offshoring] will have more to do with companies supplying products, not in terms of companies supplying knowledge. Consulting is more of a knowledge-based thing, highly regulated. You could have a chemical engineer in Canada and a chemical engineer in India and they cost a fraction of...you know, magnitudes less in India and if they can produce the same result why wouldn't you outsource it?...I would look into [outsourcing] if I was in that situation. I think that would be a smart business play...[Laughs]. With the global economy that’s just the way things work, the way to stay profitable...[Asked if his job was offshored] If my job went? I probably wouldn’t necessarily like it, but I don’t know, we have to adapt to how the market works.

In Robert’s comments above there is not only evidence on the potential of the engineering labour market to change in the future, there is evidence on his broader political-economic attitudes regarding the rightness of market forces and productivity-first thinking. There is also subtle evidence about his attitudes toward the desirability of individual competition for specialized labour.

Robert’s laissez faire stance toward outsourcing is based at least in part on the security that most engineers feel from the legislated protection of their labour: “I think regulation alone will keep job security for a long time.” Robert supports unions for those who need it (“...there are crappy jobs out there...”) but sees engineering as a place where people with coveted technical skills can and should compete for jobs and wages. While pro-labour through his university years, Robert now believes that unions lead to an overvaluing of and encouraging of people who don’t work hard and who aren’t necessarily competent: “The only reason I have moved into project management coordination without a raise is because I’ve had the capability [opportunity] to not be classified.” Regarding the continued
transformation of his political beliefs after working as engineer for just one year,

Robert notes that:

The whole idea of unions in the past was to stand up for the rights of the worker and as I’m being more thrown into a very individualistic, competitive market I go, “Well, I can see how unions benefit people but I can also see how my skills can promote myself as an individual.” So that has changed, and it’s evolution for sure. Who know what I’ll be like when I’m 50. Oh, that’s scary!

The excerpt above is interesting in that Robert recognizes an “evolution” in his outlook.

This change in Robert’s outlook appears, based on the passage below, to be the result of immersion in the culture and practice of engineering. While Robert describes himself as “green” in political orientation and concerned with issues around social justice, when asked if he had changed after entering work as an engineer Robert offers a series of thoughtful introspects:

You know what, that’s interesting, as I’ve gained a salary and the company has RRSP deferred plans you become less liberal on things. Money is a very day-to-day topic, and you...your opinion changes a little bit, at least for me...You’re in high school and you have an idea of environmental engineering as a moral thing and then you go do a co-op job and you’re working to clean up big oil sites and the public doesn’t know and it’s carcinogenic but there’s no real direct contact with the public. You start to become more scientific about your approach. For me, I’ve lost a lot of those passionate ideas to more logical assessments. So, when I see a carcinogen or a contaminant, I’ll look at the risk instead of in the past I would have looked at it and said “That’s a carcinogen, that’s terrible, why the hell is that there? That should be cleaned up by any means necessary.” Well, if the carcinogen is buried 100 metres below ground and has absolutely no contact with any humans or any other kind of environmental system and won’t because it’s on a private property and the water isn’t flowing is it really that big of an issue. You pump it out of the water and then what do you do with it? You expose it to the environment and then there’s more risk. So my opinions have changed based just on my scientific knowledge, and that’s just my technical knowledge. The more I learn, the more I have to really rationally think of things and not be emotionally engaged.
This orientation to a form of risk assessment that deprioritizes humanistic and precautionary concerns is well documented among engineers and technologists (e.g., Pool, 1999). Interestingly, Robert begins with a comment on how the centrality of budgets and profit orient so much of his day-to-day activities, but finishes by naming rationality as the cause and consequence of his ideological transformation.

This mixing and subsequent domination of business concerns and technical rationality over other, competing concerns are not unique to Robert. The interviews with Chad and Matt, in particular, provide additional evidence that an orientation to efficiency is not just compatible with business concerns with profit-maximization but is in fact central to it. This is not a new claim, as engineers’ place at the centre of industrial and even services-dominated capitalism is well documented (Bell, 1973; R. Collins, 1979; Derber et al., 1990). This orientation to efficiency and market among engineers does not seem, however, to be a pivotal factor in their greater power over the organizational decisions that shape the context of their work, however. As I will show in the next section, many IT workers share the same orientation to efficiency, markets, and profit, and their opportunity to control the context of their work via strategic and operational decisions is, as suggested in the preceding chapters, decidedly less frequent.

In the stories told by Matt, Robert, Chad, and Hui, Trevor and Trisha there exists strong support for the findings in Table 6.5 indicating over two-thirds of engineers design their day-to-day work “all or most of the time.” The interview data with the engineers also provides strong support for the findings in Figure 6.8 that suggest over two-thirds of engineers participate in organizational decision-making
at some level. This generally reflects the strong relationship between engineering and management, and the authority that is commonly delegated to even young engineers like Robert. Broken down, nearly 45 percent of engineers in the WALL survey reported being decision-makers (about a third make organizational decisions as part of a team and around a tenth make decisions on their own). The large proportion of engineers who plan their work and are involved in organizational decision-making, as noted above, stands in stark contrast to IT workers. While IT workers report similar levels of opportunity to plan their work “all or most of the time” (almost two-thirds), over half of IT workers report they have no voice in any organizational policy decisions. Just a quarter of IT workers are part of teams that make decisions about personnel, budgets, products, and so on, and only a tiny fraction report making decisions on their own. These finding on IT workers are supported by the data from my interviews, with participants providing important insights into how a lack of voice in organizational decisions impacts the environment in which they plan and perform their work.

Information Technology Workers

Both engineers and IT workers depend on a formal, codified body of knowledge that takes many years to master. There are principles, best practices, standards, knowledge sharing and so on. As described earlier, both occupations have been built around vibrant academic and research communities. As made evident above, and as I will show shortly, “organizational professionals” like engineers and IT workers largely share the same commitment to productivity and efficiency, and to the legitimacy of capitalism and market forces. There are major
differences, however, in: 1) occupational closure (“professionalization”) that is intimately linked to historical and fairly well-established norms; and 2) relationship with technology as an object and medium of labour.133

Engineers tend to work with and on technology and tend to need to be physically connected to the object(s) of their labour. IT workers also work on technology but, simultaneously, they also work through (information) technology that breaks down boundaries of time and space, and thus many don’t need to be in close proximity to the project they are working on. This relationship with information technology is, I will argue, a major hurdle inhibiting the process of occupational closure inherent to broader efforts to professionalize. This is a fundamental difference that limits the ability of IT workers to control their immediate work and engage in organizational decision-making, and to resist business process engineering that leads to the detailed division of labour, outsourcing, offshoring and, increasingly, downsourcing. For the IT workers in my study the key issues related to the global nature of the IT labour process, the rapidly changing knowledge base of the industry, and the rational, individualist outlook of most IT workers.

**Control and Organization in IT Work**

The information technology (IT) workers that I interviewed largely described satisfaction with their jobs, and levels of complexity in their work similar

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133 It should also be noted that IT workers in general tend to be younger and younger workers in general enjoy less discretion and involvement in organizational decision-making. My sample generally reflected this difference in ages, with the IT workers younger overall than the engineers (see Appendix F).
to that described by the engineers. All the IT workers tell of performing informal learning on the job in order to keep up-to-speed, with many doing self-directed work-related learning in their leisure time. They also tell of work environments where they have a fairly high degree of “responsible” autonomy. The IT workers report making decisions about their specific tasks but most also report having little voice over the full labour process to which their work contributes (or contributed). Quite frequently they described an inability to control or even provide input on the use of human and technical resources (i.e., little voice in strategic and operational decision-making), often leading them to develop workarounds and/or experience intense pressure to meet externally set deadlines (i.e., labour intensification). In the analysis below, the key theme I want to alert the reader to is the impact that lack of voice in organizational decisions has on the ability to control the specific context in which they are “responsibly” autonomous. It is the thread, so to speak, that connects the participants, stories, and subthemes, and one that contrasts in important ways with engineers.

In presenting material from my interviews with IT workers, I begin with two individuals—Vlad and Cynthia—who are employed in a large, multinational IT company with products and services that span nearly every field of IT. They don’t know each other, however, and are in offices separated by function and geography. I then present material from Henry who works at a large, national IT services consulting company. While he also works in heart of the IT industry, his field is client services and thus he bridges various “worlds” and is a broker and sales person as much as a “techie.” He helps set up the systems worked on and with by the other
three participants: Patricia, Rhonda and Anne. They all work in smaller organizations whose charter isn’t IT proper. Anne is the only respondent who works for a public-sector organization and the only respondent in a union.

**Vlad: Auto-Automation**

Vlad was a senior programmer in a large, multinational IT corporation. Middle aged, with a non-IT undergraduate education, Vlad taught himself various programming languages out of interest and then parlayed his abilities into a career. When we first spoke, he was a senior programmer in a multinational, multidivisional corporation where he wrote code by himself or with a small team. His main responsibility was building products for business clients’ internal information management systems, with expertise in the streamlining and automation of services. Vlad reported spending much of his working time at home in Toronto, part of the growing portion of workforce “telecommuting” (Huws, 2003), where he performed his programming tasks, engaged in self-directed learning using publicly available material and internal repositories, and participated in frequent conference calls. The only travel involved occasional internal, face-to-face departmental meetings and visits to clients to assess needs, study workflow, and develop proposals.

Vlad reports that over the course of his career he had “written himself out of a number of jobs,” by which he meant that he had automated the client’s workflow.

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134 I use past tense in discussing Vlad’s employment as he has left the company he worked for when I conducted his interviews.
in such a way that there was nothing left to do, and the software was highly stable and in need of no or minimal maintenance to be carried out by a junior programmer. This process was entirely natural to Vlad. The process of “writing” himself out of a job was also not problematic for his career, as his department simply moved him to the next project. In many ways, this capacity to find automating solutions was the foundation for his advance into a senior position. This is a mindset almost identical to Henry who reports that:

[automation is] inevitable, it’s a necessity. Things mature, it’s going to get to the point where it’s going to sustain itself, where it’s easy enough that everyone can use it and if you build something not like that you’ve built something that’s bad, right. The fact of the matter is that I’d rather move onto the next thing than stick around and fix somebody else’s bad work. If you build it in such a way that it takes six people to administer it, then it’s bad, but if you build something that two people can administer...I’d rather build something that I can just hand off to someone and just have it run and then I can move onto the next thing. I don’t want to sit around and baby-sit this thing if it breaks or requires all this maintenance.

In his work of applying rational principles to others’ work, or “business process engineering,” Vlad recognizes that the software he designs sometimes leads to people losing their jobs through outsourcing, offshoring, automation, or a combination of these. The jobs he automates are not just lower-level service or administration, but also accounting and, in many cases, IT. He is ambivalent about this outcome, seeing it as the progress in technology and largely inevitable. He recognizes, however, that it isn’t always pleasant when he must observe and sometime even work with people who he may be putting out of a job. He argues, though, that in many cases the tasks he is automating in the information management systems are not tasks necessarily done by one person, but routine activities part of many jobs that people may or may not want as part of their
responsibility. Vlad describes a recent situation where he went into a company where change of ownership and significant staff turnover had occurred. The new staff knew little about the existing system and his impression of their reaction was that, “Basically, they’re overworked and they’re happy that some of their work is taken off their plates.” Interestingly, Vlad refused to speculate in a general way on the percentage of organizations’ workforces that lost their job based on his software development, answering only that he didn’t know.

Between the first and second interview, Vlad’s employment situation changed significantly. With the global economic recession, the corporation he worked for, like many IT giants, began to lay-off thousands of employees in a purge that spanned its global operations. Numerous “rounds” of lay-offs left his department a fraction of its original size, and it was eventually disbanded. In what Vlad describes as “constructive dismissal,” he was moved into a less senior programming position in a department that serviced the products the company had sold to two major clients. Asked by management to look for ways to further “streamline the functioning” of his new department via the automating of support tasks, Vlad for the first time expressed qualms about applying his analytical skills.

135 The Ontario Ministry of Labour (2010) notes, based on the province’s Employment Standards Act, 2000, that: constructive dismissal may occur when an employer makes a significant change to a fundamental term or condition of an employee's employment without the employee's actual or implied consent. For example, an employee may be constructively dismissed if the employer makes changes to the employee's terms and conditions of employment that result in a significant reduction in salary or a significant change in such things as the employee's work location, hours of work, authority, or position. Constructive dismissal may also include situations where an employer harasses or abuses an employee, or an employer gives an employee an ultimatum to "quit or be fired" and the employee resigns in response.
He reports that he and the other senior developer that had been reassigned to the
department spoke privately: “We realized the applications we think of [sic] were
actually beyond anything our boss had envisioned for automating all these [internal]
jobs...We saw ways to write them all out.” Vlad and the other programmer realized
that this would very likely mean termination and not transfer of the less senior
programmers they worked with, and potentially the same for themselves, and so
agreed to keep their insights to themselves. Admittedly, there was a good deal of
self-interest mixed in with this altruism, but this example nonetheless suggests that
material conditions can have an impact on individuals who are otherwise
committed to free markets and formal rationality, a point relevant to not only IT
workers but all workers. In a final follow-up with Vlad, it turns out that indeed he
was eventually “packaged off” (given severance pay) for an amount that was “just
enough to make it not worth it to get lawyers involved.” He is now unemployed and
looking for a career change.

Vlad sees offshoring primarily as a tool for executives who focus on short-
term gains in profit (through reduced labour costs) to fulfill their goals and thus
collect their bonuses. Assessing the future of work in the IT sector, Vlad is
understandably pessimistic. Based on his experiences both prior to and following
his termination, he concludes: “IT work in Canada is very unstable. Basically,
anything that can be outsourced is being outsourced. Only the stuff that has to be
‘bolted down’ to the place is safe, everything else seems to be moving overseas.” In
doing so, however, the executives may be creating long-term problems in
organizational continuity and knowledge-retention. He described how a number of
his employer’s new foreign offices, recently created after layoffs in Canada, were staffed with IT workers who lacked specific experience with the clients and products they were responsible for. Staff in the new offices made a number of serious and expensive mistakes and the corporation immediately closed operations in that country and began to redistribute work to existing offices around the world. This additional work arrived before additional staffing could be added, creating a cascading effect of labour intensification and potential for further mistakes. Vlad reports that news of this event spread quickly across the company’s global workforce, leading to a transnational, internal network rife with rumours and low morale.

**Cynthia: Workers as the “Raw Resources” of IT**

Cynthia works for the same large, multinational IT corporation as Vlad, though they don’t know each other and work in separate offices. Cynthia has an undergraduate degree in computer science. Five years ago she moved from a smaller company to her current employer. Her role is to perform data administration and support servers that are used by research and development (R&D) programmers. Specific tasks include running diagnostics, trouble-shooting, providing advice on improvements. She works in a small group of eight people with a “lead” who functions as a manager.

The company supports a massive internal, digitized knowledge repository that Cynthia has access to. While she is expected to advance her knowledge, official support in the form of company-sponsored courses has declined and there is little emphasis in her performance reviews on acquiring further product-specific
credentials. Rapid technological change and ever-changing skills is the primary reason that she does not maintain her certification. For Cynthia, not only is it difficult to keep her certification current, once in her job such certification has become less important than organization-specific knowledge.

I guess I haven’t necessarily upgraded many [product-specific certifications] because it’s hard to maintain. Let’s put it this way, the nature of technical certification in IT is on a certain cycle and they can turn-over an operating system or certain products in 3 or 4 years, so for you to get the certification you have to do the vendor-provided courses which tend to be quite expensive and, depending on the situation you’re in, your department may or may not have the budget to send anyone. And then you have to pay for the exams.

Cynthia sees general analytical and business skills as fundamental to success in IT. In terms of the sorts of skills that are important for her work and for the employees she comes in contact with, she argues:

I think the difference between the technical person and one who is really good at their job [are] the soft skills: the way you think, the ability to realize what is needed and the ability to recognize patterns and what’s required and what you need to deliver whatever your service or your product is. Obviously, the ability to be self-motivated, persistent, and show patience goes a long way because a lot of time its frustrating, long, drawn-out projects...

Whether these “soft” skills should be considered “skills” or are more personal attributes that have been converted into skills in the knowledge-based economy is an important question (Warhurst, Grugulis, & Keep, 2004), and remains an open question in need of more research.

While she enjoys her work, and at times feels challenged, Cynthia is ambivalent about the power of many IT workers to control their working conditions. She proposes that “workers are the raw resources of IT,” central to the
production of informational goods but not necessarily making choices over how she, and they, are used.

Cynthia identifies size of department and/or organization as a key factor, contrasting her experience in both a large organization and a small one:

I find it’s hard to find a balance between being challenged and adapting and constantly learning things and to find a job that’s not too stressful where your focus is more on your job than anything else. I used to work for a smaller company and I would say I had a lot of opportunity to learn and more flexibility in the way I do things but then it was very stressful because I was working long hours. Sometimes when you’re working for a smaller company you don’t have the resources to do your job, you don’t have all the tools that a large organization can give the employees to do their job.

There appears in Cynthia’s analysis above recognition of a contradiction faced by many specialists, forcing them to choose more autonomy or less intense working conditions. A second issue emerges, however, in terms of involvement in operational decisions in a small organization versus a large one. When asked if she participated in organizational policy-making in a general way, or even just decisions that affected the budget, staffing, and projects of her department, she responded:

Those [decisions] are made at a very high level – because of the size of the organization, there are people solely involved in strategic direction and funds. I think there are avenues where you have some input you can report it up the chain, but...they encourage process improvement stuff to come forward. There is a certain aspect that says, “Ok, are you an innovator, are you trying to bring new ideas, how do you contribute over and above your defined tasks?” As far as your influence, someone in [a data] administrator role wouldn’t make a huge impact.

Cynthia has recently moved to a department that is slower paced than her previous one, but it has not changed the characteristics of her job that limit space and time for creative activity:

What do you need to be creative? You need to be relaxed, you need to have time to brainstorm and really think about things and really let things flow...
and in a corporate environment that's usually the opposite of what you have. There are always deadlines, people knocking on your door, just-in-time delivery, so it’s not conducive to that sort of process.

Cynthia is talking here about creativity as it relates short-term problem-solving as well as providing expert advice on strategic, conceptual work that may have long(er) timelines and involve major restructuring to improve efficiency within the organization.

For Cynthia, there is also little room for collaboration despite corporate statements strongly promoting such activity. Ideas flow out of the department through her manager and senior managers closely direct project-based interaction with employees from other departments. It leaves Cynthia feeling “compartmentalized” beneath layers of management.

We actually do use things like wikis that we use internally. It’s interesting, though, about cross-team collaboration, there’s a lot to be said for that approach but in a large corporation I’m not so sure how well it works, especially in such a large organization as [company name] where things traditionally have been very structured. Which is not to say that [company name] hasn’t tried to revamp their processes. I came from a smaller company and we got bought out by [company name] so I saw the other side where I’d interact with other teams and do a lot more different things on different levels than I do now where I feel like I’ve been compartmentalized, and maybe there’s less collaboration going on. I think because of the layers and the way things get put into boxes whether you like it or not, it’s hard to foster that environment of collaboration.

Cynthia’s account of her working environment indicates a bureaucratic structure where employee initiative and collaboration are discussed and knowledge-sharing tools are available, but divisional rigidity and centralized decision-making inhibit employees’ full application of their knowledge and problem-solving capabilities. Cynthia’s company, like an increasing number of companies, has begun to treat various divisions and departments as “cost centres” and for those in different
departments to treat each other as “clients.” How this new approach to internal relations between divisions and departments impacts on teamwork and collaboration is unclear and deserves more research.

_Henry: Working Around Silos_

Henry is a consultant in a leading Canadian company that provides IT business solutions. He has a postsecondary degree in computer science. Describing himself as an “integrator,” his is a client-oriented job where his primary function is to liaise between representatives in the client firm and various, frequently specialized departments in his company. Where Cynthia and Vlad offer a window into IT work not oriented to external clients, Henry works directly with clients, and takes the “lead” in coordinating projects. He is not, however, considered management, nor does he say he is interested in management.

Henry, like Cynthia and the engineer Robert, emphasizes the importance of combining technical and “soft” skills:

What I find is that sometimes I go to the client and they don’t know how to verbalize or explain what they need. What they appreciate is someone who can come in and quickly say “Ok, this is what you’re trying to tell me and this is what your environment is like and you want us to do this,” so they want me to go in and interpret what they need and communicate it and bundle it all up so that downstream the technical people that have to do the work understand what’s required. That’s a lot of what I do, is that, pushing that piece along, to be able to answer questions when someone comes back and asks “What does your client mean by...” then if you can tell them they’re grateful, and the client is grateful because they don’t have to say the same thing over again because they don’t know how to.

In the last chapter, I proposed that measures of training time (SVP) might lead to “false positives” where complex bureaucratic procedures and norms demand extensive initial job training even where task complexity remains low. Henry
problematizes this notion of false positives, pointing out that informal, sometimes tacit knowledge of formal bureaucratic structures is in many ways merged with his technical knowledge. Elaborating on his point above, Henry believes it takes:

...at least one and a half years to become competent at the job, to understand the technical skill part but then to understand the environment as well. I think you can always learn the technical skill side through whatever form of learning is comfortable for you, but if you don’t understand the architecture or the business of whatever it is you’re supporting then you can’t piece everything together. You can’t go solve a problem for a client if you don’t understand all the applications they are running and what they do and how they’re tied in. If you can know that and know that quickly, then you’re much more valuable than someone who has the certification.

Henry’s comments suggest that not only is initial technical training important among specialists, but that local knowledge is equally important and, in the delivery of services and client support, sometimes more important. Once in the job, there is evidence in his description of the necessity to solve problems and integrate new organizational and technical information quickly.

Henry’s claim of well over a year to become competent is similar to the majority of IT workers, and to many specialists in general as Figure 6.X shows. The specific, organizational and client knowledge that allows Henry to succeed in his job is shaped to a limited extent by the standardization of the consultation services and the processes and technologies he recommends. This standardization is focused mainly on project workflow, and occurs via mandated adherence to a set of guidelines published by an international IT consulting governing body that positions its products as a “resource library.” Most applicable to his work are (technology) change management processes that provide a framework for the steps he must follow, though he notes he must always customize the general framework to meet
client needs. Such standardization doesn’t bother Henry; he believes it provides important continuity between projects.\textsuperscript{136} What does bother him is his inability to effect change in his workplace despite his company’s purported desire for employees to take initiative and improve process.

While Henry describes a job that demands complex technical knowledge and substantial business acumen, at the same time he provides further evidence of the contradictory experiences of IT workers (and other specialists) vis-à-vis requirements for complex organizational and technical knowledge, on the one hand, and little ability to impact organizational change, on the other. He tells of a work environment where he frequently lacks the opportunity to apply the full range of his problem-solving and business process skills:

As soon as you try to go across the silos it doesn’t work, right, so I find that difficult. What I find, for the longest time, is that nothing gets changed no matter how hard we try and say, “This isn’t working.” I guess this is one of those decisions that is made at a high-level, in terms of reorganizing, and that is somewhat frustrating. The manager is ok with me having conversations across silos, trying to circumvent some of this, but the “t”s have to be crossed and the “i”s dotted at the end of the day. So I guess it’s everyone adapting to and working around something that doesn’t work.

Henry, not able to participate in operational and strategic decisions, makes creative use of networks and relationships. This allows him to function in the midst of the ossified structure of a supposedly cutting-edge IT firm. This is not, one would assume, what management strategists or knowledge-class theorists think about

\textsuperscript{136} Henry’s position on standardization is similar to the software developers who eventually came to appreciate standardized procedures in Adler’s study on “hacker idiocy” (2006a).
when discussing *creative* activities, but it is a consequence noted by those studying top-down management structures and technological change.

Henry describes how, within an organization where human and material resources are controlled centrally, contributing ideas can lead to job intensification. He contrasts involvement in voluntary creative activities with the ways creative contributions in the workplace can lead to additional hours and pressure:

> With open source, it's your choice. You put something out there and it works or maybe it doesn't work. But if you're at work and you contribute something it can backfire in the sense that now you have extra responsibilities and additional work and that becomes stressful. It might be great at the beginning but if not everyone pulls their weight it can become quite a burden. If this happens more than a few times, then people start to shy away from it. You need a critical mass of buy-in, and unless you have that it is doomed either to fail or it becomes a deterrent for the next time would think about contributing...you could literally have three or four people you're reporting to and x number of tasks for each of them. Now, if you contribute something and it comes back that now you've got more work now, you think [said sarcastically] “Great!”

Henry, lacking power to coordinate human and financial resources or to alter structural/strategic inefficiencies, suggests that he and many of his colleagues routinely withhold ideas for internal and external projects or initiatives. It may be going to far to call Henry's suppression of ideas “misbehavior” or “dissent” (Collinson & Ackroyd, 2005) but it seems fair to call it at least “passive resistance,” and it speaks to a dilemma that faces many in specialist occupations where ideas for problem-solving, organizational, design and products is the worker's primary goal. Participate fully and face additional workload, or withhold and potentially hurt oneself and one’s colleagues, particularly if the specialist plays a key role in a small department or as part of a project-based team (Huws, 2006).
From Henry’s experience, the lack of voice in organizational strategic and/or operational (re)structuring is due primarily to the sheer size of an organization, where responsiveness to new trends or integration with intensely creative technical subcultures are not easily integrated into complex, established labour processes. Referencing both internal collaboration and integration with external IT communities, Henry’s answer to a question on employees’ ability to effect change is this:

If you’re asking about collaboration, right, and cooperatives and the open source [movement], I don’t think large companies do that effectively. I think either it gets done informally based on the strength of conviction of a certain manager or group of people, or it becomes a project and mandated that people get brought together and then formally they work together.

Henry’s response is interesting in that it highlights what for him is a quite normal culture of workarounds and cooperation operating outside of the normal hierarchy. This practice of employees—often non-managerial—working together for the success of their department, division, and/or organization despite a lack of formal power, and sometime in spite of efforts of management, has been documented elsewhere (D. Collins, 1998; Hennessy & Sawchuk, 2003).

Within IT sector proper, dominant themes of routinization and automation, though two of three—Henry and Vlad—report high levels of control over their job. For all three in the IT-sector, however, a dominant theme was exclusion from organizational decisions that set the pace and choices available for IT workers to plan and perform their prescribed tasks. I now shift to examining the working lives of those who work with IT in non-IT sector organizations. Here, issues of
routinization and automation aren’t as prominent, but the issue of exclusion from organizational decisions is just as central.

**Patricia: Control at a Cost**

The industry, working conditions, and organizational size experienced by Vlad and Cynthia, and to an extent Henry, contrast with Patricia, who works for a hotel management company that oversees operations in many countries around the world. While the job was heavily technical, involving databases, the coordination of internal and customer websites, and hardware set-up, it also involved significant communication activity. Originally on the side of hotel operations, and with a university degree unrelated to IT, she fell into her IT job simply because she was excited about the technology:

A lot of the learning was self-directed. It was a situation where I was losing interest in what I was doing because I originally started off in sales and marketing. Usually in the hospitality industry the resources are quite sparse, we operate in a fairly lean environment, so anyone who showed interest in the department, the head of IT basically said, “Hey, we’re automating the sales office, do you want to help?” So I just learned a lot from people on the job who were willing to teach me.

Having recently moved into a more formal managerial role out of IT, Patricia looks back at her work with some mixed emotions, though on the whole she is positive. Because she was part of a two-person team initiating the development of a web-based sales-and-tracking “portal” to complement the existing hotel management system in use, she experienced high levels of autonomy and frequent “exposure” to senior management. In this way her work in IT was a springboard and she believes it a great field for anyone looking to build their career.
On the other hand, and leading to her ambivalence, she knows her ascent to project manager and substantial autonomy was partly the result of senior management’s refusal to provide adequate staffing. She explains:

Two people doing that job was insane, it really was. Even though we kept saying we need two more people we never got them and ultimately along the way I just got used to doing it but sort of saw the writing on the wall that this wasn’t ever going to change and things are just going to get worse and do I want to be doing this five years down the road.

Patricia notes that the person who filled her position left on stress leave and, while management made the final decisions on staffing, she feels partly responsible for this: “[S]ometimes when you say you need extra people or this isn’t going to get done and then you go and do the work anyway they don’t take you seriously. So I take responsibility for that, too. You [meaning herself] could have just not got the job done.”

When probed on the consequences of not getting “the job done” Patricia identifies two factors that drove her. The first motivation was the understanding that her future in the company depended on getting the job done on time:

[I]t’s more or less, “Well, this needs to get done and we need somebody to do it and if you’re not going to do it there’s the door.” I’m not saying anybody ever said it to me but it was implied. I think I would have had to leave rather than say I can’t work this many hours.

This implicit understanding was one key factor that led to Patricia working upwards of 80 hours for sustained periods of time. This pattern of long hours is common among those with specialized knowledge, who work the most hours out of all non-managerial occupational groups in Canada (Drolet & Morissette, 2002).

The other key factor was her manager who was unable to get approval to hire additional staff. Partly this was the nature of the corporate relationship, in that
the budget of the management company had to be approved by all the
independently owned hotels, but Patricia also felt it was partly her manager who
was not willing to challenge organizational norms:

She knew we needed the people and she’d have such guilt that she would
work from the Friday straight through to the Sunday to get it done. If the
person you’re directly doing this job for doesn’t support your need for people
and just says, “We’ll get this done at any cost,” then you’ve just completely
lost the fight and you’re like, “OK, [laughs] that’s over.”

Even though she “lost the fight” to influence operational decisions around staffing,
Patricia remains ambivalent and ultimately positive about the experience as a
whole:

On the worst weeks, I worked 70 to 80 hours per week, but that only lasted a
year. It would have been nice to get paid by the hour, but you get excited
about the project and think about, “Well, if I can pull this off…” it’s quite
exciting and it led to bigger and better things for me, so ultimately it paid off.

The contradiction here is important, and reflects an important issue for many
specialists: they often love the content of their jobs and the responsibility they have
even where they may not control the broader control over decision-making or
experience other negative outcomes. Such a contradiction is reflected in the
experiences of Rhonda, who like Patricia worked plentiful unpaid overtime but
loved the challenge of her work.

**Rhonda: A Self-Trained, IT department-of-one**

Rhonda was, until a recent car accident forced her on to disability
compensation, a database manager working in eastern Ontario for an American call-
centre company specializing in technical support. After four years providing
technical support directly to callers as a “floor agent” she moved into a lower-level
management position, despite only a high-school education. Her primary role in her
(then) new position was maintaining and accessing the company’s data warehouse that stored massive amounts of information on floor agents’ length of calls, number of calls, successful resolution, etc. This involved running thousands of reports everyday, though she never initiated any data analysis or performance reviews of floor agents: “My job was to run reports that were requested.”

Her advancement, and it must be recognized as advancement, was based on IT knowledge acquired through technical manuals and books on database technology but her learning was informal and not supported by the employer. Rhonda began by establishing a foundational knowledge of database types and languages:

[You had to learn SQL, just the basics of it. Once you learn any type of database work it’s all pretty similar. But some of the older databases we worked with you had to know SQL. Access [a different type of database] is user friendly, while SQL is a computer language and you have to know the language.]

Rhonda reports that, while the requirements to learn new bodies of technical skills was not strong, she had to learn new skills “every day” related to existing technology in order to draw data out of the warehouse in different ways, create new reports, and problem-solve new methods of data analysis when requests came from the head office located in the US:

Everyday was a learning process and there were days when things came easily and there were days when you felt like you were banging your head against a wall. Then you’d be talking to other reporting coordinators to try to figure it out how to do it…never boring, and it was very fast paced. There were many times I’d be working on a report on one computer, another report on my second computer, all while on a conference call.
Rhonda’s job was clearly challenging and technically complex, and deference was shown to her expertise. She describes below positive interaction with executives (though this occurred almost exclusively through video conference):

You had the respect of senior management. Senior management didn’t talk to you like you were a nothing and [say], “You do what I tell you.” They asked for your opinion and respected your opinion. They knew that you knew what you were talking about.

While the job was challenging and she felt respected, Rhonda recognized that her role was purely technical, and that the company felt she was easily replaceable:

If it was a report that I was asked for, even if it was one the client was asking for, if I knew that that there no way it could be done—whether because of the type of data or the format—it was my responsibility to say, “No, it can’t be done.” [I]t was my job to know the data warehouse to know what was possible and what wasn’t...there were internal and external reports. A report that was internal had to stay internal. If you sent an internal report to a client you’d be dismissed. So I dealt with internal reports but also reports for clients that would be sent to them electronically. I would get requests from clients and I would say, ‘Yes, the report is possible, it can be created.’ But then it would be up to my senior management and corporate department head to be on that call to get their approval to go ahead with that report. [italics added by author]

From this passage it is fairly clear that Rhonda was only nominally part of the management team. She was not asked nor expected to provide any advice, let alone make any decision, with regard to whether or not a report should be run based on legal issues, contractual issues, or any other factor related to broader strategic and operational matters. Rhonda was clear-eyed about her position: “I was considered management because I was a corporate employee, but I was as low as you could go...I didn’t manage anyone.”

The trade-off of greater status, autonomy and more interesting work for Rhonda, as with Patricia, was long hours. Rhonda was on-call 24 hours per day,
seven-days-a-week and was supplied with a pager and a laptop so she could be contacted to remotely solve the problems that (frequently) arose. When she began her quasi-managerial role, the data management system being used by her employer was prone to problems and she reports putting in massive amounts of unpaid overtime, often in the evening and at night, to ensure required reports were available for executives and/or clients the next morning. Just before Rhonda’s accident and subsequent departure on sick leave the company finally approved the purchase and implementation of a much more stable and user-friendly “data warehouse,” one she had researched and recommended. In the time Rhonda worked with the new data warehouse system the quality of her work drastically increased and her unpaid overtime decreased. Despite the one-strike-you-are-out threat and unpaid overtime, for Rhonda the job was still worth it because of the non-pecuniary benefits of job complexity and responsibility.

Rhonda was completely excluded from strategic and operational decision-making. In fact, many of the executives running the call-centre division felt excluded. In the two years before she left on disability, Rhonda’s company had been sold to a US parent corporation. She reports that the new owner was known for “flipping” companies. Her employer would buy a struggling company, drastically reduce expenditures (mainly through cutting of administrative and management employees), and then sell the company at a profit based on the ability to show the company was profitable. In short order the parent company did successfully sell the call-centre business employing Rhonda:

They only held onto us for a little over a year. Over that year they whittled down not only our department but other departments to the bare minimum
to make us...they just bought us to make money off of us on the short-term, to whittle us down to make us look profitable. After they sold us off they [the new company] began to increase staffing because they were finding that [the previous owner] had trimmed us just a little too much

Rhonda reported that the new, post-cost-cutting value was misleading and unsustainable. It led to serious job intensification for the administrative and management staff that was left, and that turnover was high. “We had been up to ten people but we were down to about three by the time I left. We were so over-worked at that point and so short staff...but they were likely going to hire them south of the border.” Within this context, she felt a bond had formed not only between herself and the other data management staff (spread across the country) but as well among herself, other data management staff, and the senior management team that also felt vulnerable. Based on informal discussions, Rhonda felt that she and the executives were on the same side against both the old and new parent companies.

**Anne: Autonomy within a public bureaucracy**

Anne worked in a five-person telecommunications/IT department for a major police force in Ontario. Anne is the only IT worker I spoke with who is or was in a union, part of the same union as “the sworn” (police officers). She is also the only IT worker I spoke with who was/is in the public sector. Anne had been in the IT and telecommunications department for nearly a decade, during which time the pace of technological change accelerated. The department had morphed from

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137 Like Vlad and Rhonda, Anne is not currently working. Not long before we spoke she was injured in an unspecified way and is receiving disability compensation, though she hopes to return to work shortly. I therefore talk about her work in the past tense.
providing just telecommunications support to analyzing and implementing sophisticated hardware and software for officers, who then had to be trained to use the new IT. The range of products grew again as mobile technology proliferated and was integrated into officers’ daily routines. Her job focused on communicating with officers to understand their changing needs, but also to educate them on how to use new and existing mobile IT, and to recommend the adoption of new technology. This in turn prompted ongoing, necessary and mostly self-directed learning by Anne, building upon her formal telecommunication-focused education at an Ontario college.

Anne described a positive working environment where she felt challenged, was delegated significant responsibility, and enjoyed frequent opportunities for interaction with both police and other admin and technical staff. She reports that she worked fairly “regular” hours and that deadlines to complete projects were realistic, often set by members in the department. She did note, however, that her manager was oriented to her own career advancement and was often autocratic about the sorts of projects that were initiated.

She [the manager] was trying to build up her own little empire there...I found that hard and my job harder because I was putting in more hours trying to accommodate what she wanted and what the police needed.

Anne felt that her ability to alter the situation was inhibited for both organizational and personal reasons. The rigid hierarchical structure of the administrative support functions of the organization combined with her manager’s personal failings, particularly the manager’s supposed telecommuting (Anne suggested the manager was often just not working and depending on her staff to pick up the slack). This
inability to control her workload became more intense as the force adopted more and newer information technology:

I feel the management should have been more hands on in terms of knowing what the requirements of the job were and what to expect and not to expect...and our manager who we had to go through and could not go higher then, was not there a lot because she liked to work from home. It put a kind of spin on things because there wasn't an open door policy as far as I was concerned.

Yet, in spite of these complaints, and like nearly all the IT workers I spoke with, Anne was unequivocal in describing how much she enjoyed her work. As long as a project fit with the “manager’s vision,” Anne was free to “run with ideas and implement changes.” As Anne described, “If a project was given to me I had full range on how I was going to go about it. That was great.”

Within this environment, all five employees in the department had the opportunity to lead projects. For Anne, this meant that she could seek out and consult with whomever she chose in order to see a project to successful completion. Anne notes that part of the staff freedom came from being in a small department, part of it from her manager’s frequent absence (noted above), and that the core team was generally happy with the arrangement that offered them greater autonomy and operational decision-making opportunity.

Open Knowledge and Organizational Authority: The Challenge for IT Workers

The stories IT workers told about their jobs suggest two broad conclusions. First, job complexity remains high and routinization and job fragmentation are currently not penetrating IT workers’ jobs to any great extent, with perhaps the exception of Cynthia. Two, and in spite of the first point, specialized knowledge does
not function in the same way capital functions; IT workers don’t control the “means of production” in such a way that they are gaining significant power within the broader organizational decisions that directly shape the context of their work (e.g., budget, personnel, time-lines, organizational structure). IT workers’ knowledge is valuable to any company that uses IT, but management has retained control over the labour process as a whole. The engineers I spoke with described levels of specific job complexity similar to IT workers but simultaneously nearly all the engineers reported far more involvement in organizational decisions. This finding is supported by findings from the surveys in Chapter Six. As I argued at the beginning of this chapter, both occupational groups are “engineers” if engineering is understood broadly as the application of scientific, mathematical and other esoteric knowledge to the development and improvement of technology, processes, and organization. The core difference is that one group lacks any sort of occupational closure while the other has gone some distance toward professionalization, including legislation that dictates a set of core activities that only they can plan and implement. While this may change in time, in the rest of this chapter, especially the last section, I present evidence why I do not think that IT workers will achieve even partial closure.

To say that engineers have more power over the context of their work than IT workers because the former are professionalized is obviously tautological and even banal to those who critically study work, organization, professions, and so on. But in the context of theories of a new creative class (and dated but more popular theories of a knowledge class), where knowledge is proposed as the means of
production and functions as an equivalent or even replacement to capital, the point still needs to be made. Specialized knowledge is only a means to power in the labour market and in relations of control as long as it is *scarce*, whether the knowledge is experiential, context-specific, general and synthetic, or extremely complex abstract knowledge in a technical field. Once codified and formalized, any knowledge can be shared infinitely and will only remain special as long as it can be effectively protected. This was the thrust of guilds through history and continues in a “professional” form today, endowing current possessor(s) with broad organizational power only where: it is connected to professional closure (including control over access to learning, entry to the profession, and right to practice through certification); it is linked to some sort of costly credential (like an MBA); or accessible only through extremely costly and tightly controlled technology (like researchers on genetic sequencing or particle acceleration).

IT-specific knowledge, while widely available, is highly technical and has been—and for the most part continues to be—scarce relative to the explosion in digital products and associated commodity development and service delivery. Lacking are well-developed rules or procedures of practice external to the organizations IT workers are embedded in (e.g., acts or other legislation governing activities or designations related to IT work), and thus IT workers’ power appears to be localized to their specific job, and their power entirely dependent on the delegation of authority by management and/or individual negotiation. In fact, it remains unclear to what extent IT workers’ control over their day-to-day tasks reflects power and to what extent their control is created by the problem-solving
and design activities inherent to their work. There are, without doubt, “elites” within IT (as within all specialist occupational groups) who have immense power based on real or perceived “scarce” gifts. I am concerned less with these outliers, at this point in my analysis, and more with the general trajectory of IT work.

It is possible that the pace of technological change, continued expansion of IT into everyday life, and other industrial trends will make those who possess IT-related knowledge scarce and will function as an informal tool to effect “protection” of IT jobs. In this scenario IT workers will be able to parlay this scarcity into continued or even more control over their jobs while gaining greater participation in organizational decision-making (over half currently report no participation at all and just 26 percent make decisions as part of a team or on their own). In other words, maybe they will become more like engineers, of whom only 30 percent or so report no involvement in organizational decision-making and around 45 percent report making decisions themselves or as part of a team.

Alternatively, IT workers may choose to pursue traditional methods of professional closure at provincial, national or even international levels. One version of this might be an association or union that attempts to bargain collectively. Another, stronger version would entail convincing legislators to create an act that established self-governance, the need for a credential to practice, and/or strict delimitation of activities that must be performed by a credentialed IT worker. It might even include oversight and review of IT educational programs. IT workers might pursue both avenues simultaneously, achieving professional status and bargaining rights akin to doctors. What is the potential for any of these scenarios (a
growth in power based on informal closure or professionalization)? The material I
gathered from the interviews with IT workers and present below suggests neither
scenario is likely, and the reasons neither is likely have been unfolding and growing
for some time. What the material does suggest is a variety of significantly different
(potential) paths for IT workers.

Maturing Technology, Rapid Change and Distributed Work Flow: The
Challenge for IT Workers

Information technology (IT) has changed dramatically in a relatively short
period of time, giving rise to a range of claims of an IT “revolution.” Putting aside the
subjective and rather unimportant argument over whether or not the increasing
sophistication and power of IT qualifies as a “revolution,” I want to focus in the
following sections on the logic driving this rapid maturation and proliferation of
uses, how the specific work of those developing and using new software is changing,
and how the work of IT workers might change in the near future. The IT industry
often looks chaotic to an outsider, with new operating systems and applications
appearing frequently, and particularly with the recent emergence of smart phones
and mobile devices. There can be no doubt that the pace of change in the IT sector is
significant, and the sector is extremely competitive.

Yet, simultaneously, IT is maturing quite rapidly and many activities within
hitherto complex processes—to date defying algorithmic solutions and thus
demanding IT specialists’ judgment—are increasingly well understood, predictable,
and therefore subject to standardization. This is a key point as the labour process of
most IT workers is conducted through and within IT itself. Much of their work is in
digital form and therefore highly mobile via local area networks (LANs) and wide
area networks (WANs), the biggest of the latter being the World Wide Web. While the outsourcing and offshoring described by participants is well known, they also describe how standardization and modularity in products is threatening IT jobs so far immune to routinization.

**Maturation, Productive Capacity, and the Redistribution of Work in the IT Sector**

Cynthia describes this process of technological maturation, and how this maturation is both driven by and complementary to the assortment of strategies used by management to decrease the demand for labour while increasing productivity (e.g., automation, centralization, routinization). Cynthia draws a parallel to the shift within manufacturing that led to Fordist assembly-line production:

In a way it’s almost like, to draw a parallel, to making cards, to making cards before factories, before it became very production line, you required more workers, you were less efficient, [and] you couldn’t pump out your product. But now, in IT, because of automation and the technologies out there that allow access to the Internet, everything is getting more stable and easier to use that in a way it’s more to code, it’s not proprietary and it’s very modular...

Henry makes a similar point, explaining that the maturation has resulted in the ability to make software products standardized yet still customizable: “In a way you could say that you are assembling individual things and put together your final product rather than doing everything from scratch.”

Such standardization and the increasing predictability it brings allow many IT firms to centralize management over geographically distributed workflows. Outsourcing has also long been a favourite “business process reengineering” strategy in the North American IT sector, allowing companies to remain much more
flexible, keep wages low(er), and be less responsible for costs like health care and pensions. With the ongoing maturation of workflow software and rapidly expanding connective capacity (i.e., bandwidth), it is possible for more and more programming, support and database management tasks to be moved to national and international subcontractors (J.R. Baldwin & Gu, 2008). The IT workers I interviewed were, in general, resigned to the outsourcing and offshoring going on around them.

Cynthia has experienced offshoring personally (“I've already been there”) as her previous position in server support was moved, along with the entire department, to India. In her current role:

[W]e have people from India that we work with, that we give some tasks to that were maybe previously in that group. I think there’s a lot more potential in the industry and in my company that more and more things might be moved off to other countries because of the constant drive for profit margins. How do you give your stockholders value for their money, how do you keep on making profit with so much competition....[unclear]. That’s a major factor in whether companies are profitable or not, especially in IT because that’s what the products require. It’s all about the manpower, the people, the staff, that’s their main – their raw – resources if you like. It’s not like manufacturing and the cost of steel.

Henry believes that business clients are growing less and less reliant on IT expertise, with non-IT staff increasingly comfortable working with computers and other digital technology:

The business users in the companies have the knowledge, they do understand the technology better, and they don’t have to deal with someone face-to-face. They’re more than comfortable dealing with someone over the phone or the Internet. The technology is such that someone from India or China can remote access any machine and fix your problem for you, all the technologies are there. If you have a problem with your machine and something is unrecoverable, I can get into your machine and within x number of hours you’re set to go again. With standardization of what people are looking at on the screen – you get x, y and z and that’s it, no personal crap on it—it’s very easy to support.
Henry connects this process to a decline in demand for certain technical skills:

[I]t's happening already. A decline in certain IT skill, especially IT administration type jobs, I think is going to slowly decline. They're definitely moving offshore already. And not only in terms of moving offshore but worldwide they're going to start to decline.

Henry provides an example to illustrate his point about the impact of growing stability and improving usability of IT, and the likelihood that these trends will reduce demand for IT experts:

A lot of software companies are selling you a base product and then you can buy additional components and integration into your system is a lot easier, a lot less customization. I think there's a level of skill, of IT skill, that companies will realize “We don't need people to do this.” Those skills are going to go away, and I think they're going to fall to the business user's hands. So a lot of system-account administration and that type of thing. So if there's Mary and she's sending HR information anyway she might as well create user accounts. [But] she only has limited access to things so she can do that now.

Henry's discussion immediately above and the material earlier seem to make clear that business process reengineering has been decidedly successful in figuring out ways for companies to find cheaper sources of overseas labour, and to shed jobs through the development of work-flow software that applies algorithms that replicate (often routine) human labour.

Cynthia describes how quickly the IT labour market could change if routinization, automation and/or offshoring continue to undercut demand:

Wages have already started to decline. There was a peak right before Y2K,\textsuperscript{138} right, just because there was this incredible demand and this big gloom and

\textsuperscript{138} The “Year 2000 problem” (Y2K), or the “millennium bug,” was the concern that, because many computers’ systems used only a two numeral system for the calendar year, “2000” would confuse computers and cause innumerable glitches and/or failures across the world. Preparation and fixes for this
doom, right, and there wasn’t the saturation of skilled workers back then. It was a time when people could get incredible amounts of money without a lot of experience just because they had some technical training.

The data presented earlier in Chapter Three suggest, however, that occupational growth in IT remains strong. Yet such an occupational trend is not incompatible with outsourcing, at least in the short-term. Outsourcing, if jobs were retained in Canada, would have no net change on the number of IT workers, though one would expect average earnings to fall. Also, growth in the IT sector overall may simply be faster than decline in demand for IT workers caused by automation, outsourcing and/or offshoring.

The issue here is the supply and demand of IT workers, and how organization’s ability to redistribute work over great distances impacts on the nature of work and power for the remaining IT workers in Canada. To summarize briefly the evidence presented so far, many Canadian IT workers are employed in organizations that are bureaucratic in structure. Using Frenkel et al.’s terminology, the IT workers’ jobs are fairly well defined, technically complex, and offer the chance to control decisions about how their work is performed. While departmental and divisional boundaries are fairly stable, most report having opportunity to see most projects through to completion. Organizations employing IT workers in my study were hierarchical and decision-making appears to be centralized, however. In contrast to the findings that they mostly enjoyed discretionary power over their

now infamous non-problem ran into the billions of dollars globally in combined public and private spending (International Y2K Cooperation Center, 2010).
jobs, IT participants argued that the confluence of technological possibility and pressure to cut costs is making more and more jobs susceptible to routinization via technical standardization. Others may see their jobs outsourced or offshored as management’s ability to understand and coordinate the complex process of hard- and software development continues to grow, as made evident by Vlad’s story.

Yet some IT jobs can’t be outsourced or offshored; they take local knowledge and, often, physical proximity to effectively perform the job. Henry’s job where he meets with clients, and which combines sales and product development and customization, is one of these. Another is Anne’s job for a police force in Ontario. Asked if she was worried about outsourcing, she replied, “Absolutely not. It’s personal, some of it is covert, there is absolutely no way it could be contracted out unless the role was changed.” Yet, even where an IT job demands proximity to users and/or management, and can’t be offshored, organizations are finding ways to reduce labour costs in ways that threaten many sub-occupations within the IT sector. The phenomenon I’m referring to is different than IT jobs being transferred to another less-well paid IT worker, or where fragments of an IT job are distributed to workers who need little or very specific IT knowledge to complete their task (and who may still be, nominally, IT workers). This is the issue of an entire job demanding specialized knowledge (or parts of the job that still nonetheless require specialized knowledge) being taken over by someone with no formal training or designation within a given occupation.
Downsourcing: Super-users and the end of the “Big, Fat IT Thing”

The process of maturation for IT technology hasn’t just been about scalability, modularity, and the ability of management to understand and centralize control the labour process. The maturation has also resulted in a change in supplier-client relations as more client companies seek IT solutions that are shaped to their need(s) and business structure and less shaped by the internal need(s), technical priorities, and internal, proprietary solutions of large IT companies. Cynthia explains how this maturation is impacting IT business services:

[In] practical terms, in business terms, there are so many competitors now as everything proliferated now everybody is dependent on it, if you have three companies and one offers a product that is easy to use, saves a lot of time, saves your employees’ time, and you have these other ones, which one are going to go with in the end, right? I think IT eventually evolved to fit the business instead of the other way around where IT’s beginnings were almost the opposite: “Here’s what we can do, here’s what we can offer you but in the end you have to change some of your business processes to work with the technology.” Now, because it’s so widespread and everyone is using it across the world and they know it can be done, it’s just a matter of demand for better products that are easier to maintain and use and won’t require the original company to fix and maintain and support.

Henry, who works directly with clients in providing IT solutions, touches on the same issues, but goes further to suggest that the demands by clients aren’t just changing the types of products sought but may in fact seriously diminish a variety of services and support functions that have been lucrative subsectors in the IT industry:

[B]usinesses are growing so fast they’re demanding things don’t work like they use to do. They shouldn’t have to fit their business processes to fit IT requirements. “You build the thing to fit how we work,” and that’s what everyone is pushing at, that’s what people are asking for. People are meeting that need and as more of that happens the big, fat IT thing is going to get stripped out.
By “big, fat IT thing” Henry is suggesting that client companies want IT tools designed to be accessible for the client’s employees to use, modify, fix and build on. This is different from making the product easy to use or “simplifying” the underlying design. Henry explains that proprietary products are losing ground to collective, open source products that can be learned, accessed and maintained more easily because of their standardized structure and coding:

[T]hat’s the point of open source, it empowers the end-user. Not so good for the companies where this used to be their bread and butter. [Major, US based IT services corporation] is being challenged to reinvent themselves: “What can I offer, what is going to be my product when so much of the stuff out there is freely available?” There are lots of people out there who can just teach themselves programming, who can develop something that is constantly updated and improved, it’s just really hard to beat that. How do you add value?

What happens when the organizational “end-user” realizes that they can save money and have greater control by having internal, non-IT staff perform the tasks and support they are or were paying to IT service and support providers?

The continued need for local employees has led, my data suggests, to organizations seeking ways to find capable but low-wage employees to fulfill IT-related functions. That is, entire jobs are being reassigned from specialized IT labour to non-specialized labour. This I call “downsourcing.” This term is relatively new and consensus on a definition does not exist. Clay Shirky, in his book *Here Comes Everybody: The Power of Organizing Without Organizations* (Shirky, 2009), uses downsourcing to identify the situation where the activities performed by a specialist become more widely practiced. One can think of the skill of typing, which was the domain of specialized typists until the personal computer led to a diffusion of the ability and the end of that occupation. Shirky predicts that software
programming will follow the same trajectory and become a widely practiced activity by people who won’t necessarily think of themselves as “programmers.”

My definition is more political, and oriented to my analysis of class. I use downsourcing in the way similar to Burk and McGowan’s (2010) use in their analysis of occupational trends within large but increasingly “brittle” law firms. They define downsourcing as the shift of (often routine) tasks within a lawsuit from full-cost associates to lower priced contract lawyers and non-lawyer specialists:

Large law firms can conduct document and information processing with an atomized ad hoc team of personnel scattered throughout multiple branch offices, each individual contributing from a computer in his or her office (or home) via the firm’s intranet or the Internet. Whether to offer a price advantage or at the insistence of the client, such projects are also more and more subject to what we call “downsourcing”—that is, being staffed less by high-priced associates, and more by pushing the work “down” to lower-cost (and lower-rate) non-partnership-track staff attorneys and non-attorney staff, or a flexibly available corps of contract lawyers and staff who either deal directly with the firm or are supplied to the firm by temp agencies on a per-project basis. (p. 60)

The concept has also manifested itself in discussions of employment in higher education, where the increasing reliance on sessionals (generally called adjuncts or “part-time lecturers” in the US), who may hold doctorates or be doctoral students, to teach university courses is increasingly common (Finder, 2007). These sessionals do the same work but often much less money and no benefits, though unionization among sessionals is beginning to achieve better conditions and some benefits.

In the context of IT work, there are two examples of downsourcing. The first is Patricia, who worked in IT at the central office of an international hotel management company. She alludes to the phenomenon of downsourcing when
describing what she calls “super users,” employees in non-technical, often low-level service-oriented positions who had an interest in computers and other IT fields:

Sometimes within each department you get a “super user,” much like me 20 years ago who went, “Ohhh, this is cool and I want to take on more of this.” [Property managers are] responsible for every system and they try to find a super user in each department because there are other systems – we have finance systems and an accounting system but then the property management system they do try to find one person in each department that they can kind of allocate as a “super user” – again, informal, again, no incentive. Some people just...for example, there was someone in food and beverage who was just so amazing, they took it on and created a standard company wide. It wasn’t his job, but it was part of what he did. There are a lot of people like that who are willing to take that on.

With no additional pay or formal role/title change, Patricia acknowledges that sometimes a willing super user didn’t materialize and the most competent hotel staff had to be “volunteered.” But even then, Patricia felt this was for the employee’s own good as it gave them exposure to managers and management, and the opportunity to prove themselves as part of a large project.

In a way, Rhonda, the database manager working in eastern Ontario for an American call centre company specializing in technical support, is a direct example of such a “super-user,” and downsourcing more generally. As noted earlier, Rhonda began as a floor agent in the call centre, providing user-support for a variety of consumer software and hardware products. While happy to have the new quasi-managerial job she did, Rhonda was not naïve to the economic forces that had brought the company to her town and likely had allowed her to move into a managerial role. Just as in the hotel company employing Patricia, so-called super-users are a cheap way to fill roles demanding specialized, and could be asked/forced to work extremely long hours and take on managerial- and specialist-like...
responsibilities for relatively low wages. Rhonda, on call 24 hours a day and seven
days a week, makes clear just how cheaply her company was getting her specialized
knowledge, and the reserve of potential super-users developing in “floor agent”
positions:

   In my department, for the longest time the other gentlemen and myself were
by far the lowest paid. When I left I was only making $13 per hour [only $1
more per hour than she made as a floor agent] and we were just going to
salary. It would have been around the same, though, and it was normal in our
company. They knew they could get Canadian people cheaper than US
people...They tended to go to areas like [Rhonda lists non-metropolitan areas
where the company ran call centres]. The reason they were chosen was they
have high unemployment rates so that meant a cheaper workforce and the
unemployed workforce was very technical. There were lots of people who
had taken courses in dealing with computers and that sort of technology...It's
amazing how many people have education from [the town’s college] and are
unemployed. So that's a big draw factor for that sort of call centre.

Rhonda asserts that it was common knowledge that the company, to ensure
geographical flexibility in the event of an economic slowdown and/or unionization
efforts, used the leverage of providing jobs in these high unemployment areas to
demand (and receive) short-term leases for the publicly owned buildings the call
centres were housed in.

   Anne can also be considered a “super-user” in many ways. Her education
included postsecondary studies in the paralegal field at an Ontario college. After
finishing her schooling she worked a variety of jobs before being hired by a
communications company where on-the-job learning provided her with marketable
knowledge on telecommunications. She was “headhunted” by the police department
where she worked in “telecommunication support.” This involved basic support for
pagers and cell phones. Over time, however, and with the rapid influx of new
technology, her job morphed into an analytical position, though neither her title nor
her pay changed. The change in her job meant that she had the opportunity, and had to learn how, to perform programming and other technical tasks related to internal communication systems. Suggestive of Shirky’s argument, above, that programming will soon be practiced by many workers, and no longer a specific occupation, Anne’s programming knowledge was gained via self-direct and experiential learning. Some organization-sponsored training was available but the onus was on the employee to prove the training was directly relevant.

How pervasive are the phenomena of “super-users” and downsourcing (as I define it)? It is a difficult question to answer. Among the engineers I spoke with Trisha, who led other engineers at an Alberta-based pipe-manufacturing company supplying the oil and gas industry, is an example of an untrained employee performing engineering duties. Matt was the manager in charge of safety and quality assurance at an auto-parts manufacturer in Ontario. His staff was made up of some formally trained engineers but most were not, nor did they need to be. These “techs” did, however, perform a range of testing tasks largely indistinguishable from what engineers do in Matt’s and other organizations, and enjoyed a level of autonomy in their work and collegiality with Matt reminiscent of conditions described by the full “engineers” I spoke with. The techs working for Matt were not, however, paid like engineers.

Some of the quantitative data hints that the phenomenon of downsourcing might be more widespread than the newness of the concept suggests. For example, the data on discretion suggesting that opportunities for non-specialists, non-managerial employees to plan their or other’s work has increased substantially from
Only around a third of service workers in 1983 report designing their or other’s work “all or most of the time.” This rose to almost half by 2004. The pattern is similar for industrial employees, with just over 40 percent designing work in 1983 but nearly 60 percent in 2004. The extent to which this change is due to the downsourcing of entire specialist jobs to non-specialists is, admittedly, impossible to know from this measure. Yet the evidence presented above suggests that downsourcing must at least be considered when looking for causes, alongside the more general socialization of the labour process where service and/or industrial workers are drawn into more complex labour processes with or without specialists.

Another suggestive proxy is a measure derived from a combination of survey respondents’ self-identified occupational status (manager, supervisor, non-supervisor/manager) and a follow up question that asked if the person had managerial or supervisory responsibilities. This distinction is important, as we saw with Rhonda, with Chad (who held a managerial title but didn’t actually have anyone in his engineering firm reporting to him), and with many of the IT workers I spoke with who reported taking on small-scale and sometimes temporary managerial roles in their department or on inter-departmental teams. In the findings below it is impossible to separate out the processes of downsourcing, which according to my usage involves moving entire specialized or managerial jobs to non-managerial/non-specialized workers, from “delayering,” which I identify as the delegation of limited managerial duties to non-managerial employees.

Despite this limitation, the findings in Table 7.1 indicate a trend toward engagement in managerial and supervisory functions among those not officially in
such roles. Specialists have remained fairly constant while opportunities for service and industrial workers to coordinate and supervise the work of others have expanded, leaving the two groups much more similar. Industrial workers have gained the most opportunity, likely due to the growth in Total Quality Management and similar strategies that seek to engage workers’ critical faculties and enhance motivation through the use of teams, job rotation, worker empowerment, and other measures designed to give workers great operational control. The drop in managerial and supervisory responsibilities among those who identified themselves as managers and supervisors presents the possibility that coordination and supervision are a zero-sum activity—more for some means less for others. Yet data showing that involvement in organizational decisions is rising for all workers, including managers and specialists, challenges such an interpretation. The finding of dropping involvement among managers and supervisors could also be the result of downsourcing (as in the title-inflation case of Rhonda who was classified as a manager but by her own acknowledgement didn’t manage anyone). Most likely, the drop is a combination.
Certainly, the trends observed in Table 7.1 demand further investigation, and would benefit from more detailed studies of workers in Canada to evaluate the extent to which their increased participation in managerial and supervisory activity is merely a superficial strategy to gain their assent to restructuring and business process engineering policies that are decided at a more senior level, or if they are taking on more complex managerial roles but with no change in job title. The data in Figure 6.6 on organizational decision-making suggests there has been a growth in involvement, though around 60 percent of both service and industrial workers still have no opportunity for participation.

Another relevant if indirect proxy for understanding the potential of downsourcing to erode the power of specialized occupations was presented earlier. Table 6.1 presented data on respondents’ educational attainment, if a post-secondary credential was required for entry/performance of their job, and various
measures of underemployment (educational attainment exceeds educational requirements). The findings suggested that managers and supervisors are far more (formally) educated than in the past but that requirements have actually decreased, leading to substantial increases in underemployment in both groups. Specialists have hardly changed and, as noted earlier in Table 6.1, are decidedly homogenous in their levels of underemployment that is around 20 percent. Industrial workers’ educational attainment and requirements have both increased at about the same pace, with underemployment remaining just over 30 percent. Educational attainment among service workers has increased the most rapidly out of all broad occupational groups, more than tripling since 1983. Among service employees, however, formal educational requirements just doubled, leading to a jump in underemployment from around a quarter in 1983 to around a third in 2004 (both underemployment based on “credential required” and underemployment based on “education actually needed to perform job” were around a third).

The point I want to emphasize here is that growing numbers of the “working class,” often erroneously described as “unskilled,” possess tertiary education and/or have gained knowledge in specialized and managerial fields through both experiential and informal learning. As well, the data above suggests many of these non-specialist, non-managerial workers are engaging in managerial activities. This suggests a largely untapped capacity that could be accessed by employers looking to reduce labour costs by downsourcing. The privilege gained by the possession of scarce knowledge (specialist or managerial) is threatened in this way, and is further threatened by the increasing socialization of technical and other knowledge via the
Web. Free and low-cost digital repositories, technical blogs, and online tutorials are complemented by energetic and passionate individuals who continue to amass knowledge in wikis and provide code and coding knowledge through the open source movement and Copyleft protocols. People in all occupational groups report extensive informal learning; these new initiatives add relatively cheap synchronous and asynchronous access to a global community of experts and learners, providing new opportunities beyond the localized learning that occurs through social interaction at work and in their private lives (for Canadian data, see Livingstone, 2010; Livingstone & Sawchuk, 2004; Livingstone & Scholtz, 2006).

The findings on educational attainment and subjective underemployment suggest that a great number of service and industrial workers are capable of and, I infer, desire more challenging work. It is worth emphasizing this point: downsourcing isn’t only a top-down, structural change initiated by organizations looking to reduce costs paid to specialists (or the professional services organizations that employ such specialists). It is this, but it is also an active strategy by non-specialist workers (like Patricia and Rhonda) seeking more challenging, responsible work. Yet the downward trend in opportunities to design work among specialists suggest there may be “discretionary ceiling” created by continued adherence to bureaucratic structures and centralized control of labour processes. This is, again, a question demanding further research.

The phenomenon of downsourcing has direct implications for supervisors, lower- and mid-level managers, and specialists, particularly those like IT workers who have not achieved recognized professionalized powers to control entry to the
occupation. Throughout the interview data presented in this chapter there is
evidence both of engineers’ recognition of and security in their ability to resist
downsourcing (and outsourcing) and IT workers’ recognition that they face a range
of challenges in resisting such changes. In particular, IT workers were generally
fatalistic about the potential for professionalization and collective bargaining that
might protect their jobs from outsourcing, offshoring and downsourcing.

**Potential for Professionalization and/or Collective Bargaining Among
IT Workers**

It was difficult to get the IT workers I spoke with thinking about
professionalization and collective bargaining. When they did engage with the issue,
their struggle to see how it would be relevant to their work was telling. In the
interview excerpt below, Cynthia’s struggle to identify what constitutes a
“professional” reflects the liminal character of IT work and other specialist
occupations that might be described as “semi” professional. On the topic of IT
workers’ being, or not being, professionals, Cynthia takes a position that is strikingly
similar to Evetts (2003, 2006) who argues that formal distinctions between
“professionals” and other occupations is one of “degree rather than kind” (p. 134).
Cynthia reflects:

I’m not sure if you have a distinguishing feature between a white-collar
worker and a professional. Maybe you have a code of ethics and you’re held
to that code of ethics. I think, for example, engineers – that’s how they
distinguish themselves. They have a formal designation and a code and they
can be held responsible. Now, in IT, there’s that missing component of the
code of ethics and to be considered a true professional there has to be that
code of ethics. I won’t say that IT workers don’t practice a code of ethics
informally but there’s no formal code of ethics that people that we work with
ascribe to, other than the corporation that they work for. There are other
elements of being a professional, like a higher level of education, but in some
ways there’s a mixture of that too because then you have people who have
post-secondary education but not in computer science, others who just have college, and others who didn’t even do college but who might have done technical courses. There’s a very wide range of education level in our industry, and the higher education you have doesn’t necessarily mean the higher up you’ll be.

Cynthia’s assessment of IT workers suggests something more akin to Derber’s “organizational professionals” (1990) than to classic professionals, less committed to the public good than to the needs of their employer. Such an orientation is also suggested in Brint’s proposal (1994) of a shift in orientation among many highly educated specialists from “social trustee” to (potentially self-serving) “expert professionalism.”

When probed about the potential of, or even desire for, a more professional, collegial decision-making environment where IT workers had greater voice in organizational decisions, Cynthia was highly skeptical:

[W]hat you’re talking about is almost where the employees have power over decisions and everyone got together and talked about things like letting workers go even if we don’t get x amount of pay increases every year. I don’t think people in our industry have that mindset, first of all, and I don’t think it would work.

Why wouldn’t it “work” for IT workers? As Cynthia argued earlier, large IT organizations have taken on more and more assembly line features of industrial manufacturing. It is a theme she returned to repeatedly, and fuels her justification for claiming collegial decision-making environments like the one described by Robert wouldn’t work:

I think it’s more like, and there’s lots of people who make jokes about this, that we’re just cogs in the machine and at the end of the day we’re just like serial numbers in the big corporation.
It isn’t that IT workers aren’t smart, rather Cynthia implies that the organization of work in the corporation she works for, and other multinationals, is such that employees don’t know what’s happening generally, even if they largely control their specific work, and that coordinating functions are neither desired nor possible in a bureaucratized organization.

Henry also experienced difficulty in articulating what professionalism meant to him, and what it might mean to IT workers. At times he mused that professional designation should be based on activity: “You’re asked to think independently, to either solve a problem or come up with a solution or to implement something, right, to either complete, implement or come up with a solution and you’re given autonomy to do it.” He then back-tracked slightly, deciding the category of professional was a “gray area” and that it might be better to define the category according to an ethic of commitment to getting the job done regardless of hours worked and employment laws on overtime. At other times, he combined both (discretionary) activity and a commitment to getting the job done, arguing that IT workers and engineers are generally quite close in how they approach the job and how they are treated by management:

We’re hired as professionals, we’re treated as professionals, and that’s how I expect to be treated. If I don’t act professionally I expect someone to tell me, right. There are different jobs. If you’re reading off a script and there’s liability because of what you say and someone can come back and make claims against the company then that’s different. In IT and engineering and that sort of environment you’re considered a professional.

Yet when probed about the control engineers have over their specialized knowledge and the feasibility of IT workers gaining similar control, Henry is pessimistic based on the rapidity of technological change: “I don’t know, I’m not sure if it’s feasible
because there’s so much different technology out there it would be a daunting task trying to regulate all that and the innovation happens so quickly.” In addition to the rapid pace of change in IT, Henry sees the IT elite as the only group capable of fully professionalizing based on companies inability to easily replace or outsource them:

[I]f IT workers were able to gain professional designation, it’s going to be a very small group of people who are going to get this designation and these would be the architects and the solutions type of people. The people who are doing system administration and support don’t fall under that at all, they in effect become like a call centre type of person and are at risk of being outsourced to whatever is the cheapest resource post.

Henry, like Cynthia, emphasizes here the heterogeneity of power and job security within occupations in the IT sector. He also draws attention to the role that IT, as the medium of labour, plays in undercutting the ability of IT workers to form an association or union to bargain collectively. The only people capable of forming an association that could bargain collectively are the IT elite who already have hold a strong bargaining position: “It doesn’t really matter for the top people who get the designation, they go and negotiate their own contract anyway and it’s not necessary.”

The technological barriers to collective bargaining suggested by Henry were a topic that Cynthia also noted. She does not see any way for IT labour to organize in the face of globally networked labour process:

Collective bargaining? [said with some disbelief] That would be too difficult in today’s environment. The nature of IT is that the world has become such that I could be working with someone halfway around the world and it would be the same as if I was working with someone down the street. So, because of the global marketplace and the global skills, [and] crossover and outsourcing to other countries, collective bargaining would cause local people to suffer. They already are, let's face it.
Amid Cynthia’s fatalism about the potential of IT workers to organize is empathy for those in the local IT sector whose work is precarious. In the face of any threat to organize, Cynthia is suggesting that multinational, and potentially even national IT firms would use their ability to geographically redistribute labour processes. Her assessment seems accurate based on Rhonda’s response to a question on collective bargaining.

As noted earlier, the call centre company Rhonda works for leases all of its property and equipment at its various sites. The same arrangement persisted through two sales of her company. According to Rhonda this is a corporate strategy that allows rapid relocation in the event that business conditions deteriorated in relation to corporate goals. Deterioration in this case also includes, or especially includes, any steps employees might take toward unionization:

That company could pick up and move in a week. That’s what a union would do. They would shut down and be gone to a different area that didn’t want a union in a heartbeat.

Yet, despite this vulnerability, Rhonda is strongly against any sort of collective bargaining association or union. She argued that unions lead to wages that make North American labour unattractive and unsustainable in the global economy, and that unions have largely become self-serving and, in fighting to retain jobs for members, a direct competitor of small businesses.

Even Anne, who is in a union, doesn't like the idea of collective bargaining. The union she belonged to represented both administrative and “sworn” staff (i.e., police officers), and the needs of administrative employees took a “backseat” to the
needs of the officers who outnumbered them. For Anne, the unionized environment inhibited not only her career mobility but necessary organizational change:

I would have preferred [no union]. There’s more advancement, more room for advancement. There’s a goal in mind. There’s a bottom line that will affect your position. In a union, to get any changes is very difficult, it’s long and it doesn’t happen very often.

Part of Anne’s unhappiness with the union reflects, I infer, her frustration with her manager who was able to retain her job despite incompetence, frequent absenteeism that shifted substantial coordinative activities to the five-person team Anne was part of, and the poor work atmosphere created (according to Anne) by the manager’s authoritarian approach. Due to the poor relationship with her manager, and the rigid hierarchal reporting structure, Anne noted that for two years she didn’t feel comfortable asking for a raise or requesting staffing support even though she felt greatly overworked.

In any case, what is clear from the IT workers I spoke with is that there exists both cynicism and opposition toward collective bargaining. Ever pithy, Vlad simply stated: “Trying to unionize people in the IT sector would be like herding cats.”

Regarding professionalization, there was also cynicism but opposition was replaced by confusion about what professional designation would entail, which IT jobs would be appropriated included, and if it would change relations at all. For nearly all IT workers participating in my research, the pace of technological change and the ability to relocate work stood as a conundrum they could not transcend when contemplating any sort of effort to organize.

The assessments by IT participants are mostly accurate. The IT sector is almost entirely nonunionized. The WALL survey suggested that around a third of IT
workers are part of unions, but this finding is a bit misleading. Most of the IT workers in unions are in the public sector, like Anne, providing IT support to large bureaucracies. Programmers, network administrators, database managers and other IT workers who actually work in the IT sector are not unionized in Canada. In the US, there have occurred the first steps toward unionizing workers in the IT sector. In 1998 contract IT workers at Microsoft formed the Washington Alliance of Technology Workers (“WashTech”), which is associated with and is partially financially supported by the Communications Workers of America (CWA). The formation of WashTech was spearheaded in the face of growing and long-term reliance on IT workers who felt that management at Microsoft was abusing the status, with many contract employees perceiving that they were, oxymoronically, permanent temporary (“permatemp”) workers (Brophy, 2008). Mainly WashTech has been involved in federal and state level lobbying on matters related to work visas, transparency by corporations regarding offshoring, and increasing monetary recognition for overtime. In 2003 WashTech led and signed its first collectively bargained contract. It has negotiated and signed three more since, and others are in the works. Yet WashTech’s status and future are more complicated than simply signing up members. Currently, after more than a decade it still does not “yet provide some typical services associated with unions, such as negotiating pay rates and contracts” (WashTech, 2012). WashTech notes it will facilitate such collective bargaining, one assumes through the CWA. More troubling for its future is the trouble it will have courting and then organizing workers in an industry and in occupations where individualism and professional commitment to get the job done
at any cost (as Henry argued) still dominate. In WashTech’s attempt to answer questions about the potential for unions to create rigid work rules and protect “bad” workers, it is clear that WashTech is attempting to disassociate itself from the structure of (or at least the perception of) unions in Fordist manufacturing: “None of us want less flexibility, rigid rules, a reduction in autonomy or no reward for merit. Rather, we believe that to preserve autonomy and flexibility, we must band together to better advocate for these things” (Washtech, 2012).

A similar status and story emerge from the examination of Alliance@IBM, part of CWA as well. It too has not yet achieved the right to bargain collectively and is currently an advocacy organization on issues similar to WashTech. Like WashTech, Alliance@IBM seeks to make itself more palatable to tech workers who associate unions with narrow job roles by emphasizing its support for flexibility, multi-skilling and other initiatives it argues make it less easy to justify firing. Other efforts like the IT Workers Alliance in Australia appear to have disbanded or at least ceased promoting itself (an assessment based on a complete lack of Web presence). The IT Professionals Forum for IT workers in India is another initiative that advocates politically for legislation related to the protection of and improvements in working conditions.139

In Canada, no collective bargaining efforts targeting IT workers in the IT sector exist. There is, however, a relatively mature but still nascent effort to achieve

139 Signposts to the Australian IT Workers Alliance and the Forum in India were provided by Brophy’s (2008) dissertation.
occupational closure for IT “professionals.” Created in 1958, the Canadian Information Processing Society (CIPS) positions itself as IT workers’ representative and an association similar to Canadian Council of Professional Engineers (which refers to itself publicly as simply Engineers Canada). Certainly, CIPS possesses some of characteristics similar to Engineers Canada. It has developed a Code of Ethics and Standards of Practice. It has developed a “Canadian Information Technology Body of Knowledge (BOK). In 1989 it even developed a designation, called the Information Systems Professional (ISP), which includes requirements around formal education, professional development, and even includes a (technical) skills test. CIPS has been successful in having ISP recognized legislatively as a “professional designation” by Alberta, British Columbia, Ontario, New Brunswick, Nova Scotia and Saskatchewan. Yet this professional designation has, after three decades, no official bearing on the actual practice of IT work though CIPS continues to advocate for raising ISP to a level where IT workers need it to practice in Canada. CIPS itself hasn’t had much success in being recognized by IT workers themselves. Of more than half a million IT workers in Canada only 6,000 or so (or about 0.01 percent of IT workers) are CIPS members. It is not clear how many of the 6,000 have actually acquired the ISP designation.

The point is not to belittle the efforts of CIPS, nor that of WashTech or other organizations struggling to bring IT workers together to improve their working conditions. My goal is rather to highlight the contradictions facing any effort to unite a group of workers who: 1) labour through and work on technology whose fundamental contribution to human development is the erasure of time and space;
and 2) largely identify with rational principles of management that seek efficiency, flexi-
bility, automation and profitability. These contradictions are both material—in the
tension between the socialization of IT knowledge and its privatization through patents, credentials, and/or closure—and subjective. While the subjectivity of the engineers and IT workers I spoke with have been at best a sub-focus, I have tried to be sensitive to their understanding of the objective conditions and changes going on around them and how they perceive trends and reasons for such conditions and changes.

The negativity exhibited by IT workers who participated in this study toward the possibility or goal of “full” professionalization and/or collective bargaining was also documented by Brophy (2008), who studied the WashTech phenomenon. She acknowledges “high-tech workers, despite the culture of disenchantment…for the most part still eschew collective organizing” (p. 156). But Brophy is optimistic, too, arguing that the case of WashTech is “an early, timid, faltering, but very real attempt to route around some of the constraints placed on collective organizing by the architects of that economy” (p. 165). Brophy is correct, of course; WashTech, CIPS and other efforts are genuine and creative attempts to rethink collective action among specialized labour. The irony, of course, and as I have tried to show in this study, is that the “architects” of global labour processes are not just corporate executives or their political allies who draw up the neoliberal trade agreements that enable if not promote offshoring; the architects are also the architects, the programmers and other IT workers who have built the very networks, systems and related software that now have the potential to unravel their privilege, diffuse
specialized knowledge, and inhibit efforts to apply organized pressure to mobile employers. The “socializing” strengths of the technology—dramatically decreasing the difficulty of transmitting information, sharing knowledge, tracking patterns, and automating routine intellectual activities—have become IT workers’ weakness in their struggle to control and improve their work.

**Conclusion**

As one variant of the saying goes, to a hammer everything looks like a nail. In the context of this project, which is oriented to critical comparative analysis of occupational groups, there is a danger of emphasizing difference. I have tried to remain cognizant of this temptation, taking time to recognize similarities between engineers and IT workers (and other specialists). Certainly, as I argued at the beginning of this chapter, engineers and IT workers are both “engineers” in that they apply scientific knowledge to practical problems. They are so close, in fact, that the sub-occupation of “computer engineer” bridges the two occupations. Struggles over whether to recognize software engineers as full engineers or not suggests a continuum more than a neat division, at least in relation to technical relations of production. In terms of work, both groups report high levels of technical complexity and control over the activities associated with their role. Dissimilarity occurs, however, in the realm of organizational decision-making, including both strategic and operational matters. Here, engineers described high levels of participation in decisions regarding staffing, budgets, timelines, and completion of the projects they planned. Similar to the survey data from Chapter Six, IT workers I spoke with reported much less involvement in organizational decisions relevant to their work,
the result being labour intensification, narrow responsibility, frustration, and even
the withholding of ideas for fear that more work would be piled on with no
additional pay or organizational support.

I linked the divergence in organizational form and “voice” to the occupational
closure engineers in Canada have achieved, and IT workers have not. I argued that
this finding, while tautological in some ways, is nevertheless important and
demonstrates that specialized knowledge is only “special” (in conferring broad,
organizational power) where it is protected either legislatively via right-to-practice
certification and/or closure through collective bargaining. Put another way, and in
contrast to celebratory rhetoric around the knowledge economy and the knowledge
class, knowledge is not equivalent to capital, nor is possession of theoretical and
specific knowledge akin to ownership over the “means of production”140 (even if
knowledge is a key “force of production”). My findings suggest that specialized
knowledge is not enough to make employees immune to rationalizing efforts that
deskil their work or to exempt them from pressures related to supply and demand.
Workers still need to organize even when they possess specialized knowledge. I
then moved on to examine the potential for IT workers to: 1) professionalize more
fully, supported as engineers in Canada are by legislation that inhibits the practice of

140 While The Economist is not known for hyperbole, it printed without critique Peter Drucker’s claim
(2001) that “knowledge workers, collectively, are the new capitalists. Knowledge has become the key
resource, and the only scarce one. This means that knowledge workers collectively own the means of
production. But as a group, they are also capitalists in the old sense: through their stakes in pension funds
and mutual funds, they have become majority shareholders and owners of many large businesses in the
knowledge society” (5th paragraph, italics added for emphasis).
engineering without professional certification; and/or 2) bargain collectively. I found the road to both outcomes blocked technically and ideologically.

For most engineers, they must be in the proximity of the mine, chemical, assembly line, robot, polluted land, and so on, that they are working “on.” In contrast, for increasing numbers of IT workers new digital technologies, the medium and object of their labour, have meant it doesn't matter where they, their coworkers or their managers are located. Their labour process can be connected digitally through a network of individuals transmitting “immaterial” services and goods. The work of IT specialists is also increasingly well understood, and strategies and technologies are maturing in a way that control of the entire labour process can be and is being centralized. While the IT workers I spoke with didn't report routinization or job fragmentation as such, they spoke in depth about the rapid changes in routinization and fragmentation they saw going on around them, and how this was a major factor in offshoring and outsourcing. In contrast, the engineers I spoke with talked about the stability of their occupation and how the local nature of their projects largely protected them from offshoring and the need for professional designation protected them from outsourcing.

There are two other findings from my interviews that are worth highlighting, for they are less well studied than professionalization, offshoring, and outsourcing. One is the growing vulnerability to automation for those IT workers who were previously immune based on the complexity of their work. As Vlad described, programmers are targeting programmers in what might be called a cannibalistic fashion. Simultaneously, IT workers are being asked (and are seemingly not
disturbed) to “write” themselves out of work. That is, in a process of what can be called “auto-automation” IT workers like Vlad and Henry took active, willing roles in designing systems that make obsolete a task they were formerly responsible for completing. The formal rationality of this auto-automation was commonsensical until, for Vlad at least, he built products that effectively made him and his colleagues unnecessary at a time when his employer was looking to and eventually did downsize his department.

The other finding worth highlighting is what I call “downsourcing,” the shift of an entire (non-fragmented and non-routinized) specialist job to a less well-paid, non-specialist worker. Three of the IT workers I spoke with came from non-IT backgrounds, and had been recruited within their company as “super-users” because of their interest and aptitude. The trend toward downsourcing, and I argue there is some support for believing there is one, is driven by non-IT companies that currently pay substantial amounts to IT consulting and product development companies. These organizations, as “end-users,” want products built on open source platforms and specific to their needs, organizational structure, and work flow. First, this reduces costs associated with proprietary software and, second, reduces costs for IT service support by downsourcing some or all support functions to internal staff. Organizations, I argue, increasingly recognize that there is a pool of capable, underemployed service and industrial “super-users” who are willing to perform self-directed learning and take over specialist IT roles for much less money.

One might argue that the phenomenon of downsourcing is but an offshoot or logical conclusion of the trend toward teamwork, employee empowerment and
involvement, job sharing and job rotation, and other humanist strategies. More
cynically, it could be argued that downsourcing is not much different than processes
of routinization that lead to job fragmentation and the redistribution of these
“shards” of work to less technically competent and less well paid workers. I argue
that downsourcing is different. Humanist strategies and job fragmentation both take
small parts of design and planning functions, leaving specialist occupations largely
intact. Downsourcing on the other hand breaks down occupational boundaries,
taking the routine and the complex in a process of redistribution to non-specialists.
This has important ramifications for employees in more “open” specialist
occupations like IT work, potentially decreasing demand for those with formal IT
training and further undercutting the organizational power of current and future IT
workers. It also has important ramifications for the working class in service and
industrial jobs; as the findings indicate in the last two chapters the lack of rigidity in
the division of labour has been a major factor in the expansion of job complexity,
discretion and involvement in decision-making for these workers. In the following
“discussion” chapter I link the quantitative findings from chapter six more directly
with the mainly qualitative findings from this chapter, and use the conclusions
emerging from this synthesis to explore the existence or degradation of class
boundaries for specialists and managers.
Part 4 – Discussion
Chapter Eight – Work, Organization and Class

Introduction

At the beginning of my findings chapters I identified a series of shared premises that emerge out of optimistic theories of a new knowledge (or creative) class. They relate to: 1) Economy (increased pace, uncertainty, increasing scientific and technological complexity); 2) Number and Education (of specialists and specialist managers); 3) Activity (the nature of knowledge work and much managerial work defies surveillance and routinization); 4) Power/Authority (specialists and specialist managers are gaining immense power within organizations via knowledge and organizations are being forced to move away from bureaucratic structures); and 5) a New Class (such specialists and specialist managers form a new class that is challenging the capitalist elite for socio-economic control). As I noted, there is little dispute with Premises 1 and 2. What I take issue with is the wide-spread tendency to read off Premises 3 and 4 from Premises 1 and 2, and to use such indirect proxies as the basis for Premise 5. As I argue in the conceptual and methodological chapters (Four and Five), critical labour process theorists and researchers offer a set of theoretical and research strategies that lead to more direct measures of the activity, power and class location of specialists and managers. I argue as well that such direct measures are best studied by combining qualitative and quantitative data.

My expectation was that findings would show an increasing percentage of specialists and managers are vulnerable to the routinizing and centralizing tendencies
that impact other employees, and that specialists are growing increasingly heterogeneous, both intra-occupationally and inter-occupationally. The implication of these expected findings is that: a) specialist and managers remain subordinate to the capitalist elite within the social relations of production; and b) theorized boundaries between the capitalist elite and senior managers/top specialists, on the one hand, and specialists/managers and the working class, on the other, are too unclear to make any defensible claim about a distinctive knowledge class. I believe that the evidence presented confirms my hypothesis vis-à-vis ongoing subordination of managers and specialists to the capitalist elite, but the evidence related to my expectation of not finding boundaries around a class of managers and specialists is not, overall, supported. I propose that boundaries persist and reflect exploitative relationships, though register that more research is needed.

In the early part of the chapter I acknowledge the trend toward socialization (i.e., a reduction in specialists’ and managers’ individual autonomy) that potentially makes class locations less discrete. On the one hand, specialists and managers are experiencing direct challenges to their privilege as employers seek to increase efficiency and reduce labour costs via “socialization.” In contrast to claims of immiseration via homogenization (where many specialists are proletarianized), the socialization I find—supporting Adler’s optimistic reading of Marx’s socialization/valorization contradiction—suggests overall upgrading of the entire workforce, as cooperation, interdependence and trust increase. Specialist and managers’ autonomy-control is diminished in the process of socialization. For some, such a decrease appears to be “deskilling” and “deprofessionalization” via job fragmentation and exclusion from decision-making. For many more in specialist and managerial occupations, however,
the decline in autonomy-control is occurring alongside increased involvement in organizational decision-making.

These findings and insights from my interviews lead me to conclude that many of the optimistic knowledge class theories accurately capture the trend toward worker involvement in rapidly changing, uncertain labour processes. Such theories, however, dramatically overstate the percentage of specialists and managers involved in strategic decision-making and, overall, the ability of such workers to control production and profit. Evident, I contend, are barriers to the rise of a specialists and managers based on their fundamental position as sellers of labour within capitalist social relations of production. That is, specialists and managers are still very much employees; while they are experiencing upgrading—in a holistic sense of making decisions about the broader context in which they perform their specific job(s)—they nevertheless remain largely excluded from key processes of strategic decision-making. Many of the IT workers and all of the engineers I spoke with reported involvement in operational decision-making but none, even the most senior engineers and those who had transitioned into management, reported making decisions related to the structure of the organization, mergers, outsourcing, promotion of senior managers, and so on. They made decisions about how to enact such initiatives after the initiatives themselves had already been approved. Upon such evidence I argue that the capitalist elite in Canada retain overall control within the social relations of production. Such relations are dynamic, and those in senior managerial roles or with scarce expertise in specialist fields occasionally move into corporate leadership roles characterized by large bonuses and executive share option systems. But such mobility continues to be inhibited for most specialists and managers by a bottleneck at the top of organizational hierarchies.
On the question of whether or not specialists and/or managers form a class distinctive from the working class, the evidence from my study suggests that optimistic knowledge class theories are accurate in their identification of a resilient boundary. While much further study into downsourcing and socialization is needed, I make a cautious and qualified proposal that a specialist-and-managerial class (SMC) exists in Canada, built around both stable and dynamic processes of closure that maintain members’ prerogative to “meaningful” coordinative and conceptual labour activity. The SMC is less distinct than in the past, internally heterogeneous, and, as noted above, certainly not dominant or even equivalent to owners and senior corporate leaders. Despite this, I submit that many specialist groups (including specialist managers) are finding novel ways to maintain and even extend control over their respective spheres of conceptual and planning activity. I argue that, where optimistic knowledge class theses largely ignore the agency of capitalist elite to find ways to retain control and increase profit, the optimistic socialization theses largely ignore the agency of managers and specialists to rework and maintain the division of labour that creates real, exploitative class boundaries among waged workers.

In extending a popular workplace metaphor, there are durable “ceilings” to the rising participation for the majority of the working class and, equally, “floors” to the decline in conceptual and planning activity for many specialists and managers. If one accepts exploitation as dependence on the material deprivation and suffering of another for one’s own material gain, then the SMC gains some of its distinctiveness through its exploitation of the working class (via closure in the labour market and exclusion and domination in the labour process). This form of exploitation, while important and deserving greater recognition, must be contextualized and not allowed
to obscure the overriding exploitative, class-making relationship between the capitalist elite (owners and corporate elite) and workers in general.\textsuperscript{141}

I conclude the chapter with a little "social forecasting," predicting that, despite the durability of class boundaries, the contradiction between the drive to socialize knowledge and labour processes and the drive to privatize wealth and knowledge will intensify. The working class is experiencing upgrading (opportunities to engage in complex work) but its acquisition of capacity via formal and informal learning is growing faster, and heightened class-based conflict is a very real possibility.

**Socialization, Valorization, and Contradiction**

The strength of the various knowledge class theses, whatever their particular label, has been charting how the knowledge base (codified theoretical/symbolic knowledge), new technology (the computer chip and the explosion in information technology), and the role of scientific-technical research in organizational success is connected to growth in professional, specialist, expert and specialist managerial occupations. But this strength is also the weakness of such theories, as attentiveness to these trends encourages a rather one-sided reading (and projection) of changes within the social relations of production and around class power. My findings on job complexity largely support the optimistic knowledge class (KC) theses with regard to skill (as complexity)-biased technological change in the labour market. Concerning

\textsuperscript{141} Again, the notion of “levels of analysis” is important here. If one is studying the potential transformation from a capitalist to a socialist/communist mode of production then exploitation based on knowledge and decision-making should carry equivalent theoretical weight. Every actually-existing communist country has had a knowledge/technocratic elite “exploit” the general population. I am only arguing that in an analysis of an advanced capitalist country exploitation based on closure and the division of labour doesn’t structure a given society to the same degree as exploitation based on ownership and/or possession of the means of production.
specialists and managers, however, the contradictory findings of (falling) autonomy-control and (rising) involvement in organizational decision-making present a paradox that cannot be accounted for by many KC theses. A rather coherent explanation for this seeming paradox is offered, however, via a particular (and some would say peculiar) reading of Marx that suggests capitalists will upgrade and empower the working class as they socialize the labour process in pursuit of greater efficiency and competitive advantage.

**The Contradiction between the Forces and Social Relations of Production.**

Marx was particularly adept at cutting through the complexity of capitalism as a historical social formation and exposing the root contradictions that generated both its dynamism and the logic for its potential transformation. Fundamental to his analysis of capitalist development is the efforts that capitalists (and their managerial delegates) put into organizing labour, or what Marx referred to generally as “real” subsumption. For Marx, then, a real (as opposed to just logical) contradiction between the forces and social relations of production is fundamental to the capitalist mode of production. The contradiction can be thought of as emerging from the incompatibility of socialization and valorization: a) capitalist organizations are compelled to seek greater productivity through increased interdependence of workers and the use of sophisticated technology (“socialization”) in order to adapt, compete, and thrive against other firms; and b) those controlling capitalist organizations are simultaneously under pressure to maintain control over production such that capital increase can be maximized via profit (“valorization”). Implicit in the concept of valorization is the notion that private property rights enshrined in the legal system must be protected and that labour must create value beyond what it is paid for.
Marx celebrated the bringing together of more and more workers into interdependent, dynamic labour processes, and the consequences of this socialization for increased education and potential for solidarity. Socialization in this sense is “class-making.” Marx proposed that the process of socialization in combination with advances in machinery would lead to homogenized skill levels and the absolution of skill-related rents. Less clear is if this homogenization was/is also “immiseration.” Certainly, there are times when this homogenization appears in Marx’s writing to be linked to immiseration and dropping job complexity and control, particularly when Marx discusses the role of machinery (where workers become mere appendages) or when combined with his suggestion that capitalism creates its own gravediggers. Yet, overall, there remains significant ambiguity in the consequences of this contradiction.

**Competing Interpretations of the Socialization/Valorization Contradiction.**

There is a broad division within Marxism between those who perceive the development of the forces of production as external to the social relations of production (i.e., technological determinism) and those who perceive development of the forces of production as endogenous to social relations (i.e., the social construction of technology). The former shares much with the optimistic knowledge class theses, which adopt various strong and soft versions of technological determinism in placing development of technology outside of human activity (and struggle). The latter reading of the contradiction places development of the forces of production within and deriving from the social relations of production. There is substantial evidence that Marx tended to the latter understanding (Young, 1976). In any case, the latter understanding is what fuels the primary, competing interpretations of Marx’s core contradiction, and is most compelling vis-à-vis explaining my findings.
One technology-as-endogenous interpretation is decidedly pessimistic and emphasizes the homogenization and degradation of labour via the capitalist elites’ drive to socialize the labour process. It is the interpretation that was central to Braverman’s analysis of the labour process in a situation of monopoly capitalism (see Chapter Three). Braverman’s emphasis, from my reading, takes a narrow approach to “socialization” as simply a process of bringing workers together in order to usurp workers’ individual and collective control over the labour process, and to increase productivity so as to valorize capital. Agency is really only in the hands of the capitalist elite. Valorization is pursued relentlessly via rational systems, designed by but ultimately enveloping many engineers and other specialists who study, standardize and centralize the knowledge of the working class (simultaneously privately recognized and publicly denied). The result, according to such logic, is declining complexity, control and participation in organizational decisions, big or small. The structurally derived power (agency) of the capitalist elite, and the managers they delegate power to, is determining of the composition and job quality of labour. The findings from the surveys and interviews do not appear to support an immiseration thesis as it applies to complexity and control of work.

Rather, an alternative, more optimistic interpretation of Marx’s socialization/valorization thesis holds greater explanatory power for the trajectory of change suggested in the survey data. Discussed in various places in Chapters Two and Three, there are two main variants: one is associated with the quite radical re-reading of Marx’s work promoted by autonomist Marxists that emphasizes the agency of the working class; the other is associated with a more traditional reading that emphasizes structurally derived causes for upgrading. For my purposes here I associate the first
position with theorists like Antonio Negri and Nick Dyer-Witheford and the second with Paul Adler. Autonomist theory as espoused by Negri and extended by Dyer-Witheford makes central the “socialized” or “mass” worker as an “active subject of production, the wellspring of the skills, innovation, and cooperation on which capital depends” (Dyer-Witheford, 1999, p. 65). Here, socialization is the outcome of struggle, capitalist elite reactive and the “multitude” already strong even if they don’t quite grasp their power (see Chapter Two for a more detailed review).

Paul Adler has interpreted the contradiction in a different (he claims more traditional) way. His interpretation (see Chapter Three, “Rethinking of the Labour Process”) shares a structural determinism with Braverman but, like the autonomist Marxists, argues that the work force is increasingly capable of coordinating complex labour processes, distributive networks, and the general control of society. The process is driven by the structure of the capitalist system that forces owners and organizational elite to constantly compete and grow their capital. In the process, strategies are sought to make labour more efficient and one of the main ways is by getting more and more workers involved in operational problem-solving and decision-making. But doing so enhances workers’ claims for a greater share of profit, and thus employers are simultaneously compelled to take steps to reduce dependency on and the power of labour.

In both the pessimistic and optimistic interpretations of this contradiction, as the capitalist system progresses and more and more workers are brought into the working class, the social relations of production—where wealth is accrued by a tiny minority—become a “fetter” that is a barrier for further development of productive forces. The contradiction will be resolved, dialectically, and society will proceed to
develop a new, more socialized (i.e., collectively owned and controlled) mode of production. In one interpretation, following Braverman, workers have immense capacity but are nearly completely deskill (i.e., cut out of “conceptual” activity and relegated to mind-numbing work); in the other interpretation workers are increasingly depended on their (collaboratively enhanced) knowledge, are taking over more and more coordination, and come to realize they don’t need the capitalist elite. We might roughly call the first a revolutionary vision, the second a reformist (Adler, 2007b).

In neither interpretation of the socialization/valorization contradiction are the consequences for specialists or their class location dealt with in a sustained, fulsome way. In Braverman and among those who follow his lead, there is the repeated suggestion that a small elite of employees will plan work and design machines, with a large and growing majority of both blue- and white-collar workers allowed only to blindly execute received instructions. In contrast, Dyer-Witheford and Adler argue that monopolies on knowledge, in the form of professions or trades, are incompatible with long-term trends toward codified, universal and easily shared knowledge, interdependence and the generalized participation in designing specific work or operational decisions. In the scenarios presented by Dyer-Witheford and Adler, there is a shared suggestion of a general trend toward deprofessionalization (a loss of knowledge monopoly) and, for increasing numbers of specialized and managerial labour, further proletarianization (a loss of access, or right to, conceptual activity).

Admittedly, Adler depends on proxies like occupational code and education level to support his argument, proxies that I have criticized. Such a reading of Marx’s contradiction remains on the margins of Marxism, generally, and labour process theory, specifically. The optimistic reading of socialization is generally dismissed by leading
neo- and post-Marxists; rather, they emphasize (class) conflict, agency and subjectivity, and/or contingency theories of managerial strategies and capitalist development. Where the agency of the working class is claimed to be overplayed in autonomist Marxism (P. Thompson, 2005), in Adler’s work the teleology that lurks within his dialectical “upgrading” reading of Marx is criticized, as is his perceived technological determinist notion (P. Thompson, 2007) that the forces of production (including managerial technique, skill/knowledge and mechanical technology) are leading to a long-term increase in the quality and interdependence of work. I share some of these reservations yet, in terms of directionality over the last twenty years or so, my evidence appears to strongly support an optimistic socialization thesis.

**The “socialization” thesis in relation to the findings.**

In examining how an optimistic reading of socialization relates to my findings, the autonomist Marxist analysis tends to be global in scope and thus I turn mainly to Adler, who presents his argument along themes that are appropriate to the labour process focus of much of this project. Adler proposes that, if his version of the socialization thesis is valid, we should have witnessed a continued and significant rise in the complexity of work for all employees. This is not in spite of rational approaches like scientific management but rather because such strategies make knowledge explicit and transferable. Likewise, skills are not rising despite new technology; driven by the need to build competitive advantage, scientific discoveries in the form of novel devices and processes are driving the trend toward more complex work, partly through automating the most routine work but also because they increase the cognitive, analytical requirements via feedback mechanisms and rapid exchange of information via networks.
The findings in my study suggest that skill (as complexity) is indeed rising for all workers, though it is not clear from the twenty-year break between studies if the change is secular or cyclical, and my findings are limited to Canada without further comparative analysis (see Clement & Myles, 1994). The pace of change (new skills) is relentless, and the level of skill and length of time to become proficient at one’s job are both increasing. As well, reports of rapid technological changes were strongly correlated with rising job complexity. Findings from my interviews support the quantitative findings; none of the engineers or IT workers I spoke with reported their jobs becoming less complex, and all described having to learn new skills in order to perform their work. All of this sounds much like the mainstream theories on “skill-biased” technology, and the findings can easily be incorporated into either the all-boats-are-rising proposals or the distinct knowledge class theses. Where Adler’s reading diverges, and this is key, is in his claim that professionals and other specialists, as well as managers, will experience a decline in autonomy. In fact, as outlined in Chapter Three, he claims that concern with autonomy is anachronistic and what researchers should be focused on (in studying labour processes) is interdependence. I translate this to mean Adler welcomes declining autonomy for specialist, indicating for him a hastening of the socialization that will ultimately bring the socialization/valorization contradiction to a head. Delaying for the moment evidence on whether or not autonomy is the wrong metric for understanding workplace change, the socialization/upgrading thesis again appears to be correct about the trend toward less autonomy among specialists.
Reduction in Autonomy, Increasing Interdependence, and the Socialization of Specialized Labour

Specialists and managers (and supervisors) reported declining opportunity to design their work or the work of others while those in the working class (service and industrial employees) reported widespread increases in opportunities to plan their work and/or the work of others. In 1983 over 80 percent of managers, supervisors and specialists reported they designed their work all or most of the time. By 2004, the percentage was around 70 percent. Against these relatively moderate drops, the gains by service and industrial workers were much larger. In 1983 just 30 percent reported designing work all or most of the time. In 2004 the percentage had risen to almost half.

It is impossible to know without more detailed, organization-specific research if the increase among service and industrial workers came at the expense of managers, supervisors and specialists—a zero-sum phenomenon—or if the gains were in spheres of unrelated activity. Within engineering and IT work, there is certainly evidence of the former. Professional engineers in Canada are already talking about the issue of non-engineers—usually trained technologists—taking on engineering activities, and how engineers as a profession should respond (O'Grady, 2009). In examining downsourcing, I noted that Trisha fits the definition of a less or un-credentialed individual performing the work that would normally be the purview of a professional engineer (e.g., design

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142 For example, a barista in a coffee shop might report significant, rising autonomy in how he prepares, flavours, foams and mixes specialty coffees that doesn’t take away control from specialists in central research and marketing who decide coffee type, the most cost-effective espresso machine, location of the coffee shop, marketing plans, and so on. Certainly, there is infringement on the manager’s role that, in many so-called McJobs, has been to identify and enforce quality standards related to taste, presentation, and so on. In such a situation, the division of labour largely remains intact for specialists but not for supervisors or lower level managers. Alternatively, where the barista is asked to make up menus, create advertising, research and order coffee the result is a change that would infringe on the traditional roles of both managers and specialists in the service sector.
work, managing other engineers, consulting with clients). Within IT, Patricia described in some detail the way in which the hotel management company she worked for recruits “super-users”—often front-line staff with no formal background in IT—to perform roles that traditionally belong to IT workers. Rhonda is one of these super-users, recruited from the “floor” of the call centre where she started as a customer-service agent answering technical questions. While she is designated as (and is) an IT worker, one must assume that there are many more like Rhonda who operate in organizations like Patricia’s, where super-users aren’t paid any more, offered a new designation, or offered a formal internal career ladder. The issue of organizations downsourcing specialist jobs to “super-user” is a provocative one, and I feel demands further research. There is evidence that non-specialists are taking on routine and non-routine tasks in a variety of specialist occupations, including law (Burk & McGowan, 2010) and accounting (Muzio, Ackroyd, & Chanlat, 2007). Yet it is very doubtful the trend of downsourcing will take off among engineering firms in Canada, based on the regulatory framework in this country, and I am not convinced that it is a major trend even among IT workers, at least not yet.143

Rather, as Adler argues, it appears that specialists, managers and supervisors are losing “autonomy” as they are drawn into more interdependent, complex labour processes where efficiency demands decisions be less centralized and more collective. There are two main points here. First, there has been a massive shift in the size of organizations in which specialists are employed (see Table 6.9). In 1983, almost half

143 According to the WALL survey, over three-quarters of IT workers have at least some post-secondary education. It is not possible, however, to know if their formal schooling relates to IT.
worked in organizations with less than 100 employees. By 2004, only around a third were still working in small organizations while the percentage of specialists working within organizations with over 1000 employees had increased from under a quarter to well over a third. As the literature generally predicts, those specialists working in large organizations enjoy less autonomy-control than those in medium or small organizations. The same pattern of decreased autonomy-control holds for managers and supervisors (i.e., less discretion in larger organizations), though their organizational distribution did not follow the same pattern as specialists (the distribution of managers did not change while there was a large increase in supervisors working in small organizations).

Findings in Chapter Six indicated rising levels of complexity and simultaneous shrinking autonomy control among specialists. Adler's thesis is useful here, as well, if we integrate the findings on involvement in organizational decision-making into the complexity/autonomy mix. I argued in Chapter Four that the concept of deskilling was too narrowly defined if it focused only on complexity and task-level control, and that for a job to use the full range of a person's “conceptual” capacity the incumbent would have to be involved in the organizational planning that is so important for shaping the broader work environment in which job-specific discretionary decisions are made. I made this point empirically in Chapter Seven, where I contrasted the involvement of engineers in organizational decisions with IT participants' lack of involvement. IT workers reported increasing complexity of their work a fair amount of control over their day-to-day tasks, but they also reported having little input into decisions over deadlines, organizational structure, and personnel. Think of Henry's refusal to contribute ideas for fear he would be saddled with additional work with no additional remuneration or staff support, or
Patricia leaving her job because unrealistic deadlines and no ability to influence hiring decisions left her approaching burnout. I argued that IT workers were indeed more often de-skilled in a holistic sense relative to engineers, even though the two occupations reported similar levels of job complexity and autonomy-control.

At a higher level of aggregation, allowing comparison between the 1983 and 2004 surveys, the findings (see Table 6.11) indicate participation in organizational decisions is rising for all occupational groups, and within each group for those in nearly all sizes of organization (only managers in organizations with over 1000 employees reported a drop in involvement, a 10 percent decrease; there was no statistically significant change for managers in organizations with less than 100 employees). As a group, specialists’ rising decision-making was primarily in the “as part of a group” category, from just over ten percent in 1983 to over a fifth in 2004. Interestingly, the data suggest—and I am being slightly tentative here because of small sub-sample sizes, especially in the 1983 data—that in large organizations specialists experienced the largest increase in participation and the largest decrease in autonomy-control.144

In examining complexity, autonomy-control, and involvement in relation to one-another, these findings suggest that the lawyers, doctors, engineers, accountants and other specialists who find themselves embedded in more complex, interrelated, and interdependent labour processes are losing independence but may be145 gaining “real”

144 The relationship between discretion and decision-making was weaker among specialists working in large organizations (.148 in a Pearson correlation; significant at the 0.05 level; N=277) than specialists in general (.289 in a Pearson correlation; significant at the 0.01 level; N=831).

145 This is speculative, of course, as there is no way to tell via comparing 1983 and 2004 data or correlations (see note above) if the loss in discretion was accompanied by an increase in decision-making involvement for the same specialists. But the data, cumulatively, do speak to social relations in general.
opportunities to participate in operational decisions and to exercise their cognitive capacity as it relates to systemic planning and not just for narrower day-to-day responsibilities. It isn’t that they are losing power even as they lose autonomy; it is that their work is shifting from individualized activity (where task complexity is high but organizational complexity is low) to a much more organizationally complex, intensely interdependent labour process. The preponderance of specialists in large organizations suggests, too, that we are not witnessing a growth in the type of “collegial” socialization common in knowledge-intensive or professional-partnership organizations proposed in the literature on post-bureaucracy. Rather, specialists are more and more part of large hierarchical, bureaucratic organizations. Adler has proposed that the pressure on management to use the knowledge of all workers to improve efficiency is driving an evolution in the bureaucratic model. We are, he claims, witnessing the emergence of “enabling” bureaucracies that are built around hierarchy and even market principles of competition, but simultaneously are structured around growing trust and collaboration (see Chapter Three). Adler (2006b) describes enabling bureaucracy as “a dense web of rules and a finely differentiated vertical and horizontal division of labor with high levels of trust and community cohesion” (p. 215). The main theoretical contribution by Adler is that, pace both Weber and Gouldner, bureaucracy can be simultaneously enabling and coercive.

146 My findings on the autonomy-control of specialists contrast with Choi et al. (2008) who find that, in Australia at least, bureaucracy increases autonomy-control for the more (formally) educated while reducing autonomy-control for the less educated. Most interestingly, they argue that autonomy-control is an outcome of broader workplace power, not causal of power. That is, those with more power are able to manipulate the introduction of new technology and managerial strategies in a way that allows them to retain autonomy-control. I revisit the findings by Choi et al. later in the Discussion.
The evidence from my interviews supports such a proposal. Where the engineer Trisha is employed in a small, family owned organization with relatively little hierarchy, and Robert and Chad are employed in professional-partnership organizations (Greenwood, Hinings, & Brown, 1990), Trevor, Hui and Matt described large organizations and bureaucratic structures where formal reporting structures were clear and extensive but where they were simultaneously trusted to not only perform their job but to initiate collaborative projects and propose changes in operations and products. Trevor described having to seek “corporate” approval for most purchases and having little input into many centralized decisions but, within the same role, he described spearheading efforts to engage all employees—specialist and otherwise—in improving mine safety. Within the nuclear plant where he worked, Hui reported fairly rigid divisions between management and specialists, including a broken internal job ladder, and the need for approval to design and run safety tests. Yet he also described a high-degree of trust such that if he thought a safety test was important, and he could clearly convey this importance based on the logic of operations, he was almost always approved. Matt lamented the negative consequence of bureaucratic paperwork on both creativity and quick thinking, but also spoke at length about the trust he was granted and passed along to the engineers and technicians working in his quality- and safety-testing department.

Hierarchy, centralized decision-making and standardization play a more central role in the working lives of most of the IT workers I spoke with, but there is still evidence of enabling aspects within bureaucratic structures. Just as Adler found in his study of the IT sector (2005), I find evidence of both principles of rational management (coercion, centralization and routinization) and principles of trust and collaboration.
(consent, decentralization, community and collective decision-making) operating simultaneously. Henry was expected to structure and document his work according to standardized steps in a software development project management system, but was simultaneously given an informal green light to solve issues by skirting the hierarchal reporting structure. Vlad’s coding work was expected to adhere to programming guidelines published within his company and he was expected to use and contribute to a massive knowledge repository, but he was allowed to work from home and to decide on time-lines for completion of his projects. Cynthia was expected to use and contribute to the same knowledge repository and, while she certainly reported alienation (in the humanistic sense of the term) from broader strategic decisions, she worked within her unit to make team-based decisions and performed significant informal learning in order to complete her work. Anne described a situation where the hierarchical nature of her organization prevented her from advancing, from following through on some of her proposals, and from talking openly about the failings of her manager. At the same time, in the projects she was allowed to move forward with she was empowered to collaborate with any bureaucratic or policing staff who would allow her to more effectively and efficiently complete her work. Rhonda had little control over deadlines or the type of reports she ran relating to the call centre, but her technical expertise was deferred to in daily matters and she had significant voice in the process of upgrading the company’s data management system.

Overall, Adler’s main thesis on technology, labour process and organizational change seems to be supported, at least over the last two decades or so and probably longer. The knowledge-intensity of productive and organizational activity has increased substantially, even if it is often overstated. His claim that knowledge-intensity demands
greater trust—embodied in collaboration, interdependence, and employee participation in decision-making—is also generally supported by my findings, even if some respondents overestimate their involvement. While Adler is somewhat difficult to pin down regarding the trajectory of professionals and semi-professionals, and I want to be careful not to simplify his work, the proposal that the labour process will continue to become more interdependent, collaborative, and demand greater knowledge of all employees strongly suggests a break-down in clear boundaries between managers, specialists, and the working class.

**Implications of the Socialization / Upgrading Thesis for Class Analysis**

Extrapolating from Adler’s positive interpretation of scientific management as it relates to the breakdown of guilds and “rural idiocy”—making knowledge universal, accessible and increasingly productive—one can only assume that he welcomes, too, the end of what might be called “professional idiocy.” More and more, I infer, work demanding specialized knowledge will move from self-employment, professional-owned small businesses like doctor’s offices, from small consultancies to large (more and less enabling) bureaucracies, and from isolated departments to integrated teams. Knowledge management (via repositories, best practices, mentoring, job sharing, and standardization) will take over the current role of professional associations, and set specialized knowledge free of current formal and informal division-of-labour restrictions. Adler’s thesis even presents an upside to the outsourcing and offshoring discussed by participants in my research, which affected mostly the IT workers but is at least “on the radar” of the engineers (Committee on the Offshoring of Engineering,
Adler interprets offshoring as further evidence of the globalizing phenomenon of socialization, where more and more workers are drawn into interdependent relationships, whether as part of the same, geographically distributed labour process, as part of a single supply-chain involving collaborating firms, or even looser networks of organizations cooperating in ad hoc arrangements.

The implication for class analysis appears to be that the structure of a maturing capitalist system as exists in Canada is accentuating the contradictions inherent in the work of specialists, undercutting their discretionary control over knowledge important in the labour process, and incorporating them more and more into the “global” or “collective” worker. Yet neither my findings nor the theses put forward by Adler or Dyer-Witheford suggest a complete homogenization of the labour force. Rather, the class structure suggested is one that corresponds in many ways with Erik Olin Wright’s early and late work on contradictory class locations, particularly the former. The proposal that managers and specialists simultaneously function as capital and labour, and therefore exist in contradictory locations, seems entirely compatible with the

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147 Evidence indicates that engineers in other jurisdictions may be more prone to offshoring than Canadian engineers. The US-focused report by the Committee on the Offshoring of Engineering suggests that offshoring is a very real threat to the profession.

148 Autonomists Marxists might contest the reasons for the breakdown in boundaries and outsourcing, vis-à-vis capital’s need to decompose active labour as much as to compete against other firms (private sector) or reach budgetary and efficiency targets (public sector), but it seems they would broadly agree with the trend to and desirability of the dispersion of specialized knowledge.

149 As noted earlier, Wright’s early theorization focused on control over productive resources (authority) and autonomy, while his latest theorization proposes that managers, due to their control over organizational assets, and professionals, due to their control over knowledge via credentials, are simply less exploited than the working class. Both contrast with his second formulation where managers and professionals are both exploited (by capitalists) and exploiters (of the working class). In many ways Wright’s work anticipates further conceptual work like Adler’s on the structural dismantling of class boundaries among managers, specialists and the working class. Wright’s class theorizing began, after all, as an effort to rethink neo-Marxist theorizing that proposed new, distinct boundaries between a new class (or new classes) and the working class, proposals that did not seem to him to be supported theoretically or empirically. Adler’s work is in the same spirit, but rather focuses on perceived shortcomings in labour process research that denies upgrading and greater involvement for the working class.
notion that such managers and specialists experience bureaucracy as contradiction—enabling and coercive. Wright’s work also adds further nuance in directing attention to the heterogeneity between and among managers and specialists, a phenomenon that doesn’t receive enough attention within the socialization thesis.

My findings suggest significant heterogeneity among specialists in ability to control the context of one’s work (organizational decision-making). My findings also suggest less though still important heterogeneity with regards to job-specific autonomy-control. If not polarization, certainly there has been a widening of the range of autonomy-control and participation both within specialist occupations and among them. Diversity among managers has always been significant, shaped by the stretching of managerial assignments within bureaucracy from senior managers and technocrats all the way to low-level supervisors who have little delegated power other than enforcing rules and norms and reporting information to more senior managers. As knowledge-intensive firms expand, specialist occupations are experiencing growth in junior and supporting positions; nonetheless, such positions (what Huws calls “process” knowledge workers) are frequently privileged via a closed labour market and a clear career path within the given specialty or organization, privileges not available to those without the necessary credential or professional certificate.

A major ideological cleavage exists between those in the private and public sectors. Those who profit directly and indirectly from the wealth generated by the capitalist system—most lawyers, accountants, business analysts, engineers, and IT workers—are more likely oriented to rational principles and the economic status quo than those employed by the state—often in social, educational and health fields. As the findings in Appendix G show, specialists are predominantly in the public sector (due
mainly to the high number of nurses and educators) while managers and supervisors are more likely to be in the private sector.

Another major cleavage identified in my study includes the divide between those specialist and managerial occupations that have achieved some level of occupational closure and those that haven’t. Somewhat predictably, my comparison of engineers and IT workers suggests that conflict tends to be more intense where closure by specialists hasn’t been achieved (e.g., engineers’ rather collegial relationship with management versus the experiences of many IT workers). This difference is amplified and crosscut by the nature of work, as between jobs that can be distributed (performed at a distance) and those that demand physical presence. The issue of “medium” and “object of labour” relates to both inter-specialist difference and intra-specialist difference. A further layer of complexity exists for those whose labour is conducted around or through information technology, relating directly to the extent to which the hard- and software they use has matured (i.e., uncertainty has been reduced, change tends to be incremental, and broad standards exist and are well established in organizations).

I earlier traced how the working conditions of the IT workers I spoke with fit quite well with a notion of bureaucracy that is both enabling and coercive, and they are similar in this way to engineers. But many also spoke forcefully about increasing precariousness in the face of offshoring, the uneven consequences of maturing IT for their field and, in contrast to engineers, the relative lack of control over the context of their work. In particular, Cynthia talked about the highly prescribed nature of IT work within the corporate environment, and the supportive role that she and many others play to more elite R&D units. While her job demands new skills, externally set deadlines around narrow tasks mean there is little time for creative activity related to new
products or processes. Neither does she enjoy support to initiate trans-departmental collaboration. These are decisions she and her co-workers understand are beyond them, with overall conceptualization of the labour process made by others in more senior positions. In this sense, Cynthia is significantly deskilled as her capacity to shape the entire labour process she is a part of is repressed. Her conceptual work is highly circumscribed and her job is primarily to execute routine maintenance and problem-solving, even if this routine work takes significant theoretical knowledge and she is largely "trusted" to carry it out. The workflow software described by Cynthia, Henry, and Vlad is staggering in size and scope in the way it is implemented by major IT sector companies, increasing numbers of governmental organizations, and many other organizations in a variety of sectors looking for efficiency through better control over the information and knowledge upon which (centralized) decisions can be made.

Income data largely support the notion of growing heterogeneity and cleavages among specialists and managers. While an education premium certainly exists, one study (C. H. Kim & Sakamoto, 2008) found that greater formal education levels are usually associated with increased deviation from an occupation’s mean income. Other data (Bakija, Cole, & Heim, 2010) suggest that managers’ median salary is much higher than the median wage of most specialists occupations (doctors and some other closed professions are similar to managers). This study didn’t, however, exclude professionals who were self-employed or owned a business with employees, thereby conflating class relations). A major US study (Weeden, Kim, Di Carlo, & Grusky, 2007) on income and class, using U.S. wage and salary earners only (and not professional owners), found that inequality has grown between specialist occupations, and, less so, within specific specialist occupations. Intra-occupational variation continues, however, to explain most
of the variance in income. But the study also found that income inequality has grown between specialist and managerial occupations, aggregated together, and the working class, and that this inequality has grown much faster than inequality between or within specialist and managerial occupations. Such a finding provides a useful transition point back to the debate over the existence or non-existence of a new knowledge class.

**Argument for a Distinct Middle Class**

I concede that the upgrading-via-socialization thesis is accurate in the short-term (the last half-century, say) and in the Canadian context, and that many specialists and managers are becoming less distinct from other workers and, as a group, are becoming more heterogeneous. These are important trends that must be accounted for, as I have tried to do above. But I argue such trends may not continue, and that arguments against the current and ongoing distinctiveness of a middle class are insensitive to the real and durable divisions in the separation of conception from execution. *The optimistic knowledge class theses of Bell, Florida, Reich and others largely ignore the agency of capitalists (and the senior managers to whom they delegate power) to find ways to retain control and increase profit. The optimistic socialization/upgrading theses recognize the power the capitalist elite has to restructure the labour process but largely ignore the very real agency that many specialist employees and managers possess through mechanisms of occupational closure, asset specificity, and control over productive resources.* This was an important and central finding of my qualitative research. Support for this claim is apparent in the quantitative data, even amidst the good-news upgrading story. Many specialists and managers in Canada are able to resist changes in the division of labour, their agency built on the exploitation of large swathes of the working population.
I argue that my findings, despite socialization and significant heterogeneity, suggest the ongoing existence of a specialist-and-managerial class (SMC) in Canada. I argue below that the occupations associated with such a class are different from both the working class (in the division of labour and in its relationship to capital) and the capitalist elite (in its lack of ownership or possession of the means of production). Managerial and specialist occupations also, simultaneously, take on attributes, conditions, and interests of both the working class and the bourgeoisie. They are exploited as a group (even if some individual members are compensated in ways that would seem counter-intuitive to call exploitative). As waged labour, and as the review of the findings in relation to the socialization/upgrading thesis made evident, increasing numbers of the SMC are subject to many of the same strategies that organizations use to maximize effort and minimize wage among the working class. But they also exploit those in the working class; their privileged material conditions (even when framed in terms of the public trust) are based on the exclusion and deprivation of the working class. Many specialists have achieved occupational and/or credential closure and managers are rewarded (many handsomely) for wielding organizational assets in a way that maximizes valorization, often through the exclusion and subordination of the working class. This is especially true if we think of the working class as a global entity, and the work of specialists and managers in the “global North” who design and coordinate international supply chains that depend on totalitarian governments and repressive employers in places like China.

**Justification for locating specialists and managers in the same class.**

A theoretical and empirical case can and has been made to separate managers from specialists (e.g., Clement & Myles, 1994), and conflict over advancement and effort
between managers and specialists must be recognized. I aggregate them in the SMC, however, based on both the quantitative data (similar levels of job complexity and discretion and similar difference to the working class, despite gains among this latter class) and the qualitative data (e.g., performance of conceptual/planning roles and tasks within the division of labour, and a shared interest in maintaining this division). It is the very nature of many specialist occupations to plan and design, and to give up this role would be to effectively end the function on which their privilege depends. The same interest in maintaining the division of labour exists for many managers. Where workers self-govern and plan, managers might have some role but certainly would have lost a major functional and relational justification for their disciplinary and coordinative role(s), and the relatively high wage that comes with such roles. I argue below that there is another reason to place managers and specialists in a distinct class: the power and growth of both is intimately connected to the maturing of digital technology, to ongoing and likely increased institutional and societal complexity, and to the continued cultural and political commitment to rationality and bureaucracy.

In Chapter One I described the historical struggle for professionalization by doctors, lawyers, psychiatrists, educators, engineers and others. Some, like engineers, did not achieve the same level of closure and collective bargaining but were successful, via legislation and certification, in establishing fairly rigid boundaries in the division of labour via Scientific Management and other labour process planning initiatives. There was and is nothing natural about closure – it was struggle for power where opportunity presented itself. Some gained opportunity for closure via growth in the size and technological intensity of capitalist firms. Others gained opportunities with the expansion of the welfare state. But nearly all specialists capitalized on the growth in the
demand for scientific knowledge and technical expertise. Opportunity to gain power and privilege may have been determined by science, the state and capitalism, but the social “structures” were built by the effective action of interested individuals and groups (Stark, 1980). While the historical liberal-professional project has often been wrapped up with claims regarding protection of the public good and the need for self-governance (often legitimate claims in the face of profit-oriented businesses, cost-cutting governments, or unscrupulous individuals), there can be no doubt that a key part was also the ability to exclude others and gain control over a body of knowledge such that competition was restricted and members were able to garner additional rent. Others specialists not fully professionalized have found themselves able to demand significant rent and/or power via market mechanism of skill scarcity, the latter based on credentialism, legitimate shortages, or unique talents in open labour markets. IT workers’ ability to exclude other workers is much more limited than engineers, as my interviews made clear. There are legitimate shortages that emerge around specific skills, though these are unlikely to last long except where advanced theoretical knowledge necessary and training program cannot respond quickly. Credential barriers are usually more fully developed within large, bureaucratic organizations; the shift toward employment in large organizations among IT workers suggests that credential barriers may grow in this “organizational” profession.

Despite gains by the working class in complexity, autonomy-control and involvement, there remain visible gaps in the data between specialists and managers, on the one hand, and the working class, on the other. As I noted earlier, how this gap should be interpreted, particularly in light of the large gains by the working class, demands further research. My findings show that even where specialists are drawn into
more complex interdependencies with other workers, many appear to be retaining access to more complex work under conditions of relatively high autonomy-control and involvement. A recent push in research on professionals and their work in large organizations suggest, in fact, that groups like doctors, accountants, and lawyers are resisting socialization. Some are losing independence as they move to the role of employee, but others are finding ways within bureaucracy to reassert collective control over traditional and new activities using both informal and formal means (Suddaby & Viale, 2011).

The introduction of IT into labour processes has, as detailed in the literature review and the findings sections, dramatically impacted organizations and the types of jobs and job markets available. Entire occupations have been nearly wiped off the NOC map (e.g., secretaries). Clearly, some of the statistical gains in job control and involvement among the working class are attributable to the automation or outsourcing of those jobs that were most routine and could be automated (e.g., skill-biased technology). This composition effect is most glaring as it applies to the service sector that, according to WALL data, has shrunk significantly since the 1983 CCS survey (Livingstone & Scholtz, 2007). We must remember, too, that almost half of those in the working class enjoy few opportunities for discretionary activity and nearly two-thirds have no say in organizational decisions. Indeed, much of the autonomy-control gains among service and industrial employees are in the “provide advice” and “subject to approval” categories. Concerning autonomy, and as noted earlier in this chapter, it isn’t clear if the discretionary opportunities relate to narrow tasks or to decisions in routine social encounters (think of emotional labour in the hospitality industry). Growing
underemployment among the working class, despite seemingly massive gains in complexity, autonomy and involvement, could conceivably expand.

At the same time, as the earlier material on the socialization of specialists and managers’ work suggests, the quest for greater efficiency and competitive advantage is dismantling rigid divisions of labour. There clearly has been a trend to depend more on the knowledge and problem-solving capacity of the working class to improve labour processes, even as work becomes more precarious and labour market pressures work to discipline those with jobs. It is not clear, however, to what extent the increases in complexity, discretion and involvement are due to the immaturity of both information technology and management’s ability to understand and shape such technology, and if a cyclical trend toward detailed routinization might (re)appear among those in the working class who have made legitimate gains in autonomy-control and involvement.

Vlad and Henry both describe designing systems for internal and external clients that have the capacity to routinize if not automate ever more complex human activity. Just as early 20th century engineers implementing principles of scientific management recognized and culled the knowledge of manufacturing workers via precise qualitative and quantitative study (see Sawchuk, 2010), contemporary software builders study the work of many occupations that once were immune to rationalization. Reports from case studies in law (Burk & McGowan, 2010; Trosow, 2004), business planning (Eriksson-Zetterquist, Lindberg, & Styhre, 2009), auditing (Axelsen, 2011), and even medicine (Hoff, 2011) indicate the penetration of workflow software that, where feasible, breaks apart tasks and decreases the cognitive requirements and opportunities for job control. But, while specialists may have something to fear—and I am stating the obvious and the tautological—routinizing technology will find its way into more routine jobs first. That
is, many of those in service and industrial positions who have so far withstood automation or outsourcing may experience simplification of their work as managers and specialist occupations reassert their power *where they can* and *how they can*.

Such agential motivations are accompanied by structural reasons suggesting that organizations may not just tolerate the SMC but encourage it. Certainly, some specialist labour is standardized and tasks can be moved through a geographically dispersed labour flow (e.g., a fair numbers of IT jobs); many other specialist and managerial jobs, however, depend on and gain experiential, organizationally recognized “asset specificity.” As discussed in Chapter Three, asset specificity refers to a situation where a worker’s knowledge is specific to a given organization or activity, and thus is specialized. This can apply to workers in any job, but tends to apply mostly to specialists and managers. Out of such specificity emerges the opportunity for composite rents (Sørensen, 2000a), where there is a mutual gain for both worker and employer to perpetuate an employment contract. While employers may seek to increase their share of the rent, largely through oversight and/or predictability, organizational and labour process researchers have provided ample theoretical and empirical evidence that not all jobs lend themselves to routinization and centralized decision-making. In such cases, and especially where labour market competition is restricted through occupational closure or credential norms, sustaining a composite rent makes sense for the employer. Historically, as described in the literature review (e.g., Clement & Myles, 1994), such a situation is most frequently associated with specialist and managerial occupations: work is cognitive, frequently conceptual, not easily monitored (at least yet), and demands significant interpretation and analysis based on complex bodies of knowledge. Such work *at this time* demands winning consent, offering financial and non-monetary
incentives, and fostering workplace cultures that builds a sense of community and shared goals. It was this divide that Braverman pointed to when outlining the separation of conception and execution, where employers were willing to increase some groups’ power, job complexity and share of the composite rent in order to reduce other groups’ skill requirements and claim to any rent at all. It is largely the same divide that Randall Collins drew attention to in his work on credentialism and the division of labour.

More and more service and industrial workers, though not yet near a majority, are gaining access to conditions of employment similar to the SMC. Simultaneously, however, specificity or scarcity through closure—and especially specificity with closure—creates disincentives in many cases for management to meddle with the overall division of labour. Sometimes it is preferable (or easier) to maintain a relatively small cadre of employees (managers and specialists) to maximize capital growth or, in the case of public organizations, minimize costs. My findings suggest that creativity and democratic decision-making are messy, time-intensive, and often unpredictable. Think about Robert’s description of project inertia that occurred when engineers were left to work out details in a democratic manner. Think, too, about the rigid division in the mine where Trevor managed safety issues: the engineers remained separate and privileged both in terms of physical location and activities. Such activities demand trust and broad incentives to act in the interests of the organization. Allowing some participation in decision-making and problem-solving for the working class is both necessary and
advantageous, and fits the socialization thesis, but much of this, I suspect, largely occurs in processes, on products, and within timeframes decided by managers and specialists. Doctors, engineers, programmers, teachers, accountants, and other specialists, even as employees in bureaucratic settings, still largely retain access to key operational and strategic decision-making in ways the working class usually does not.

Conclusion: Adjudicating Among the New Class Theses

In the Canadian context, my findings directly challenge theories of a knowledge class that is posited to be as or more powerful than the capitalist elite (pace Bell and Florida). The findings suggest that the social relations of production in Canada remain deeply structured by ownership, exploitation, and struggles over labour effort under conditions of an indeterminate employment contract. The privilege of specialists and managers is being challenged but the boundaries excluding and subordinating the working class (via closure and bureaucracy) remain, for the most part, durable and robust.

My findings suggest convergence and divergence with a number of the knowledge class (KC) theses. Theses welcoming a powerful, dominant, socially progressive KC are useful for capturing the rapidly growing importance of techno-scientific knowledge and advanced analytical capacity; such theories, however, marginalize the agency of the capitalist elite to retain overall control through negotiation, delegation, political influence, relatively high wages, incentives (e.g., stocks), career paths, and benefits. Those promoting an undesirable emergence of a

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150 See “Future Research” in the Conclusion chapter where I describe the need for further comparative, multi-methods research on the relationship among managers, specialists, and other employees.
dominant new class that exploits workers capture one of the key motivations for closure by specialists and managers, and draw out the way in which exploitation can exist within capitalism by mechanisms other than the ownership of the means of production and rights to appropriate profit. They miss, however, the particular nature of exploitation in the capitalist mode of production and thus, like those welcoming a dominant KC, marginalize the durability of ownership and capital as the key axis of power. Of the stuck-in-the-middle new class theses, my hypothesis is aligned quite closely with Wright’s theory of contradictory class locations, which proposes that identifiable boundaries around a new class cannot be justified theoretically or empirically.

Based on my research, Wright has accurately captured the paradoxical interests facing those in specialist and managerial occupations, and the fact that control over skills and “organizational assets” (i.e., the right to engage in coordinative activity) are simultaneously protective measures against exploitation and mechanisms of exploitation. He also captures, though he does not emphasize, the socialization that tears at the division of labour in which specialists and managers are privileged. My findings also suggest, however, Wright has not recognized fully enough the distinctiveness of specialists and managers in the social relations of production. Admittedly, boundaries are tested by employers’ efforts to maximize profit through greater control and the use of lower paid labour. In contrast to Wright’s work denying identifiable boundaries, I argue specialists and managers are relationally distinct and large numbers cluster (statistically speaking) in work that offers high autonomy-control and involvement in organizational decisions. More importantly, their autonomy-control and involvement is related to designing and coordinating the tools and procedures of
labour processes. In contrast, while discretion and involvement have risen among working class occupations, such gains have seemingly been oriented to tasks focused on the making or completion of services and commodities. Put another way, and picking up in a direct way on many of Braverman’s concerns and claims, conception is still largely divorced from execution with regards to control of the entire labour process, even if specialist occupations are not decreasing as a percentage of the labour force as Braverman expected. My conclusion, then, is that the ability to exclude (achieved via occupational closure, credentialism, bureaucratic hierarchy, or a combination) is durable among specialists and managers, creating conditions for their ongoing ability to claim rent at the expense of the working class.

I proposed, based on my research, a specialist-and-managerial class (SMC). While I might quibble with various details of other theories proposing a similar class, the SMC as it exists in Canada has much in common with a variety of new middle class models proposed by such theorists as Giddens, the Ehrenreichs, and, to a lesser extent, Goldthorpe. The primary difference is that I explicitly link the middle class with exploitation as the criterion distinguishing its admittedly fuzzy boundaries. In exploring how it is exploited, and why it exploits the working class and how, my analysis links more directly to the other middle class theories. The SMC, as argued convincingly by the Ehrenreichs, has thrived under capitalist social relations, and many “function” to extend the power of the capitalist elite (e.g., lawyers, engineers, and IT workers) and to reproduce the “actually existing” capitalist system through preparing individuals to be workers (e.g., educators) or mitigating the social consequences of inequality and an inherently volatile labour market (e.g., policy analysts, social workers).
The class location of technical workers like engineers and, more recently, IT workers has created difficulties for class analysts. One major issue has been differences in theoretical models. Another has been variation across jurisdictions. Another has been intra-occupational heterogeneity. In the context of class relations in Canada, engineers and IT workers remain problematic and their association with the proposed SMC comes with numerous caveats. Many in both occupations “function” to maintain and develop the physical and digital infrastructure that private organizations depend on to control the labour process, reduce labour costs, and thus maximize profit. But the great majority of both are also workers, depending on salaries (and sometimes hourly wages) to survive. Compared with IT workers, engineers in Canada more easily fit within the model of a class that links specialized labour and managerial occupations. The P.Eng designation provides a durable mechanism of closure for many engineers that links them in a fairly direct way with other professions that have achieved closure. As the engineers I spoke with made clear, many saw engineering as part of a continuum with management, their project management as engineers a natural stepping stone into more senior managerial roles. Yet, as my findings and the literature suggest, a substantial proportion of engineers (with and without their P.Eng) are embedded within traditional bureaucratic structures and centrally controlled labour processes that change their relationship with management, technologists, and the working class. A much larger proportion of IT workers hang at the SMC-working class boundaries, though many remain firmly within the class – protected by specific knowledge, credential barriers enhanced by formalized HR hiring practices, and scarcity of certain advanced IT-related skills.
My study of engineers and IT workers suggests that attempts to identify the SMC—or any other variant of a middle class that includes specialists—by occupational group needs to be sensitive to differences within such groups. But, at the same time, attention to intra-occupational heterogeneity in the labour process can’t be allowed to overshadow the relationships that emerge out of the division of labour or, most importantly, the capitalist social relations of production. Engineers, IT workers, and other specialists and managers are in a deeply contradictory class position, functioning both as capital and labour but simultaneously staking out a defensive position between the two. As suggested by Bell, the rationality to which most of the SMC is oriented is potentially antagonistic to the boom-and-bust cycles and labour conflict inherent to capitalism. Indeed, patterns of knowledge control, authority and central coordination of collective activities are trans-modal, as suggested by Dahrendorf, Wright, and Giddens who examine authority- and expertise-based class structures in socialist countries. But my findings suggest that the SMC is largely integrated into and conservative in their orientation to capitalism; the primary conflict (so far) between the SMC and the capitalist elite is around job control and the division of labour that impact on the power of specialists and managers to make claims for compensation. The struggle therefore remains intra-systemic and continuity dominates the story.
Conclusion

Introduction

In this dissertation I have taken particular and sustained aim at theories that a knowledge class has assumed dominance within the social relations of production. The bases for such claims are: rising levels of formal education; organizations’ need for specialized knowledge to compete in increasingly global markets; skill-biased technology; high wages associated with education; and compositional changes where specialist occupations have been expanding quickly. The consequences for specialists are claimed to be the emergence of post-bureaucratic forms of organization, self-management, rising autonomy-control over specific tasks, and significant individual and collective control over operational decisions and, increasingly, strategic planning. In most versions of the optimistic knowledge class theses, knowledge is equal to or more critical than capital as a factor in organizational success and as a basis for socio-economic power (e.g., Bell, Florida, and Reich). Some go so far as to propose the emergence of a post-capitalist society where the knowledge class has assumed control (e.g., Drucker). Other “new” class camps offer competing, more critical perspectives but often, like the optimistic knowledge class theorists, depend on indirect proxies to draw conclusions on the activity of specialists and managers and the division of labour more generally.
In the literature review I traced foundational work on the possibility for and emergence of a distinct new class via the theoretical work of Marx and Weber, then presented evidence of both change and continuity in science, the occupational structure, and organizational strategies through the 20\textsuperscript{th} and early 21\textsuperscript{st} century. Along the way I attempted to historically situate the various new class theories, with emphasis on the continuity within various theoretical positions. Alternative, competing perspectives hold that: a distinctive and dominant new class has emerged but exploits the working class (e.g., Derber); specialist occupations are at the leading edge of the working class (e.g., Mallet); a new class has emerged that is subordinate to the capitalist elite but subordinates the working class (e.g., the Ehrenrechs, Goldthorpe, and Giddens); and specialist and managerial occupations form a collection of class fractions in contradictory locations that defy the drawing of clear conceptual and theoretical boundaries (e.g., Wright). Virtually all theorists in all camps study class as a phenomenon that involves the division of labour among the employed: what one does defines one’s class location.

Conceptually, I argue this labour process approach is not just defensible but necessary. A two-class model is appropriate if one is concerned with broad historical trends in the development of the capitalist mode of production but is not as useful for understanding class relationships and struggle in a given social formation like Canada as it enters the 21\textsuperscript{st} century. I propose, however, that realist approaches to class that focus on disposition and consciousness miss the point that a class structure can exist and be identified absent of overt class-consciousness and/or action. My theoretical starting point for assessing knowledge class theories retains a focus on exploitation as the key element, but in a neo- or even post-Marxist form that disconnects it from the
labour theory of value and instead focuses on the dependence of one group on the material deprivation of another group. In this way, following Erik Olin Wright, exploitation is potentially applicable to relations amongst employees where structural, durable features like closure and exclusion from organizational decisions (somewhat akin to Wright’s “skill assets” and “organizational assets,” respectively) allow some groups like specialists and managers to exploit those in the working class. I argue further that to understand “real” subordination, and to evaluate if closure and bureaucratic control are creating exploitative relations amongst employees, sustained attention needs to be paid to the labour process (LP). By labour process I mean job complexity, task-level autonomy, organizational form and managerial strategies, technological change, and labour market factors related to professional closure and credentialism. I theorize that, in studying the division of labour, notions of deskilling or upskilling can’t be limited to issues of job complexity and autonomy; rather, for a worker to use the full scope of their capacity they need to be involved in planning operational matters. In the binary between conception and execution, this suggests an expansive and holistic approach to conception that I argue better connects to Marx and Braverman’s critique of the fragmentation and routinization of work. Where a worker has little involvement in organizational decisions, even if they enjoy substantial autonomy over their specific task, their conceptual activity is narrow and partial.

I hypothesized that an increasing percentage of specialists and managers are vulnerable to the routinizing and centralizing tendencies that impact other employees, and that specialists are growing increasingly heterogeneous, both intra-occupationally and inter-occupationally. As such, class boundaries between the capitalist elite and senior managers/top specialists, on the one hand, and specialists/managers and the
working class, on the other, are too empirically indistinct to make any defensible claim about a distinctive class. To support or disprove this thesis, and to bolster my critique of many new class theorists’ indirect proxies, I argued the merits of a methodological approach to class analysis that examined the labour process in as direct and full a way as possible via multi-method triangulation. To this end, I used comparable questions on education, skill, job control and organizational features from a 1983, nationally representative survey and compared this with a 2004 survey that is also representative. My qualitative data came from interviews with engineers and information technology (IT) workers. They were chosen for the particular and important ways the two occupations converge and diverge. Both have been at the centre of LP restructuring, depend on similar mastery of complex technical knowledge, and are archetypal “knowledge workers” in the literature, but are different in historical patterns of occupational closure and in their relationship to technology (i.e., engineers tend to work on technology, IT workers tend to work through technology).

Summary of Findings and Argument

Organization, Skill and the Division of Labour

My findings suggest that knowledge-requirements are rising for specialists and managers, as they are for all workers. Yet, where those in service and industrial jobs are experiencing higher autonomy-control than those in similar jobs a few decades ago, managers and specialists report lower levels. Evidence from my study suggests that employers are using a range of traditional, industrial, and hybrid strategies to increase the productivity of specialized workers and managers, and to achieve greater flexibility to respond to market (private) or funding (public) changes. In some cases, where the labour process can be distributed and the labour market is fairly open (e.g., IT workers),
classic industrial strategies of knowledge centralization, routinization, fragmentation, externally set deadlines and close surveillance are growing. As well, many IT workers are facing the paradox of rising demand and rising precariousness (e.g., outsourcing, offshoring, downsourcing). Moreover, they are starting to more frequently apply their rationalizing gaze upon each other (as described by Vlad, a programmer). Even for specialists who have achieved a greater degree of closure there are ongoing, albeit uneven, efforts to increase efficiency through standardization, monitoring, and offshoring; here, though, right-to-practice certification and the location-dependent nature of their work (e.g., educators, doctors, and many engineers) dramatically reduces vulnerability.

The result has been overall but uneven declining autonomy-control for classic professionals, (semi-professional) specialists and managers. But, at the same time as organizations seek greater control, the rising complexity (i.e., knowledge invested in processes, services and commodities; global supply chains; informational feedback about users and consumers) is demanding greater input and cooperation among all employees in order to speed reaction to market/technological change and thereby gain competitive advantage. Many specialists and managers are experiencing an odd contradiction that defies most new class theorizing: they are experiencing significant increases in involvement in organizational decision-making even as levels of autonomy-control decline.

I found these contradictory trends best explained (and predicted) by a particular, structural reading of Marx’s theory of the rising contradiction between the forces and social relations of production. Promoted by autonomist Marxists (emphasizing agency but actually retaining significant appeal to structural causes) and
“paleo-Marxists” (i.e., Paul Adler), this theory predicts the autonomy-involvement contradiction facing specialists and managers. These theorists propose that the rising complexity of labour processes is demanding greater interdependence and collaboration as more and more employees are expected to participate in planning and design activities.

I argued, however, that the directionality of change should not obscure significant and ongoing boundaries. Quantitative measures of involvement in organizational decision-making show there are still massive differences between managers and specialists, on the one hand, and the working class, on the other. Even measures of autonomy, while indicating some convergence, suggest substantial difference persists and it is not clear if the autonomy-control gains reported by the working class relate to problem solving as members “execute” narrow and/or highly prescribed tasks. One of the primary problems with the socialization-as-interdependence-and-upgrading thesis is that it marginalizes the agency of those who hold specialized knowledge to maintain or enhance activity-boundaries that exclude other workers from practicing in their domain.

As evidence on engineers and, to an extent, IT workers suggests, closure is particularly durable. Classic strategies to solve the “principal-agent problem” among specialists and managers continue to dominate, including: loyalty rent/salary, internal career ladders, greater autonomy and involvement in decision-making, and collegial decision-making. There is growing heterogeneity between and, more so, within specialist occupations. Concerning managers, the socialization thesis ignores the durability of bureaucracy as the most efficient means for controlling large and/or geographically dispersed labour processes. Hierarchy is bending (resulting in
“enabling” bureaucracy for some and decreasing the autonomy of some managers) but it is still the dominant form of organization. Findings from interviews with IT workers and the survey data suggest the role of managers, even where delayering occurs, is a vital “function” within all sorts of organizations in Canada, including knowledge-intensive ones. With growing complexity in labour processes, commodities, and markets, and where profit margins are slim and efforts to increase productivity among all workers is rising, the coordinative need for managers is more likely to increase than decrease.

**A contradictory, specialist-and-managerial class.**

The specialist-and-managerial class (SMC) I argue for is distinct from the working class in its dominance over administration and conceptual labour but is, simultaneously, internally fragmented. Its boundaries are less distinct than in the past, and it is under pressure from the capitalist elite pursuing valorization through socialization and/or increased exploitation. The SMC is also under pressure from a working class that is increasingly involved in productive and organizational decisions, and who are capable and frequently desirous of much more involvement in tasks and roles previously or currently restricted to specialists or managers. The same sophistication of knowledge and technology that has made the SMC more valuable is simultaneously breaking down knowledge barriers, opening the SMC—particularly specialists who work through technology and aren’t protected by closure—to routinization and automation. While there can be no doubt that information technology has set off a massive demystification of expert knowledge and allowed new forms and intensity of informal learning, those non-specialists who are able to acquire and master specialized bodies of knowledge continue to face credential and right-to-practice
barriers. The SMC broadly retains its privilege in the traditional division of conception
and execution, and managers' coordinative, supervisory, and surveillance roles become
more important, not less, in transnational, complex labour processes where tasks have
been fragmented.

The contradiction between the forces and relations of production is occurring in
a capitalist system that was made by and continues to be permeated by class struggle.
Just as capitalism is a historical, jurisdictionally varied project, so too are managerial
and specialist privilege. The technological and social development of the capitalist
industrial system was intensely political and will continue to be so. In emphasizing
growth and profit in the face of increasingly sophisticated knowledge and technology,
the system sets imperatives of rational organization. It develops a tendency toward a
division of labour where a minority of employees make "key" decisions and the majority
experience uneven conditions of work complexity, control-autonomy and participation
in organization decisions. Inverting the determinism inherent in both the socialization
thesis and the knowledge-class-as-dominant thesis, new technology and markets may
disrupt traditional industrial patterns but, ultimately, those groups most powerful in
capitalism will attempt and often succeed in bending, transforming and reengaging
strategies of control, valorization and closure.

Limitations and Future Research

It might seem like a lot of effort to arrive at a fairly well trod class structure
(albeit with some important differences in the mechanisms that form the class
relationships among the employed). I argue, however, that the long path is exactly the
To make any assessment of the class structure in Canada, its dynamism (or lack thereof), and its likely trajectory, research must engage as fully as possible and with as many direct measures as can be collected about what specialist and managers do, and the organizational and labour market context in which they perform their work. The conclusions that I have drawn about the existence, membership, durability and transformative potential of specialists and managers are, I believe, on a sounder empirical footing than the many class theories that are supported by: theory alone, distant proxies, or even indirect measures. This is certainly not to claim this study exhausted the potential questions that could shed insight on class relations, or wouldn’t have been strengthened by using other methods or data sources. All research is, of course, about choices, and I turn now to some of the shortcomings of my study and further research suggested by these shortcomings.

**Limitations**

I perceive a few minor and two major shortcomings in my research. The minor limitations include insufficient attention to variation within the managerial ranks. I deal with this variation in places throughout the dissertation but the focus is obviously on specialists and specialist managers. As well, alternatives to the current division of labour are dealt with only in a suggestive way. What a more egalitarian distribution of theoretical knowledge, specialized labour, and managerial activity would mean for the education system, political decision-making, the structure of private enterprises, and so on is important but largely unexplored within this project.

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151 Wright (2000) notes the joke that “the definition of sociology [is] the painful elaboration of the obvious” (p. 1562).
Of the major limitations, the first relates to data sources I used, the second to methods I didn’t use. My quantitative data relies primarily on the Canadian Class Structure (CCS) survey and the Work and Lifelong Learning (WALL) survey. The two surveys have overlapping but not identical research questions and emphases. The CCS survey included many more questions directly applicable to the research questions that fueled this dissertation. If I had access to responses for the same questions on a more recent survey I would have been able to delve more deeply into quantitative data on authority, autonomy-control and, more so, involvement in organizational decision-making. As the saying goes, beggars can’t be choosers and using secondary sources will almost always result in compromise. That said, based on the high cost and labour-intensive nature of surveys I feel lucky to have had access to these carefully crafted, technically sound, and conceptually connected surveys. In the analysis of the data itself, I realize that my work will appear crude and laborious to someone with more statistical training. But, as I explained in Chapter Five, part of my goal was to make the data easily understandable and meaningful to non-statisticians (like myself). Most likely an approach that presents data both ways—through simple cross tabulations and the correlations, on the one hand, and multivariate analysis, on the other—is the most powerful.

My interest in the existence and power of a knowledge class began with a strong emphasis on the relationship among the capitalist elite, managers, and specialists. This relationship was central to my core research question and the topic around which much of my literature review and analysis focused. However, in the course of delving into the labour process my analysis grew to include substantial attention to the relationship among managers, specialists and the working class. This could, potentially, be seen as a
diversion from my core research question but seems to me to be an important issue for understanding the location and interests of specialists and managers. Concerning any of these class relations, an examination of “lived” class relations in organizations would have, I believe, been enriched by a focus on a few organizations where I could have conducted small-scale surveys and, especially, participated in ethnographic study of the day-to-day relations among owners/corporate executives, mid- and lower-level managers, specialists and the working class. Such a source of data would have offered yet another vantage point in the pursuit of triangulation, and would have provided much more concrete evidence on the ways in which non-specialists and non-managers are infringing (or not) on the tasks and roles traditionally associated with specialists and managers.

**Future Research**

A number of avenues of future research are directly implied by the identified shortcomings. I believe it would be useful to conduct a nationally representative survey linking explicitly to more of the class-related questions in the CCS survey in order to gain a deeper understanding of broad trends in the types and levels of involvement of employees in organizational decision-making. It would also be important to conduct organization-specific research. Both preceding (to help inform the construction of the nationally representative survey) and following (to investigate in more depth the survey results), organization-specific surveys and ethnographic study of labour processes would allow a much more focused, nuanced understanding of the boundaries that advantage specialists and managers, and the extent to which members of the working class are taking on specialist and manager tasks.
Throughout this study I identified a range of issues for further research, many of which could be pursued in the research project described above or pursued in separate studies. First, I identified the need for comparative study of specialists in large bureaucracies with particular emphasis on a) emerging divisions of labour within given occupations and b) detailed investigation of “expert” systems that computerize specialist’s decisions that have hitherto been based on “professional” judgment. Second, I found that I was unable to adequately explain, based on my findings or a search of the literature, why engineers in the public sector would enjoy more involvement in organizational decision-making. I speculate the phenomenon: a) might have something to do with the type of engineering common to the public sector (i.e., higher status civil engineering that is often oriented to large infrastructure projects); and/or b) might relate to valorization pressures in the private sector where there are more engineers in large bureaucracies involved in maintaining complex productive systems. Third, I found the issue of down-sourcing and super-users particularly intriguing and demanding further exploration, though identifying this phenomenon and such individuals in a quantitative approach will be challenging. Fourth, the findings on increasing autonomy and involvement for the working class demands substantial attention. Are such gains reflective of genuine transformations, are they human resource strategies to gain consent but in reality largely cosmetic, or an uneven combination? Even if such gains tend to be genuine and many in the working class are participating in conceptual design and organizational planning, to what extent will the overall specialist/non-specialist division of labour be altered and will the working class be in a position to make claims for greater autonomy, involvement, and wage?
Fifth, on the issue of financial compensation, I had difficulty tracking down recent studies relating to class and wage. As Myles (2003) notes, it appears that sociologists have largely stepped away from the study of how class relates to wages. Recent studies tend not to examine class in a neo-Marxist way, or in a way that is sensitive to structural differences like closure or managerial role (i.e., control of organizational assets). While I lack the statistical training to engage in this debate in a very sophisticated way, at least at this time, it is an important issue and is a measure of the relevancy of class analysis for understanding inequality. While the recent Occupy movement was largely silent on the issue of class, the growing gap between the “one percent” and the rest draws attention back to the issue of exploitation and gives me pause regarding my own conclusions about a specialist-and-managerial class (SMC). In class analysis the tendency (and I am guilty of this to an extent) is to take an ordinal approach to the class structure (i.e., the capitalist elite, then the SMC, then the working class). But the massive income inequality between a tiny minority and the rest of the population, with the SMC and the working class relatively close, suggests that, even if the SMC “exploits” the working class via exclusion, exploitation amongst workers is of a very different degree. Ownership or “possession” of the physical means of production, mostly in relationship to corporate activity, thus appears as a resilient and dominant source of exploitation of both the SMC and the working class. A study that integrated class, labour process issues and income has the potential to reinvigorate critical and,  

\[152\] Where class was discussed it tended to be treated dichotomously or with vague gestures toward income-based middle and working classes.
especially, Marxist critique. But this is speculative and waits for further theoretical and empirical work.

Sixth, the SMC is a preliminary venture into formulating a class structure, based on my theoretical starting point in combination with my empirical research. I remain open to further theoretical revision (as outlined in more detail in Chapter Five) and research that might indicate boundaries around the SMC are not as theoretically or empirically defensible as I claim in this thesis. It may be that managerial and specialist roles become so diverse that the occupation-based concept loses salience. Of particular interest to me is how rational, scientific approaches seem to be coming into increasing conflict with growth-oriented economic models promoted by mainstream economists and neoliberal politicians. Some specialists are part of counter-hegemonic groups and movements challenging current industrial practices, waste management regimes, oil transportation, and so on. These technical workers are notable for both their ability to articulate real alternative technologies and planning and their credential-based legitimacy. The impulse toward rational thought here has placed many in direct conflict with the capitalist elite; for example the ruling Conservative government in Canada is so distrustful of scientists and other technical specialists in the public service that it has effectively issued a gag order (Burgmann, 2012). The impact of a strong political right distrustful of science is a very interesting and important issue, democratically speaking, particularly if conflict with political decision-makers is impacting specialists’ political alliances and openness to overt political action and participation in social movements.

Finally, in relation to all of the issues identified above, and class structure more generally, theorizing would benefit enormously from further comparative empirical research in the spirit of the *Comparative Project on Class Structure and Class*
Consciousness. This international endeavor is the source of the 1983 Canadian Class Structure (CCS) survey from which I gathered much of my quantitative data, and which is extended by the 2004 Work and Lifelong Learning (WALL) survey. A robust, defensible critique of capitalism as a transnational mode of production and variation in class relations depends on such work.

Moving Forward

This study has for me raised as many questions about the class structure and about labour process issues as it has answered. I have, I believe, provided substantial evidence that specialists and managers are not dominant within an advanced capitalist country like Canada, and that ownership (and delegated strategic control of productive organizations) remains the fundamental axis of exploitation. Yet I continue to struggle with whether or not the investigation of boundaries around a knowledge class, a creative class, or a specialist-and-managerial class is important. For many critical researchers, the “new” class argument may be an anachronism and/or a red herring pulling attention away from the more pressing need to confront capitalism as an inherently exploitative, class-polarized system. The recent Occupy movement in Canada and the U.S. pointed in a very direct way to the massive and growing inequality between the capitalist elite and the rest of the population. But the analyses emerging from the Occupy movement are largely oriented to distribution (e.g., “We are the 99%”), with advocates having much less to say about class, the relations of production that are leading to such inequality, and important differences among the so-called 99%.

If the working class—whether conceptualized at the local, national, or international level—is to pursue emancipatory alternatives, my findings suggest its struggle will be on two fronts. As evidence from “actually existing” socialist nations
suggest, (nominal) collective ownership of the means of production doesn't necessarily mean that the mass of workers will have the opportunity to engage the full capacity of their intellect. The old Soviet Union and current totalitarian regime in China are prime examples. Managers and specialists can perpetuate the exploitation of the working class, just as they frequently do under capitalist relations. New technology opens possibilities for demystifying esoteric knowledge, new managerial theories and practices are socializing the labour process and dismantling some boundaries within the division of labour, and the acquisition of knowledge through formal and informal learning is expanding rapidly among those in the service and industrial sectors. But this project has raised serious questions about how far the socialization of knowledge can progress in the face of occupational closure and credentialism, phenomena that seriously and persistently limit the opportunity of non-specialists to gain experience in applying knowledge they may have or gain through informal learning, technology-enhanced communication, or an increasingly cooperative labour process. This is not a pessimistic vision of the potential for change; rather, it is the recognition of complexity in struggles for alternatives.
Appendices
Appendix A – Marx, Weber, and the New Class

The intent of this appendix is to provide material supporting my interpretation of Marx and Weber in Chapter Two.

Karl Marx.

For Marx, while exploitive relationships were nothing new, the intimate nature of coordination and surveillance with manufacturing was unique to the capitalist mode of production. An extended passage from Capital (1976), where Marx described the transition into and out of primitive accumulation, is worth citing to elucidate this relationship:

[T]he confrontation of, and the contact between, two very different kinds of commodity owners; on the one hand, the owners of money, means of production, means of subsistence, who are eager to valorize the sum of values they have appropriated by buying the labour-power of others; on the other hand, free workers, the sellers of their own non-labour power, and therefore the sellers of labour. Free workers, in the double sense that they neither form part of the means of production themselves, as would be the case with slaves, serfs, etc., nor do they own the means of production, as would be the case with self-employed peasant proprietors. The free workers are therefore free from, unencumbered by, any means of production of their own. With this polarization of the market for commodities, the fundamental conditions of capitalist production are given. The capitalist system presupposes the complete separation of the labourers from all property in the means by which they can realize their labour. As soon as capitalist production is once on its own legs, it not only maintains this separation, but reproduces it on a continually extending scale. The process, therefore, that clears the way for the capitalist system, can be none other than the process which takes away from the labourer the possession of his means of production; a process that transforms, on the one hand, the social means of subsistence and of production into capital, on the other, the immediate producers into wage labourers. (p. 874)

For Marx, then, the “use-value” of individuals’ labour is subordinated to its “exchange-value.” Within this nominally “free” exchange of labour as a commodity, Marx finds the concept that has so differentiated his work, and the work of Marxists since: exploitation. In Marx’s analysis, to put it plainly, labour is a “variable” capital while everything else
(buildings, machines, land, etc.) is “constant” capital. In other words, only labour can create additional value. A labourer produces value in the object of work (the commodity) after, say, five hours of work equivalent to his/her wage but continues to toil based on the labour agreement. The last three or four hours of work are work for the capitalist alone. In this way, and obscured by the indeterminancy of the employment contract, each labourer produces “surplus value” in a commodity. The surplus value is then realized as profit when the capitalist sells the commodity. To increase the surplus, and thereby their wealth, capitalists are impelled to increase the productivity of workers and/or reduce payroll costs.

Exploitation designates, then, an interdependent relationship around material interests. That is, the welfare of the exploiters depends on the material deprivation of the exploited, resulting in a “zero-sum” situation. One group must be deprived for the other to benefit. For this to happen, the exploited must be excluded from access to certain productive resources. In the context of capitalism, this exclusion is built around the privatized nature of control over property and wealth in a seemingly “free” market, and rights to profit from property and wealth guaranteed by the legal system (Mandel, 1990; Marx, 1990; Wright, 2005).

According to Marx’s analysis, the dependence of the capitalist class on the deprivation of workers for their material well-being would lead to intensified polarization between classes. The “petty bourgeoisie,” the small business owners that

153 Just as the employee is dependent on the employer for their wage, the capitalist is dependent upon employees to create surplus value that then can be turned into profit. This gives employees in the capitalist mode of production a level of power not enjoyed by subordinated classes in other modes (e.g., slavery, serfdom).
constituted the relatively small middle class at the time Marx was writing, he expected to be almost wholly subsumed by the expansion of capitalist enterprises and eventually disappear as a meaningful group in terms of political and economic power. In the factories, Marx saw an organization of production that allowed capitalists to bring labourers together under one roof, fragment jobs and knowledge within an increasingly simplified division of labour, and provide owners greater powers of surveillance and discipline (see D. Sayer, 1991).

The *technical division of labour* involves the separation of roles based on the nature of the task at hand. It is, in a sense, a technically determined division, whether "technical" refers to a task like building a house or to a large, multidivisional organization. Depending on the skills of those involved, jobs are divvied out. However, any discussion of the technical division of labour can only exist at the abstract level for, as Marx argued, decisions about who does what are always based on social relations and social relations are always impacted by power (see A. Sayer & Walker, 1992).

While at an apolitical level the *social division of labour* speaks merely to specialization within increasingly complex societies—as between a house builder, a midwife, and an accountant—within an organization these jobs and other "whole" jobs like weaving, manufacturing, or graphic design can be broken apart to make a process more efficient and/or to reduce the knowledge (and therefore the labour costs) necessary to perform the job. Marx identified the social division of labour as a historical

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154 It remains unclear if Marx considered civil servants among the petty bourgeoisie.
process, and emphasized the specific details with which various aspects of industrialsm had come into being (see Camfield, 2005).

Marx, with Engels, articulates the dynamic that emerges from the pursuit of labour simplification in *The Manifesto of the Communist Party* (1983):

> Our epoch, the epoch of the bourgeoisie, possesses, however, this distinct feature: it has simplified class antagonisms. Society as a whole is more and more splitting up into two great hostile camps, into two great classes directly facing each other -- bourgeoisie and proletariat. (p. 205)

And later:

> With the development of industry, the proletariat not only increases in number; it becomes concentrated in greater masses, its strength grows, and it feels that strength more. The various interests and conditions of life within the ranks of the proletariat are more and more equalized, in proportion as machinery obliterates all distinctions of labor, and nearly everywhere reduces wages to the same low level. The growing competition among the bourgeois, and the resulting commercial crises, make the wages of the workers ever more fluctuating. The increasing improvement of machinery, ever more rapidly developing, makes their livelihood more and more precarious; the collisions between individual workmen and individual bourgeois take more and more the character of collisions between two classes. (p. 211)

In the passages above we see the “logic” of capitalist accumulation, and are pointed to a key contradiction that weakens capitalism from the inside out: the contradiction between the *socialization of the forces of production* and the *privatized nature of accumulation* (Adler, 2011).

Capitalists’ desire for profit impels them to draw the working class along through “political and general education” which “furnishes the proletariat with weapons for fighting the bourgeoisie” (Marx & Engels, 1983, p. 214). The growth of capitalism leads to an ever expanding and self-aware working class. “With the development of industry the proletariat not only increases in number; it becomes concentrated in greater masses, its strength grows, and it feels that strength more”
(1983: 215). Even as machinery is used to erase differentiation amongst the majority of workers, then, employers are compelled to depend on more educated workers, and more and more of the human population is drawn into cooperative productive activity. Put another way, the productive capacity of workers, individually, and the potential of human labour, collectively, becomes more and more incompatible with an economic system that is organized such that: a) in order to maximize output, the potential of most humans is suppressed within a rigid, alienating division of labour; and b) the wealth generated is appropriated by a relatively tiny minority.

While one might be tempted to devalue the *Manifesto* as a piece of class “making” propaganda, the same sort of language and dialectical logic is visible in *Capital*:

Along with the constantly diminishing number of the magnates of capital, who usurp and monopolize all advantages of this process of transformation, grows the mass of misery, oppression, slavery, degradation, exploitation; but with this too grows the revolt of the working class, a class always increasing in numbers, and disciplined, united, organized by the very mechanism of the process of capitalist production itself. The monopoly of capital becomes a fetter upon the mode of production, which has sprung up and flourished along with, and under it. Centralization of the means of production and socialization of labour at last reach a point where they become incompatible with their capitalist integument. This integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated. (p. 929)

The teleology and determinism seemingly inherent in Marx’s materialist history remains highly debatable, and the implications for class—as an analytical concept and a causal factor in revolutionary change—remains rather unclear, leading to substantial disagreement and often incompatible views on the direction and causes of historical change among Marxists and critical social theorists.

Those employing or critiquing Marx’s work too often over-emphasize his predictions of class polarization and the transition to communism and under-emphasize his deep commitment to detailed historical analysis. Adding to this
confusion is Marx’s different uses of “class” in his corpus, and his sometime contradictory statements of when a class exists.\textsuperscript{155} To attribute a simplistic two-class model and inherent “classness” (and class struggle) to Marx is, however, to dramatically reduce the scope and complexity of his analysis. As Andrew (1975) has argued, class in Marx’s work is most certainly a grouping related to material reproduction (in capitalism, primarily tied to “economic” activity), and not a consumption-based group or income strata. Yet the proletariat as a “class” was and is not a historical given in Marx’s theory. Nor is overt class struggle a given. In work on then-contemporary events, Marx exhibits a much more subtle and complex analysis of what constitutes a class, the specificity of class formation, and the range of existing classes. In *The Eighteenth Brumaire of Louis Bonaparte* (Marx, 1968), a wide range of political groups are identified: the landed aristocracy, financial capitalists, industrial capitalists, the peasantry, the urban petite-bourgeoisie, the proletariat and the lumpenproletariat (as well as other minor groups including the army, civil servants, church officials and staff, and the intelligentsia. Do these groups constitute classes? This is difficult to say, but Andrew argues that if they do constitute classes it actually corresponds more closely with an oft neglected nuance in *Manifesto*: ”Of all the classes that stand face to face with the bourgeoisie today, the proletariat alone is a really revolutionary class” (p. 465; my

\textsuperscript{155} While Marx had much to say about trajectory of the class structure within capitalism—a homogenization of wage-labour into a cohesive and politically active proletariat—he never provided a clear, concise description of class as a concept. The third volume of Capital ends with the definition of class unfinished.
It seems, then, that Marx did not deny the existence of other classes,\textsuperscript{156} rather it was in prediction of long-run historical change that the two-class model was central.

Even in his most abstract and generalizing work, such as amendments to \textit{Capital} (1990) that appear in the “Appendix,” Marx recognized the hierarchy and heterogeneity of the existing labour force. Wage-labourers can be of two types: the first is productive, in that their work directly contributes to the creation of surplus value; the second is unproductive labour, in that the labour is purchased only for its use-value and comes out of revenue, adding nothing to the creation of surplus value. While this distinction has been used by some neo-Marxists to separate professionals and technical workers from the proletariat (e.g., Poulantzas (1975) assigns most of the latter to a “new petty bourgeoisie” category), Marx appears to have considered many professionals and technical workers either productive “wage-labourers,” or soon to be productive workers, subsumed and incorporated within socialized, commodity producing production (see quote on the “real subsumption of labour” in Chapter Two). This issue of class composition, and the uncertainty surrounding it, parallels the uncertainty around Marx’s position on class formation.

Marx’s work is often interpreted as suggesting that capitalism creates the proletariat and that this “revolutionary” class will inevitably rise up.\textsuperscript{157} Certainly, there is plenty of evidence to support such a position in the \textit{Manifesto}. Within contemporary

\textsuperscript{156} With the variety of uses of class employed by Marx, it is possible he was describing what contemporary neo-Marxists call “class strata” rather than fully developed classes (see Wright, 1990).

\textsuperscript{157} Marx’s belief was that until the proletariat come to understand the systemic nature of their daily oppression, their existence is one of, if not false consciousness, great compromises based on modernity’s emphasis on the private individual (Sayer, 1991). However, when workers have nothing left to lose, class consciousness would solidify, the class struggle would finally enter its revolutionary stage and society would make its final, albeit uneven, shift towards communism.
class analysis, the great majority of researchers take what can be called a “nominalist” position, whereby classes, and therefore a class structure, exist largely irrespective of class action. Yet there is evidence, again from the *Eighteenth Brumaire*, that problematizes such an approach. Andrew (1975) alerts us to the following passage, in which Marx analyzes the failure of the proletariat struggle and Napoleon’s appeal to a peasantry lacking class cohesion:

> In so far as there is merely a local interconnection among these small-holding peasants, and the identity of their interests begets no community, no national bond and no political organisation among them, they do not form a class. They are consequently incapable of enforcing their class interests in their own name, whether through a parliament or a convention. They cannot represent themselves, they must be represented. (p. 200)

There is ambiguity here: a group can have “class interests” without being an active “class.” In contrast to capitalism mechanically producing class struggle, we see here a much more agency-oriented theory of class formation, closer to the class-making, “realist” approach advocated by English historian E. P. Thompson (1995) and extended recently into a thesis of classlessness in advanced capitalist societies (see Kingston, 2000). An alternate reading is that Marx is pointing out that lack of “socialization” among the peasantry (their rural “idiocy”) prevents a common situation and relationship to other classes, contrasting with the bourgeoisie and the proletariat. In any case, the point holds that there is ambiguity in Marx’s treatment of class and that the boundaries between class-in-itself and class-for-itself are less clear than the conceptual dichotomy suggests.

Marx left behind a large, complex and sometimes ambiguous theoretical and analytical body of work. His “materialist” history undoubtedly includes elements of teleology, of which the systemic contradiction within capitalism between the
socialization of productive forces and the privatized nature of accumulation can be interpreted as a key part. It includes as well a notable tendency towards “technological progressivism” and a positive orientation to rational behaviour (Kirkpatrick, 2008), in that—fostered by capitalist competition—mechanical increases in productivity lay the foundation for a different, communist social order. It is not machinery that is the problem, for Marx, but the way it is used and how individuals are attached to these machines in a sustained and subordinated way. The seeming teleology and technological determinism in Marx’s work contrasts, however, with the following passage from his final days:

For almost forty years we have stressed the class struggle as the immediate driving power of history and in particular the class struggle between bourgeoisie and proletariat as the great lever of modern social revolution; it is, therefore, impossible for us to co-operate with people who wish to expunge this class struggle from the movement. (Marx, 1972; cited in Andrew, 1975, p. 464)

On the one hand, then, a theory of history that claims to uncover a directionality driven by a dynamic, deeply immoral mode of production; on the other, an unwavering commitment to study historical variation and the ways in which classes form or do not form, and a stated condemnation of theory that propose to map out history without detailed study of history (Giddens, 1979).

Max Weber.

Out of Max Weber’s large body of work—which includes substantial investigations of religions (Weber, 1993; Weber & Kalberg, 2011), the development of legal systems (Weber, 1954), and sustained reflection on interpretive methodology and researcher-standpoint in the social sciences (Weber, 2011)—I want to focus on a number of inter-related topics most relevant to this project: the contradictory effects of
rationality; the organization of work, with specific emphasis on bureaucracy and scientific management; and how these two topics impact on power and class.

Kalberg (1980) identifies four basic forms of rationality across the breadth of Weber’s work: practical, theoretical, substantive, and formal (compare Levine, 1985). Practical rationality is pragmatic and self-interested action, emerging where magic and mystification have receded and been replaced by ethical salvation religions (e.g., Protestantism), and frequently the orientation of merchants, traders, and artisans. Theoretical (or intellectual) rationality involves the “conscious mastery of reality through the construction of increasingly precise abstract concepts rather than through action” (p. 1152), seeking holistic explanations and the interrelationships of things and processes. Substantive rationality orders action into patterns, but unlike the purely pragmatic “practical rationality,” it is oriented to making one’s action consistent with an entire cluster of values. This form of rationality is a reflection of humans’ capacity to conduct activities based on a negotiated, “value-rational” basis. There is an element here of perspectivism, or subjectivism, where one person’s substantive rationality is not necessarily that of another person, a notion emerging from Weber’s “conviction that values are not demonstrable by the methods of science” (p. 1157). Contrasting with, and often antagonistic, to substantive rationality is formal rationality. This form of rationality is historically specific, appearing with the rise of industrialization and the popularization of universal laws, regulations and rules. Formal rationality is linked to

158 Levine further divides each of these four types of rationality by an objective/subjective dichotomy. The former occurs as each type of rationality is applied within institutions, the latter manifests itself within mental processes and self-construals.
abstract rules, of coordinated human activity that is impersonal or, as Weber put it, is conducted “according to calculable rules and without regard for persons” (1946, p. 215).

For Weber, the privileging of formal rationality has the potential to suppress creativity, individuality, and free expression, creating a society ruled by self-important and self-congratulating technocrats. Near the end of The Protestant Ethic and the Spirit of Capitalism (1992), Weber writes:

> No one knows who will live in this cage in the future, or whether at the end of this tremendous development entirely new prophets will arise, or there will be a great rebirth of old ideas and ideals, or, if neither, mechanized petrification, embellished with a sort of convulsive self-importance. For of the last stage of this cultural development, it might well be truly said: “Specialist without spirit, sensualists without heart; this nullity imagines that it has attained a level of humanity never before achieved.” (p. 182)

We see in this passage the coalescing of a number of themes from Weber’s work: his resistance to committing to any sort of mechanical unfolding of history; his critical evaluation of the way technology was being used in human activity; his belief in the need for individuals, especially social scientists, to maintain an ethical framework; and a decided pessimism about the world he saw around him. This mixture of realism and idealism shaped his analysis of human organization, of capitalism, and the potential for society to transcend difference, hierarchy, and domination.

According to Weber, bureaucracies are “[o]bjectified intelligence,” and an “animated machine” (1978, p. 1402). As an ideal type, bureaucracy is characterized by six common features (1978, pp. 957-958): 1) officials are assigned fixed duties; 2) precisely defined authority results in a hierarchy or pyramid of decision-making; 3) written rules and documents coordinate all activity; 4) officials possess expert, specialized training; 5) salaried employees are required to separate their public and private lives; and 6) standard rules are applied to a variety of circumstances in order to
manage the organization. This structure provides bureaucracy a tangible advantage over previous and competing forms of administration: “The decisive reason for the advance of bureaucratic organization has always been its purely technical superiority over any other form of organization” (p. 973). Comparing bureaucracy to a machine, Weber writes further that, “[p]recision, speed, unambiguity, knowledge of the files, continuity, discretion, unity, strict subordination, reduction of friction and of material and personal costs” (p. 973) are optimized in bureaucracy through “the principle of specializing administrative functions according to purely objective considerations” (p. 975).

Paralleling the broader contradiction inherent in rationality, Weber argues that the very forces that brought modern society into being—the search for equality, fairness and rationality that was the Enlightenment—are the same forces that stimulated the growth of repressive bureaucracy. Breeding an impersonal professionalism amongst white-collar worker, bureaucracy fostered among the general population an experience of the self as dependent and powerless (SH Kim, 2004). The organization that embraces and extends bureaucratic principles creates an “iron cage” that closes down agency, difference, and non-technical, “subjective” and locally decided ends; bureaucracy as a way of thinking about and means of reproducing power, in terms of rational specialization and training, was “escape-proof” (p. 1401; compare Marx, 1970).  

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159 While Marx had relatively little to say about bureaucracy, what he did say suggests he viewed such organizations in much the same way as Weber (1978). Marx, writing in 1844 about state bureaucracies, declared that “[t]he bureaucracy is a circle from which no one can escape. Its hierarchy is a hierarchy of knowledge. The highest point entrusts the understanding of particulars to the lower echelons, whereas these, on
While much of Weber’s work was oriented to “public” administration within state government, he was unequivocal about the appeal of impersonal bureaucracies for capitalist organizations. Weber writes:

Today, it is primarily the capitalist market economy which demands that the official business of public administration be discharged precisely, unambiguously, continuously, and with as much speed as possible. Normally, the very large modern capitalist enterprises are themselves unequalled models of strict bureaucratic organization. (p. 974)

One of the key motivators, notes Weber, is the increasing speed of communication, and the need to optimize “reaction time” (p. 974) to important economic information and/or events. This, for Weber, applied to both to the bureaucracy and the factory; formal rationality involves not just bureaucracy but the totality of human production and reproduction.

Weber, while often strongly associated with bureaucracy, was also fully aware of the spread of Scientific Management. In the following passage we see Weber link “Taylorism” to the expansion of formal rationality in the “modern capitalist factory,” and at the same time exhibit a humanist concern that in many ways echoes Marx’s concern with alienation and condemnation of the subservience of workers to the needs of “machinery”:

[O]rganizational discipline in the factory has a completely rational basis. With the help of suitable methods of measurement, the optimum profitability of the individual workers is calculated like that of any material means of production. On this basis, the American system of “scientific management” triumphantly proceeds with its rational conditioning and training of work performances, thus drawing the ultimate conclusions from the mechanization and discipline of the plant. The psycho-physical apparatus of man is completely adjusted to the demands of the outer world, the tools, the machines—in short, it is

the other hand, credit the highest with an understanding in regard to the universal; and thus they deceive one another” (p. 90).
functionalized, and the individual is shorn of his natural rhythm as determined by his organism. (p. 1156)

Where bureaucracy appears in Weber’s work as the tool to control intellective labour, as well as the social technology that takes over political organization and state action, Scientific Management appears—at least at its inception—as the primary rational tool to control manual labour.

For Weber, then, bureaucracy and scientific management form the context in which groups struggle for power. Weber defined power as the ability of an individual or group to “realize their own will in a communal action even against the resistance of others who are participating in the action” (1946: 180). For Weber, power is structured around domination and subordination, emanating and sought out within three domains: class, status, and party. In contrast to Marx, who emphasized class as the root of social power and change, Weber sought a more multidimensional approach in identifying class, status and party as the fundamental sources of power. Regarding class, and in contrast to Marx’s prediction of trends toward homogeneity within and polarization between class, Weber predicted heterogeneity. This heterogeneity related both to those who own property, in terms of type of property and how they are able to use it to generate more property, and those who do not own property, in terms of if and how they are able to offer services of varying specialization.160 The ability to enter into

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160 Weber’s distinguishing between “property class” and “commercial class” in *Economy and Society* adds further complexity to his approach. Property classes are fairly straightforward and involve groups “positively” (rentiers) and “negatively” (debtors, paupers, etc.) privileged in relation to property, with “various ‘middle classes’…which make a living from their property or their acquired skills” (p. 303) He then indicates that some of the middle “property” classes may also be commercial classes. The concept of commercial classes is less clear, and combines in “positively privileged commercial classes” entrepreneurs, professionals and “workers with monopolistic qualifications and skills” (p. 304). “Negatively privileged commercial classes” includes laborers with varying qualifications (skilled, semi-skilled, and unskilled). In the middle are self-employed
and exercise advantage in the commodity and/or labour markets are fundamental to class location. Weber’s famous axiom is that “[c]lass situation is...ultimately market situation” (p. 928).

Non-owners are thus often if not always excluded from competing for high cost goods and services, and as well are excluded from the opportunity to use material property to increase their wealth through entrepreneurial ventures. Weber identifies the labour market, the commodity market, and the capitalistic enterprise as “social actions” that determine the class situation (and life chances) of workers and owners/entrepreneurs. But, at the same time, capitalism presupposes a legal order that protects private property.

The confluence of property, market situation, and various locales where class “happens” leads Weber to emphasize property but at the same time recognize that in (then) contemporary society—characterized by increasingly sophisticated production, complex bureaucracies, and the importance of theoretical and formal rationality—privilege was based not only on ownership but also education. Weber’s asserts that classes are not “communities” even if they represent bases for potential class action. Class struggle comes about only under specific historical circumstances, is based on cultural \textit{and} economic conditions, and is more likely where class situations are clear and polarized. More specifically, “class-conscious organization” (p. 305) is more effective where the antagonistic party is clearly identifiable, large numbers of farmers and craftsmen as well as public and private officials, and many professionals and workers with monopolies on skill. His distinction between the two is not adequately elaborated and seems to contradict his emphasis on property through most of his other writing. In any event, he ends up collapsing property and commercial classes into “social classes” that are more consistent with his general usage of class.
individuals are in the same class situation, these individuals are located in close proximity to one another (e.g., a factory), and members of the intelligensia outside their class are working to clarify and “impose” goals. Social action, in Weber’s conception of power and struggle, is made significantly more complex and contingent by his concept of status.

Status groups, in contrast to classes, are “communities,” and are structured around honour and manifested in styles of life and consumption patterns. They come to form what Weber (1978) calls the “social order” and can be composed of people from different classes, with inclusion based on “any quality shared by a plurality” (p. 932). Weber, however, is clear that while status groups show a strong aversion to “naked economic power” and “pretensions of purely economic acquisition” (p. 932), and that “[p]roperty as such is not always recognized as a status qualification...in the long run it is, and with extraordinary regularity” (p. 932). Indeed, the “social order is of course conditioned by the economic order to a high degree, and in its turn reacts upon it” (p. 938).

In the relationship between status and class, actions oriented to status are held to preoccupy individuals and groups until the “causes and the consequences” (p. 184) of class situation and life-chances are transparent enough to arouse class action:

When the bases of the acquisition and distribution of goods are relatively stable, stratification by status is favored. Every technological repercussion and economic transformation threatens stratification by status and pushes the class situation into the foreground. (1978: 938)

The explicit message here is that the sources of social power and struggle are always in flux. At times, the material and mobility disparities of capitalism may be reduced through regulation and general “social action,” and citizens may enjoy enough material
wealth that other aspects of their lives come to dominate their day-to-day experiences and identity formation. However, conflict over material conditions always has the potential to reappear and, as rational science and technologically derived efficiency has so come to dominate modern life, it is likely we are to understand from Weber that class situation will be pushed to the foreground with some regularity. Weber's prediction is that bureaucracy will continue to expand and thus we can infer that he sees the strong potential for the class situation to dominate social relations, and for the basis for class action and class struggle to strengthen and intensify.
Appendix B – Rejecting Class Analysis

The rejection of class theory and class analysis has come from a number of directions, including mainstream post-industrial theory, postmodernism, post-structuralism, and even from within class analysis itself. For many, other forms of oppression and inequality such as gender, ethnicity, religion, sexual orientation, etc. have become the dominant axes of objective stratification and identity formation within society. Where economic differentiation has occurred it has tended to be been oriented around consumption and status rather than property (G. Marshall, 1997).

In what we might called “post” class analysis analysis, Paul Kingston (2000) does not deny that the class structure exists and affects the “fundamental content of social lives” (3). However, according to his avowed “realist” approach, to remain valid and useful class theory must prove that social divisions “correspond to the collective realities that people experience and perceive” (p. 3).161 Depending on Anthony Giddens’ concept of structuration, which examines how economic relationships become non-economic social structures, Kingston finds that, in America at least, class structuration (i.e. class consciousness and class-based action) is weak and that people do not share distinct experiences. More specifically, Kingston finds little evidence of class cohesiveness or class reproduction in each of the five dimensions of structuration: inter- and intra-generational mobility patterns, social interaction patterns, cultural orientations, class sentiment, and political action (pp. 209-210). Kingston is not, like many arguing against a class fixation, asserting that inequality and oppression are not

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161 Aronowitz (2004) has pushed class in the direction of social movements and realist concerns, moving from E.P. Thompson’s concern with classes as historical specific phenomena in which Althusser’s structuralism was refuted towards a incorporation into the concept of class just about any social struggle.
important factors in people's lives; rather, his argument is that such negative
experiences either have nothing to do with class or, even if they do, people no longer
think about or through their class position.

Jan Pakulski and Malcolm Waters have written what is perhaps the most well-
known and broadly referenced attack on class. Its title direct if somewhat sensational,
*The Death of Class* (1996) posits that class identities, ideologies and organizations are
dissolving in advanced societies. The authors do not deny that social inequality
continues in terms of access to economic resources, political power and status. The
evidence collected by the authors leads them, however, to conclude that many of the
objective aspects of class inequality, as identified by Marx and Weber, have actually
ameliorated. For Pakulski and Waters, “class died somewhere between the beginning of
the twentieth century and the end of the Great Depression” (pp. 25-26). Class analysis-
based sociology has failed to:

recognize that oppression, exploitation, and conflict are being socially
constructed around transcendent conceptions of individual human rights and
global values that identify and empower struggles around such diverse focuses
as postcolonial racism, sexual preferences, gender discrimination,
environmental degradation, citizen participation, religious commitments and
ethnic self-determination. These issues have little or nothing to do with class. In
the contemporary period of history the class paradigm is intellectually and
morally bankrupt. (p. 26)

Breaking down not only class consciousness but class structure, there has been a
wide redistribution of property; indirect and small ownership has grown significantly;
occupations have professionalized and skills have been credentialed; and consumption
has taken a much greater role in terms of status and lifestyle (p. 4). Pakulski and Waters
believe that class analysts face a number of dilemmas as they attempt to reconcile their
discipline with obvious societal changes. The more successfully class analysts are in
reconfiguring their class maps, the more class analysis: merges with non-class
approaches; loses its theoretical relevance and capacity for predicting social change;
and loses its ideological relevance for those searching for more equitable societal
alternatives. According to Pakulski and Waters, class theory and class analysis were
historically appropriate: it isn’t that Marx was wrong in privileging class at the time he
wrote, it is just that such an emphasis is no longer tenable. Within what I would term an
evolutionary Weberian framework, Pakulski and Waters argue that an “economic-class
society” dominated through the nineteenth century, an “organized-class society” was
pervasive through the first seventy-five years of the twentieth century, and since the
mid-seventies a “status-convention society” has emerged.162

In a variant of the “death of class” argument, the critique of “class reductionism”
has been extended and re-directed by thinkers associated with
poststructuralist/postmodern ideas. They argue the idea and study of class is plagued
by positivist and teleological tendencies, obsessed with modernist ideas like “class
locations”, and often simplistic in its dualities and mechanics of class reproduction
(Gibson-Graham, Resnick, & Wolff, 2001; Resnick & Wolff, 1987). At the heart of this
critique is a concern with “textuality” (Milner, 1999: 147) and culture where

162 According to Pakulski and Waters, in economic-class society the binary between the propertied and the wage
labourers is most intense and is translated into visible class cultures. The organized-class society is
characterized by a strong political/state system where bureaucrats rise to power. The bureaucratic elite use state
apparatus (both visible and covert) to regulate economics and culture, redistributing wealth and shifting some
private property into the public realm. Mass culture develops along-side national-political classes (as opposed to
economic classes). Finally, in the status-conventional society the economic and the political spheres are
destabilized as stratification emerges almost entirely from the cultural sphere. Constantly shifting stratification-
communities form around “differentiated patterns of value commitment, identity, belief, symbolic meaning,
taste, opinion or consumption” (p. 25).
manifestations of class identity and consciousness (at least obvious manifestations) have given way to identity politics and individualism (Savage, 2000).

As Milner (1999) argues, however, most of the conclusions about the irrelevance of class from within postmodern circles are based in theory, and that “the more theoreticist the sociology, the less likely it is to accord significance to social class” (146). The postmodern critique has in turn itself been critiqued as “surprisingly compatible” with neoliberalism in its celebration of difference and identity as cultivated through consumptive habits while ignoring the marginalization of those who cannot afford to live certain lifestyles (Milner, 1999).

More broadly, the question of where postmodernism finds it support begs investigation:

[O]ne obvious line of inquiry, suggested by the tradition of class analysis itself, is the possibility that the theoretical retreat from class might in some way express the class interests of its advocates amongst the professional intelligentsia. (Milner, 1999: 148)

The identification of the “professional intelligentsia” by Milner may even be too narrow, for in a Western (especially North American) culture deeply oriented to an individualist agenda, the resistance to class is rather expected. Such a possibility poses a contrast to “new class” critics who see claims about its existence as power-seeking projects by the professional intelligentsia and others in the middle layers of society. It may be that both processes—new class and cultural stratification—are operating at the same time and point to yet another contradiction amongst professionals, technical workers, managers and others operating in the “centre flux” of contemporary capitalism.
Appendix C – Beyond Occupation: Bourdieu and Class

An important criticism leveled at “occupational” class analysis is who it often ignores, or at least marginalizes; namely, the unemployed, the underemployed, the retired, students, and, for a time, women. Such an approach fixates on occupation as the key proxy for class position also couldn’t account very well for the cultural and economic-policy influence of highly educated experts in spheres of activity outside the workplace. Bourdieu’s work on various forms of capital can be linked to broader efforts that challenge theories of class as the fundamental axis of social stratification, in general, and occupation as the key factor in deciding class, specifically.

Bourdieu’s approach to class (1984) links occupations but in a loose and preliminary sort of way, instead emphasizing social relations as they emerge from differential access to credentials, different dispositions that emerge out of the culture one is raised and lives in ("habitus"), and differential possession of resources that grant power. Classes exist in “social space” and can be examined through (and explain) aesthetic differences, or “taste.” The main theoretical tool that Bourdieu uses to express these differences is “capital,” or a “set of actually usable resources and powers” (1984, p. 114). Capital thus loses its connection to the (control over the) means of production and instead takes on a much more flexible role in social analysis, with individuals possessing varying amounts of “economic capital” and “cultural capital,” the latter

163 Goldthorpe for a time in the 1980s defended reading off a woman’s class based on their husband’s occupational class, though he has since refined if not rejected this approach. His was not an argument that women ‘didn’t matter,’ only that in the class relations of the time a family’s class position was largely determined by the husband (see Crompton, 2008**). Among neo-Marxists, Wright held a similar view of women’s class being “derived” from their husbands’ class position, though he too has altered his theoretical model. See Appendix D for a fuller discussion of gender and work.
mainly gained through the family and schooling. The class structure that develops differentiates classes based on combinations of economic and cultural capital, with occupations still playing a fairly major role if only as the starting point in the study of class. The dominant class is thus made up of owners, professors, executives and senior policy makers, with unskilled manual workers as the prototypical working class. In between are a host of occupational groups, including secretaries, public school teachers, technicians, and small business owners, who are described as “petty” bourgeoisie (pp. 128-129). Bourdieu then identifies what can roughly be called horizontal antagonisms within classes. For example, professors, with high cultural capital, exist in opposition to executives and owners, who possess high economic capital but little cultural capital. The petty bourgeoisie and the working class are likewise differentiated along the economic-cultural binary. Finally, Bourdieu includes a temporal element that tracks mobility within and between generations. Of particular note is Bourdieu’s rejection of boundaries in favour of a conceptualization of social space where individuals’ class position are continuous even if they “cloud” together in rough groupings.

Bourdieu’s theory of class presents both advantages and drawbacks. His emphasis on practice and empirical evidence is welcome, suggesting an approach that incorporates attention to both structural factors that limit agency and to the ways in which actors consciously and unconsciously reproduce existing social structure. Likewise, his assertion that social class is more than just occupation is welcome and, I believe, justified. Yet Bourdieu’s approach also risks devolving into a categorical system of “capital arithmetic” in that it pays scant attention to causal mechanisms that lead to the emergence of classes. In focusing so much on updating Weber’s work, and on consumption (or “taste”), Bourdieu has conflated class with status. Bourdieu’s work on
class is useful to the study of power and inequality, or what might be called 
stratification, but the relations between those who control the means of production and 
those who sell their labour is buried so deeply in the conceptual system as to be 
decidedly marginal.
Appendix D – Gender, Race and the Labour Process

The issue of gender is significant, with many class theorists—particularly Marxists—claimed to be engaging in various degrees of class reductionism. In response, efforts have been made to recognize gender and integrate it into studies of power. Marxist feminists have contributed to the study of causality and relationship between class and gender. More recently, the study of “intersectionality” has also included issues of race, gender, and other ascribed and achieved forms of social stratification / domination. The participation of women in the workforce has increased steadily since World War II; however, even if participation rates have moved towards parity, the experiences of women and access to jobs remains as a major form of inequality.

Clement and Myles (1994) in their research on gender and class in Canada note that the issue of women entering workforce is "at once the most striking and the least well comprehended by conventional class theory" (p. 243). Indeed, much of the “new class” theorizing is mute or makes only brief mention of gender differences.

Smith (1994) describes how researchers have approached gender as a social relationship “deeply implicated in both the design and the maintenance of control strategies and skill levels” (p. 410), examining the ways employers use traditional patriarchal assumptions to restrict women in lower wage, supposedly less skilled work. For Cockburn (1983), the patriarchy that has negatively impacted on women’s skill recognition within capitalism is not an add-on to this latter system; it is an equally powerful and separate system of domination that must be recognized as such. In constant interaction, the “dual systems” of capitalism and patriarchy use skill as a “weapon” (p. 116) within ongoing class- and gender-based struggles. The relationship
between the skilled man and the unskilled man is not just about capitalism, and the relation between males and females is not just about patriarchy:

In reality, both sets of relations demand analysis in terms of both systems. The dissension of men and women springs partly from the processes of patriarchy, reflecting the interests of men in subordinating women, and partly from those of capitalism: capital has super-exploited women’s labour power and has repeatedly used women to weaken male workers. Likewise, relations between men, even though these are enacted in this instance within the sphere of capitalist production, nonetheless reflect the structure of patriarchy. (p. 125)

Patriarchy, in this sense, is about hierarchy and social rules within masculine groups as much as it is about solidarity between gendered groups.

This has erroneously, if not intentionally, led to a significant number of high-skill, “female” occupations being defined as unskilled. Huws (2003) argues that various sectors of the labour market, such as the service-industry or data processing, are often considered implicitly feminine, devalued, and designated “unskilled” by management and workers’ associations, both traditionally male-dominated. The over-representation of women in these less powerful, less unionized sectors, where work is often part-time and/or contingent and susceptible to routinization, has meant women are especially prone to outsourcing. Thus, a large number of female workers who have paid work are still expected to take responsibility for domestic and child-related duties, while experiencing high levels of job insecurity and labour intensification.

Women working in professional, technical and managerial positions must “fit in” with the culture of long hours and commitment to organizational goals, while still being expected to take on much of the domestic labour. The stress and work intensification of female employees are also being compounded by rising connectedness and expectations of availability (Huws, 2003). Women, then, tend to be more frequent users of non-standard employment mechanisms like “flex-time” or contract work. The former
has been found to be, on the whole, an advantage and helps reduce stress (K. Marshall, 2006), but the latter trend has meant a shift of more women into precarious employment relationships within jobs and from secure fields into less secure, often “feminized” fields (Scott-Dixon, 2005). Gender, then, is an important lens in itself when studying the labour process and/or the dominant social structure, and is not simply a derivative of the capitalist relations of production. Canadian empirical evidence corroborates claims of ongoing inequality between men and women, though, despite some progress.

While women have made significant inroads into technical and professional work, many not only find another “glass ceiling” but also “glass walls” as some specialized labour and managerial work is feminized and some remains masculinized. *Women in Canada: A Gender-Based Statistical Report* (O'Donnell, et al., 2006), using Canada Census data, finds that women now make up almost half of the workforce in Canada, up from under 40 percent in 1976. Besides gains in an absolute sense, a shift has occurred in the types of jobs women are working. In terms of occupational groups, O'Donnell and fellow researchers (2006) report this shift in the proportion of women working in traditionally male fields has meant the balance within occupational groups is changing. Women have made inroads into several specialist (what O'Donnell et al. call “professional”) fields, and are now more than half of the employees in diagnostic and treatment jobs in medical and health, as well as half of the workers in business and financial specialist positions.

Despite the positive trends in access to the labour market, women remain disadvantaged in a number of ways. The *Women in Canada* report indicates that, as of 2004, women were more likely to work part-time and, as a group, made $36,500 per
year, just over two-thirds of the average male income. The investigators also found that women continue to be excluded from those specialist jobs that demand formal education and from professions oriented to “hard” science (e.g., engineering, mathematics, and the natural sciences). Neither have specialist occupations in education and health, especially nursing, changed much in terms of female-male distribution. Disaggregating growth in women’s access to managerial positions also suggests gains are not as positive as they appear on the surface. O’Donnell et al. find women were over-represented in low-level managerial positions, a finding supported by Livingstone and Pollock (2004) who make use of a variety of international and Canadian data, especially CCS (from Clement & Myles, 1994) and WALL survey findings, to show that management continued to be highly gendered if in novel ways. Male managers, and male workers in general, continue to be managed by men, particularly at the higher echelons of management and within corporate boards.

Like gender relations, issues like race and, more recently, sexuality, age and disability are being studied as important sources of inequality within the workplace. The interaction with class-making processes is complex, and continues to challenge those constructing theories about and conducting research on the “new” economy. For some, the recognition of various forms of power and inequality are more than simply “multidimensionality,” they represent the end of class as a useful tool for understanding contemporary society (see Appendix B).
Appendix E – Interview Schedule

1) Demographics
   a. Sex
   b. What is your age?
   c. How would you describe your ethnic/racial background?
   d. What is the highest level of formal education you have attained?

2) Occupational Information
   a. What is your occupation/job title?
      i. What is the status of your job?
         1. Part-time or full-time, contract
         2. Avg. hours per week
   b. What are your usual responsibilities and activities in your job?
      i. E.g., sales, IT support, business analysis, investment planning, R&D
   c. Please describe your employer.
      i. Size and function of organization
         1. [Head office, branch]
         2. [Sales, support, front-line provider, IT]
      ii. How is your organization structured?
         1. [Department, divisions, CEO, COO, CIO?]
      iii. Private or public
      iv. Sector
         1. [E.g., retail; communications; education; health; business services; IT; etc.]
   d. (If not a manager) Do you have any managerial or supervisory responsibilities?
      i. Have you had these responsibilities since you started your job?
      ii. Would you like more or less managerial responsibility?
      iii. How are you compensated for taking on these duties?
         1. [Annual income, career advancement, authority]
   e. What level of education is required for entry to your occupation/field?
      i. Certification?
   f. Briefly, how rigorous was the interviewing and entry process?
   g. In your job, how much on-the-job training is usually necessary before a new employee is competent?
   h. What level of education is actually required to perform your job?
   i. How necessary is it for you to learn new skills?
   j. How do you acquire new work-related skills?
      i. E.g., work-related training, self-directed
         1. [Who pays?]
2. [Is this adequate?]
   ii. Are you expected to update your skills on your own time?
      1. How often do you engage in self-directed learning?
         a. [Reasons]

k. Do you take courses or engage in self-directed learning that is non-work-related?
   i. Supported by employer?

l. How much does your personal life and work life intersect?
   i. Friendships, but also hobbies?

m. Are you working independently, as part of a team, or is your job a mixture of arrangements?

n. Do you have much say over how your job is performed?

o. What role does technology play in your job?
   i. What types of technology do you use?
      1. On-the-job
         a. Software & hardware
      2. On-call
         a. ICTs such as Blackberry, email
         b. How often are you contacted outside normal work hours?
   ii. How much say do you or did you have in the implementation/ adoption of these technologies? Did other employees have a say?
   iii. In what ways could current or new technologies be used more effectively?
   iv. Do current technologies impede or enable people’s ability to do their job in your organization?

p. How has your job changed since you started your job?

3) Organizational Structure (ask only those questions below not answered above)
   i. Would you prefer more managers/departments or less?
   ii. What is the relationship among staff and managers?
   iii. What forms of supervision exist within your organization
      1. [E.g., managers directs individuals, self-directing teams, work individually and autonomously]
   iv. Do you feel more supervision would help you in doing your job, or less?

b. Does your organization explicitly use and/or discuss knowledge management or knowledge mobilization or similar strategies?
   i. How is information and knowledge organized in your workplace?
      1. (Looking here for both business processes and HR practices; who drives KM initiatives)
      2. Re) social organization, ICT technologies, repositories/libraries, patents
   ii. Please describe any managerial strategies used to encourage performance and productivity.

444
1. [E.g., technology-based tracking and/or surveillance, outcome-based management, financial incentives, punitive measures]
   a. [formal and/or informal resistance and autonomy]

iii. In what ways could your [business/division/dept.] be run better or organized more effectively?
   1. [probe openness to greater worker involvement; management-employee committees; worker-run organizations]

4) Politics & Class
   a. Do you belong to any type of organization related to your occupation?
      i. [Union, collective bargaining, association]
      ii. [Involvement]
      iii. [Activity of organization]
      iv. [attitude towards organization, or lack of organization]

b. Do you think your occupation would benefit from a stronger organization that could engage in collective bargaining?

c. Are you at all worried about your job being outsourced?
   i. [in N.A., or overseas]

d. Do you expect more from your work than your parents did?

e. What do you think will come of the open source movement?

f. Which of the following would you like to see happen to the Canadian economy in the future?
   i. Larger national and multinational companies with less gov’t regulation
   ii. Smaller companies with more competition
   iii. Greater public-private partnership
   iv. Economy managed through agreements among private companies, government, and employee organizations
   v. Government control of major sectors
   vi. Workers controlling and managing their own organizations

g. Which of those scenarios do you think will actually happen?

h. What political party is generally closest to your views?
   i. [key issues leading to voting preference]
   ii. [attitude to welfare state; globalization; corporate power; nationalism and free trade]

i. Do you consider yourself part of any particular class?
   i. [if no, do they believe there are social classes]
   ii. [if answer given, probe how they perceive relationships between classes; what basic factors divide class]
Appendix F – Demographics of Interview Participants in Relation to their Occupation

Engineers

Table F1 presents data on the engineers who participated in the interview portion of my study. I aggregate data in a range of variables and then compare the engineers in my interviews to data from a 2002 survey for Engineers Canada (Ekos Research Associates Inc., 2003),\textsuperscript{164} which includes only engineers with their P.Eng credential, and with engineers with who participated in the 2004 Work and Lifelong Learning (WALL) Survey. To make comparison with the Engineers Canada (EC) study possible, based on the manner of data presentation, I have had to adopt a number of their categories. While somewhat arbitrary, the categories do provide a broad point of comparison among the three sample groups.

The comparison suggests that my participants are reasonably close to the two broader measures in sex, age, managerial role, and employment in a large organization (defined here as one with 1000 or more employees). My sample has a higher proportion of individuals from Ontario than the EC Survey (half compared to around 40 percent) but is quite similar to the nation-wide WALL Survey (just under half). Where my sample appears markedly different than the two broader surveys is in graduate and/or professional education, field of study and industry of employment. My sample is more highly educated, with a third possessing formal education beyond their engineering degree compared to the EC Survey (a tenth) and the WALL Survey (a fifth). The engineers I interviewed were more likely to be in mechanical engineering (half) than

\textsuperscript{164} Engineers Canada is the business name of Canadian Council of Professional Engineers.
P.Engs in general (under a fifth). They were also more likely to be involved in the extraction of resources, with half in the oil and gas or mining industries. Just a tenth of P.Engs in Canada are involved in the resources sector. Related to industry of employment, however, the difference between my sample and the others may be somewhat exaggerated. While Trisha and Chad both work in the oil and gas sector in Alberta, neither was directly involved in extraction activities. Trisha works for a company that manufactures piping for distribution while Chad is an executive in a company that specializes in the development and promotion of carbon sequestration technology.

It is difficult to assess income for my participants as two refused to provide any indication. As both are in management, with Trevor head of safety at a mine and Chad an executive who travels the world promoting the company, one can assume they are making near or over one-hundred thousand dollars per year. In any case, my sample appears to be better paid than the engineering workforce in Canada, but not drastically. The final item of comparison is the possession of the Professional Engineer (P.Eng) designation. The EC Survey only examined those possessing this credential, and therefore doesn’t offer a point of comparison. The WALL survey did not ask about possession of a professional credential, only if a credential was required for one’s work. Thus, it too doesn’t allow for comparison. A recent study (O’Grady, 2009b) jointly commissioned by EC and the Canadian Council of Technicians and Technologists does, however, provide relevant Canadian data. The study, focusing on licensure and certification, finds that around 70 percent of those in the 185,000 or so engineering occupations in Canada either have their P.Eng certification or are interning in order to acquire it. This finding suggests that my sample is fairly close to the national total,
particularly as Robert was an “intern” when we first spoke and continues to pursue his P.Eng.

Concerning unionization, none of the individuals I interviewed belonged to a union, and the EC study didn’t address this question. The WALL survey suggests that about one-fifth of engineers are unionized while over 40% belong to a professional association of some sort. It is not clear the extent to which those belonging to associations are covered by collective bargaining (like, say, doctors).
Table F1 Comparison of Engineers interviewed for this study (2007-09), a Professional Engineers’ study (2002), and the WALL Survey (2004)

<table>
<thead>
<tr>
<th>Participant</th>
<th>Sex</th>
<th>Age</th>
<th>Province</th>
<th>Education</th>
<th>Field of Study</th>
<th>Job</th>
<th>Sector</th>
<th>P. Eng</th>
<th>Certification Required</th>
<th>Management</th>
<th>Size of Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hui</td>
<td>Male</td>
<td>40</td>
<td>ON</td>
<td>Undergrad</td>
<td>Nuclear Safety</td>
<td>Nuclear</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>1,000+</td>
</tr>
<tr>
<td>Robert</td>
<td>Male</td>
<td>27</td>
<td>ON</td>
<td>MBA</td>
<td>Civil Environmental</td>
<td>Eng. Consulting</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>250-500</td>
</tr>
<tr>
<td>Trisha</td>
<td>Female</td>
<td>29</td>
<td>AB</td>
<td>Some college</td>
<td>n/a</td>
<td>Pipe Manuf. Oil &amp; Gas</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>11-49</td>
</tr>
<tr>
<td>Chad</td>
<td>Male</td>
<td>45</td>
<td>AB</td>
<td>Undergrad</td>
<td>Mechanical Environmental</td>
<td>Oil &amp; Gas</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>50-100</td>
</tr>
<tr>
<td>Trevor</td>
<td>Male</td>
<td>37</td>
<td>SK</td>
<td>Undergrad</td>
<td>Mechanical Safety</td>
<td>Mining</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>250-500</td>
</tr>
<tr>
<td>Matt</td>
<td>Male</td>
<td>44</td>
<td>ON</td>
<td>MBA</td>
<td>Mechanical Safety</td>
<td>Auto</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>1000+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant</th>
<th>% Male</th>
<th>Mean Age</th>
<th>% Ontarian</th>
<th>% with more than Eng Degree</th>
<th>% Mechanical</th>
<th>% Safety</th>
<th>% Resources</th>
<th>% P.Eng</th>
<th>% Requiring P.Eng</th>
<th>% in Management</th>
<th>% Large Employee (1000+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Totals</td>
<td>83</td>
<td>37</td>
<td>50</td>
<td>33</td>
<td>50</td>
<td>50</td>
<td>83</td>
<td>83</td>
<td>n/a</td>
<td>67</td>
<td>33</td>
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<tr>
<td>P.Eng Totals</td>
<td>91</td>
<td>43</td>
<td>38</td>
<td>10</td>
<td>16</td>
<td>n/a</td>
<td>12</td>
<td>100</td>
<td>n/a</td>
<td>77</td>
<td>42</td>
</tr>
<tr>
<td>WALL Survey</td>
<td>88</td>
<td>39</td>
<td>45</td>
<td>21</td>
<td>n/a</td>
<td>n/a</td>
<td>9</td>
<td>n/a**</td>
<td>35</td>
<td>52</td>
<td>43</td>
</tr>
</tbody>
</table>

* Participants would not provide income information during WALL survey response or interview.
** The WALL Survey asked participants if a credential was required, not if they possessed a credential. Only 35 percent answered that a credential was required.
*** Many respondents in the WALL Survey provided their income based on an ordinal range. When those who provided an actual amount were combined with those who provided ordinal range, the great majority (42%) made between forty and sixty thousand dollars per year.
Information Technology Workers

Table F2 below includes a range of personal and occupation-related variables for the IT workers I spoke with. I then compare my participants with IT workers in Statistics Canada’s 2007 Labour Force Survey, using findings from Wolfson (2007) and the Conference Board of Canada (2008), and data from the 2004 WALL Survey. Just as with the engineers, the IT workers who participated in my study are both similar and dissimilar from the entire IT workforce. The most immediate difference is the high proportion of women in my study. This was unintended, and presents a potential bias in that women in IT generally haven’t penetrated managerial roles in this male-dominated field. My sample is also slightly older than IT workers in general, though the IT workforce is aging (Conference Board of Canada, 2008; Wolfson, 2007). My sample is also Ontario-biased, though the great majority of IT workers do reside in either Ontario (half) or Quebec (a quarter) (Wolfson, 2007). Educational attainment among my participants is higher than the IT workforce in Canada but not drastically so. Interestingly, and key to my later analysis, only half of the IT workers I spoke with were formally schooled in IT. In Chapter Seven I link this finding with the concept of “downsourcing,” where non-IT workers are taking over jobs that were staffed and continue to usually be staffed by IT workers.

The IT workers I spoke with were employed in a variety of industries. Four of the six are in business services while one, Patricia, works for a company that manages a global hotel chain and another, Anne, works for a police force in a medium sized city in Ontario. The category of “Professional, Scientific and Technical
Services,” or PSTS, is based on broad industries defined by the 2002 North American Industrial Classification System (NAICS). While my participants are fairly close to the WALL Survey, the Labour Force Survey (LFS) indicates that the proportion of IT workers is more broadly distributed with just under half in PSTS, around a tenth in Manufacturing, and less than a tenth in each of Information and Culture, Public Administration, and Finance and Insurance.

In terms of job role, my participants were substantially more likely to be “analysts” than would be found in the broader IT workforce (around a quarter). LFS data indicates that analysts, while one of the larger and fastest growing IT occupations, is about the same size as programmers and technicians (just over a fifth each). These three occupations are much larger than IT managers (less than a tenth), computer engineers (around a tenth), and “other” IT workers (almost 15 percent). None of the participants reported requiring certification, while WALL data suggests that about one-fifth of IT workers are required to have some sort of certification. Certification among IT workers means something different from engineers’ P.Eng, with short-courses and seminars often leading to certificates of completion on specific pieces of software and/or hardware. While it appears statistically that my participants were more likely to be in a managerial role, one of those, Rhonda, is classified as “management” by the multinational she works for but doesn’t manage anyone and feels the designation is not accurate. If we exclude Rhonda, only one individual is a manager and my sample is in fact quite close to the national average of around a tenth.
My participants were just as unlikely to be unionized as the general IT workforce in Canada, at just under a fifth.\textsuperscript{165} All worked for employers with over 1000 employees while WALL data suggests that only around half of all IT workers in Canada are with such large organizations. Income is the most difficult variable to compare, as participants provided ranges rather than specific amounts. Some were not comfortable identifying an exact amount while others felt it inaccurate to give an exact amount as their wage fluctuated year-to-year due to bonuses. A rough examination suggests, however, that the individuals I interviewed earned slightly more than the average IT worker.

\textsuperscript{165} Labour Force Survey data indicates that a further 3\% of the IT workforce in Canada is protected by collective bargaining but are not unionized (Wolfson, 2008).
<table>
<thead>
<tr>
<th>Participant</th>
<th>Sex</th>
<th>Age</th>
<th>Province</th>
<th>Education</th>
<th>Field of Study</th>
<th>Job</th>
<th>Sector (NAICS)</th>
<th>Certification Required</th>
<th>Management</th>
<th>Size of Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>F</td>
<td>44</td>
<td>ON</td>
<td>College</td>
<td>Telecom</td>
<td>Analyst</td>
<td>Public Admin</td>
<td>No</td>
<td>No</td>
<td>1000+</td>
</tr>
<tr>
<td>Cynthia</td>
<td>F</td>
<td>34</td>
<td>ON</td>
<td>Undergrad</td>
<td>IT</td>
<td>Analyst (Servers)</td>
<td>PSTS*</td>
<td>No</td>
<td>No</td>
<td>1000+</td>
</tr>
<tr>
<td>Henry</td>
<td>M</td>
<td>37</td>
<td>ON</td>
<td>Undergrad</td>
<td>IT</td>
<td>Analyst</td>
<td>PSTS</td>
<td>No</td>
<td>No</td>
<td>1000+</td>
</tr>
<tr>
<td>Patricia</td>
<td>F</td>
<td>39</td>
<td>ON</td>
<td>Undergrad</td>
<td>Business</td>
<td>Analyst</td>
<td>Accommodation</td>
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<td>Yes</td>
<td>1000+</td>
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<td>Rhonda</td>
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<td>ON</td>
<td>College</td>
<td>Business</td>
<td>Analyst (Database)</td>
<td>PSTS</td>
<td>No</td>
<td>Yes</td>
<td>1000+</td>
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<tr>
<td>Vlad</td>
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<td>Programmer</td>
<td>PSTS</td>
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<td>No</td>
<td>1000+</td>
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<td><strong>Participant Totals</strong></td>
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<td></td>
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<td></td>
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<tr>
<td>% Male</td>
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<td>83</td>
<td>100</td>
<td>100</td>
<td>50</td>
<td>83</td>
<td>67</td>
<td>0</td>
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<td>100</td>
</tr>
<tr>
<td>% 35-44</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>% with College or Undergrad</td>
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<td></td>
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</tr>
<tr>
<td>% Non-IT Education</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>% Analysts</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>% PSTS</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>% Cert. Required</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% in Management</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<tr>
<td><strong>Labour Force Survey</strong></td>
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<td>33</td>
<td>49</td>
<td>75</td>
<td>n/a</td>
<td>23</td>
<td>44</td>
<td>n/a</td>
<td>8</td>
<td>n/a</td>
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<tr>
<td><strong>WALL Survey</strong></td>
<td>72</td>
<td>22</td>
<td>38</td>
<td>80</td>
<td>n/a</td>
<td>35***</td>
<td>60</td>
<td>19</td>
<td>12</td>
<td>48</td>
</tr>
</tbody>
</table>

* PSTS stands for Professional, Scientific and Technical Services.
** Labour Force Survey information was derived from 2007 data compiled in a report for the Information and Communications Technology Council (Wolfson, 2008) except for income data, which is from a Conference Board of Canada report (2008) that uses 2006 data on IT occupations.
*** This measure is based on National Occupational Classification (NOC) codes while the other WALL variables are based on older Canadian Classification and Dictionary of Occupations (CCDO) codes. CCDO codes have been used because they allow comparison with older data.
Table G1. Change in Occupational Composition Within Sex, Working Canadians, 1983-2004

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Large employers</td>
<td>% 1</td>
<td>0</td>
<td>% 1</td>
<td>+1</td>
</tr>
<tr>
<td>Small employers</td>
<td>% 8</td>
<td>+2</td>
<td>% 4</td>
<td>+2</td>
</tr>
<tr>
<td>Self-employed</td>
<td>% 16</td>
<td>-1</td>
<td>% 12</td>
<td>+6</td>
</tr>
<tr>
<td>Managers</td>
<td>% 10</td>
<td>+4</td>
<td>% 12</td>
<td>+8</td>
</tr>
<tr>
<td>Supervisors</td>
<td>% 5</td>
<td>+1</td>
<td>% 5</td>
<td>+2</td>
</tr>
<tr>
<td>Specialists</td>
<td>% 12</td>
<td>+3</td>
<td>% 21</td>
<td>+8</td>
</tr>
<tr>
<td>Service employees</td>
<td>% 18</td>
<td>-7</td>
<td>% 38</td>
<td>-27</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>% 30</td>
<td>-5</td>
<td>% 7</td>
<td>-1</td>
</tr>
<tr>
<td>Total</td>
<td>% 100</td>
<td>-5</td>
<td>% 100</td>
<td></td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,758); 2004 Work and Lifelong Learning Survey (N=5,436).
Table G2. Change in Sex Composition within Occupational Groups, Working Canadians, 1983-2004

<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>Men 2004</th>
<th>Women 2004</th>
<th>Total 2004</th>
<th>Change in Percentage of Women since 1983</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large employers</td>
<td>% 64</td>
<td>36</td>
<td>100</td>
<td>n/a</td>
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<tr>
<td>Small employers</td>
<td>% 70</td>
<td>30</td>
<td>100</td>
<td>+14</td>
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<tr>
<td>Self-employed</td>
<td>% 60</td>
<td>40</td>
<td>100</td>
<td>+18</td>
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<tr>
<td>Managers</td>
<td>% 51</td>
<td>49</td>
<td>100</td>
<td>+13</td>
</tr>
<tr>
<td>Supervisors</td>
<td>% 53</td>
<td>47</td>
<td>100</td>
<td>+15</td>
</tr>
<tr>
<td>Specialists</td>
<td>% 40</td>
<td>60</td>
<td>100</td>
<td>+8</td>
</tr>
<tr>
<td>Service employees</td>
<td>% 35</td>
<td>65</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>% 82</td>
<td>18</td>
<td>100</td>
<td>+2</td>
</tr>
<tr>
<td>Total</td>
<td>% 54</td>
<td>47</td>
<td>100</td>
<td>+5</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,759); 2004 Work and Lifelong Learning Survey (N=5,436).
Table G3. Opportunity to Design Work by Occupational Group and Sex, Canadian Employees, 1983-2004

<table>
<thead>
<tr>
<th></th>
<th>All or Most of the Time</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1983</td>
<td>2004</td>
</tr>
<tr>
<td>Managers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>85</td>
<td>72</td>
</tr>
<tr>
<td>Women</td>
<td>86</td>
<td>66</td>
</tr>
<tr>
<td>Supervisors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>80</td>
<td>76</td>
</tr>
<tr>
<td>Women</td>
<td>81</td>
<td>65</td>
</tr>
<tr>
<td>Specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>90</td>
<td>66</td>
</tr>
<tr>
<td>Women</td>
<td>77</td>
<td>69</td>
</tr>
<tr>
<td>Service employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>44</td>
<td>52</td>
</tr>
<tr>
<td>Women</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Industrial employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>34</td>
<td>50</td>
</tr>
<tr>
<td>Women</td>
<td>3</td>
<td>38</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,484); 2004 Work and Lifelong Learning Survey (N=4,246).
**Table G4. Opportunity to Design Work by Occupational Group and by Self-Identification as a Visible Minority, Canadian Employees, 1983-2004**

<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>Visible Minority %</th>
<th>White %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>63</td>
<td>70</td>
</tr>
<tr>
<td>Supervisors</td>
<td>64</td>
<td>72</td>
</tr>
<tr>
<td>Specialists</td>
<td>62</td>
<td>69</td>
</tr>
<tr>
<td>Service employees</td>
<td>39</td>
<td>50</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>40</td>
<td>49</td>
</tr>
</tbody>
</table>

*Sources: 2004 Work and Lifelong Learning Survey (N=4,166).*
Table G5. Change in Age Composition within Occupational Groups, Working Canadians, 1983-2004

<table>
<thead>
<tr>
<th></th>
<th>18-34 year-old workers</th>
<th>Change in Percentage of 18-34 workers since 1983</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1983</td>
<td>2004</td>
</tr>
<tr>
<td>Managers</td>
<td>%</td>
<td>30</td>
</tr>
<tr>
<td>Supervisors</td>
<td>%</td>
<td>26</td>
</tr>
<tr>
<td>Specialists</td>
<td>%</td>
<td>52</td>
</tr>
<tr>
<td>Service employees</td>
<td>%</td>
<td>64</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>%</td>
<td>55</td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>56</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,469); 2004 Work and Lifelong Learning Survey (N=4,146).
<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>All or Most of the Time</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1983</td>
<td>2004</td>
</tr>
<tr>
<td>Managrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34 %</td>
<td>77</td>
<td>64</td>
</tr>
<tr>
<td>35-64 %</td>
<td>87</td>
<td>72</td>
</tr>
<tr>
<td>Supervisors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34 %</td>
<td>88</td>
<td>73</td>
</tr>
<tr>
<td>35-64 %</td>
<td>78</td>
<td>71</td>
</tr>
<tr>
<td>Specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34 %</td>
<td>84</td>
<td>67</td>
</tr>
<tr>
<td>35-64 %</td>
<td>82</td>
<td>68</td>
</tr>
<tr>
<td>Service employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34 %</td>
<td>34</td>
<td>48</td>
</tr>
<tr>
<td>35-64 %</td>
<td>28</td>
<td>47</td>
</tr>
<tr>
<td>Industrial employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34 %</td>
<td>30</td>
<td>48</td>
</tr>
<tr>
<td>35-64 %</td>
<td>27</td>
<td>49</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,469); 2004 Work and Lifelong Learning Survey (N=4,180).
Figure G1. Level of Involvement in Decision-Making by Sex, Employed Canadians, 1983-2004

Sources: 1983 Canadian Class Structure Survey (N=1,580); 2004 Work and Lifelong Learning Survey (N=5,506).
Table G7. No Involvement in Decision-Making on Organizational Issues (e.g., budget, staffing, products), by Occupational Group and Sex, Canadian Employees, 1983-2004

<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>No Involvement in Organizational Decisions</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1983</td>
<td>2004</td>
</tr>
<tr>
<td>Managers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Women</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Supervisors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>47</td>
<td>25</td>
</tr>
<tr>
<td>Women</td>
<td>59</td>
<td>32</td>
</tr>
<tr>
<td>Specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>Women</td>
<td>62</td>
<td>48</td>
</tr>
<tr>
<td>Service employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>80</td>
<td>53</td>
</tr>
<tr>
<td>Women</td>
<td>91</td>
<td>62</td>
</tr>
<tr>
<td>Industrial employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>90</td>
<td>59</td>
</tr>
<tr>
<td>Women</td>
<td>97</td>
<td>72</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,483); 2004 Work and Lifelong Learning Survey (N=4,124).
Figure G2. Level of Involvement in Decision-Making by Self-Identification as a Visible Minority, Employed Canadians, 1983-2004

Sources: 1983 Canadian Class Structure Survey (N=1,507); 2004 Work and Lifelong Learning Survey (N=5,386).
<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>Age Cohort</th>
<th>No Involvement in Organizational Decisions</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1983</td>
<td>2004</td>
<td></td>
</tr>
<tr>
<td>Managers</td>
<td>18-34</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>35-64</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Supervisors</td>
<td>18-34</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>35-64</td>
<td>56</td>
<td>32</td>
</tr>
<tr>
<td>Specialists</td>
<td>18-34</td>
<td>57</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>35-64</td>
<td>49</td>
<td>42</td>
</tr>
<tr>
<td>Service employees</td>
<td>18-34</td>
<td>88</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>35-64</td>
<td>85</td>
<td>59</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>18-34</td>
<td>91</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>35-64</td>
<td>91</td>
<td>63</td>
</tr>
</tbody>
</table>

Sources: 1983 Canadian Class Structure Survey (N=1,469); 2004 Work and Lifelong Learning Survey (N=4,004).
Appendix H – Discretion and Decision-Making by Sector and Occupational Association

In this appendix I examine the role that sector (public or private) and membership (union, association, or neither) play in discretion and decision-making for specialists, in general, and IT workers and engineers, specifically. Overall, about two-thirds of all employees work in private-sector enterprises. According to Table H1, about the same proportion of managers and service workers (around 60 percent) are employed in the private sector. Well over three-quarters of industrial workers and supervisors are located in the private sector. Specialists are the only broad occupational group with more members in the public sector (including the non-profit sector), with just under 60 percent in the public sector and just over 40 percent in the private. Location in public or private sector appears to have little impact on discretionary opportunities for the various specialist occupations and a very small effect on decision-making participation, with those in the public sector enjoying slightly more involvement except for specialists.
Table H1. Employment by Sector, Opportunity to Design Work, and Exclusion from Organizational Decisions by Occupational Group, Canadian Employees, 2004

<table>
<thead>
<tr>
<th>Occupational Group</th>
<th>Distribution</th>
<th>Design Work All or Most of the Time</th>
<th>No Involvement in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private %</td>
<td>61</td>
<td>70</td>
</tr>
<tr>
<td>Managers</td>
<td>Public %</td>
<td>39</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Private %</td>
<td>79</td>
<td>72</td>
</tr>
<tr>
<td>Supervisors</td>
<td>Public %</td>
<td>21</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Private %</td>
<td>41</td>
<td>65</td>
</tr>
<tr>
<td>Specialists</td>
<td>Public %</td>
<td>59</td>
<td>69</td>
</tr>
<tr>
<td>Service employees</td>
<td>Private %</td>
<td>62</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>38</td>
<td>47</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>Private %</td>
<td>86</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>14</td>
<td>46</td>
</tr>
</tbody>
</table>

Sources: 2004 Work and Lifelong Learning Survey (Distribution N= 4,051; Discretion N=4,032; Decision N=3,925).

Where location in either private or public sector has seemingly little impact on decision-making participation, membership or non-membership in a union or association has a relatively strong impact. Including all employees who participated in the 2004 WALL Survey, 37 percent are members in a union, 12 percent are members in an association, and 52 percent are not affiliated with either a union or association. Table H2 shows over two-thirds of managers and supervisors are non-members. About a third of service employees are unionized while just under half of
industrial employees are in a union. Just under half of specialists are in a union (reflecting high numbers in the public sector), 16 percent are in an association, and just over a third are part of neither.

Managers not in a union or association, the clear majority, enjoy relatively high levels of what is most likely “delegated” discretion (69 percent) and only around a quarter report no involvement in decisions.\textsuperscript{166} Supervisors in unions, where power is often “negotiated” as much or more than it is delegated, have lower discretion and higher exclusion, but most are not in a union or association and these non-unionized supervisors enjoy high levels of discretion and low levels of exclusion. Omitting the very small percentage of service workers and industrial workers in associations, Table H2 indicates that the type of membership has a very weak effect on discretion and involvement in decisions, with those in neither union nor association enjoying slightly more opportunity for discretionary activities and involvement. Among specialists, type of association also had little effect, though the small percentage in associations enjoyed slightly more discretion and less exclusion. I will return to the issue of closure in the next chapter where I introduce interview material.

\textsuperscript{166} See Livingstone and Raykov (2009) who differentiate between negotiated and delegated authority: negotiated authority is based on the power of collective bargaining associations (unions or otherwise) while delegated authority is assigned by management to participate in decision-making beyond the realm of their specific job. These are obviously not mutually exclusive, instead blended in various ways based on local history and relationships. The survey data I use does not, unfortunately, allow much investigation into these two dimensions of workers’ power.
<table>
<thead>
<tr>
<th></th>
<th>Distribution of Specialist Group</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Managers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union</td>
<td>%</td>
<td>16</td>
<td>59</td>
</tr>
<tr>
<td>Association</td>
<td>%</td>
<td>19</td>
<td>77</td>
</tr>
<tr>
<td>Neither</td>
<td>%</td>
<td>65</td>
<td>69</td>
</tr>
<tr>
<td><strong>Supervisors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union</td>
<td>%</td>
<td>19</td>
<td>52</td>
</tr>
<tr>
<td>Association</td>
<td>%</td>
<td>13</td>
<td>73</td>
</tr>
<tr>
<td>Neither</td>
<td>%</td>
<td>68</td>
<td>77</td>
</tr>
<tr>
<td><strong>Specialists</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union</td>
<td>%</td>
<td>47</td>
<td>66</td>
</tr>
<tr>
<td>Association</td>
<td>%</td>
<td>16</td>
<td>75</td>
</tr>
<tr>
<td>Neither</td>
<td>%</td>
<td>37</td>
<td>67</td>
</tr>
<tr>
<td><strong>Service employees</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union</td>
<td>%</td>
<td>35</td>
<td>46</td>
</tr>
<tr>
<td>Association</td>
<td>%</td>
<td>10</td>
<td>53</td>
</tr>
<tr>
<td>Neither</td>
<td>%</td>
<td>55</td>
<td>47</td>
</tr>
<tr>
<td><strong>Industrial employees</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union</td>
<td>%</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Association</td>
<td>%</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
<td>Neither</td>
<td>%</td>
<td>47</td>
<td>51</td>
</tr>
</tbody>
</table>

*Sources: 2004 Work and Lifelong Learning Survey (Distribution N= 4,268; Discretion N=4,244; Decision N=4,123).*

These patterns of discretion and decision-making involvement evident in the respective tables above are largely repeated when specialists are disaggregated for
the respective variables. Table H3 shows that sector of employment is mainly relevant for technologists and specialist support and IT workers. IT workers in the private sector enjoy slightly more discretion (almost two-thirds compared to just over half) but at the same time are slightly less likely to participate in organizational decisions (over half in the private sector are excluded compared to 45 percent in the public). Among technologists and those providing specialist support the pattern is reversed, with more in the public sector (just under two-thirds) than the private (half) designing their work all or most of the time and exclusion from decision-making about even. For engineers, being in the private or public sector doesn’t seem to matter for discretionary opportunities, but the quarter of engineers who work in the public sector do enjoy greater involvement in decision-making (just 15 percent report no participation) compared to private sector engineers (a third report no participation). It is unclear here or in my interviews why this would be so. Speculatively, it could be the type of engineer employed in each sector with public sector engineers tending to be civil engineers who traditionally enjoy greater status and power, and private sector engineers tending to be mechanical engineers more fully embedded within organizational hierarchies. In any case, this issue deserves further research.
**Table H3. Employment by Sector, Opportunity to Design Work, and Exclusion from Organizational Decisions by Occupational Group, Select Specialist Employees, 2004**

<table>
<thead>
<tr>
<th>Specialist Group</th>
<th>Distribution of Specialist Group</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Managers</td>
<td>Private %</td>
<td>56</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>45</td>
<td>69</td>
</tr>
<tr>
<td>Accountants &amp; Business Analysts</td>
<td>Private %</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>33</td>
<td>65</td>
</tr>
<tr>
<td>Engineers</td>
<td>Private %</td>
<td>76</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>25</td>
<td>69</td>
</tr>
<tr>
<td>IT Workers</td>
<td>Private %</td>
<td>69</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>31</td>
<td>55</td>
</tr>
<tr>
<td>Technologists &amp; Specialist Support</td>
<td>Private %</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Public %</td>
<td>52</td>
<td>63</td>
</tr>
</tbody>
</table>

**Sources:** 2004 Work and Lifelong Learning Survey (Distribution N=1,648; Discretion N=1,592; Decision N=1,592).

Table H4 provides discretion and organizational decision-making data on union or association membership for select specialist occupations. Two-thirds of managers don’t belong to an association or union, but for the fifth that are in an association there is an evident benefit. Managers in associations have slightly higher discretion but dramatically higher levels of participation in organizational decisions. Union membership appears to have a negative impact on both discretion and decision-involvement, but this could be more due to sectoral effects (e.g., service sector or industrial/manufacturing). For accountants and business analysts, like
managers, being in union or association doesn’t appear to change discretionary opportunities. However, accountants and business analysts without affiliation with a union or association are decidedly less likely to participate in decision-making. Part of this finding can likely be explained by role of the status and career advancement that comes from achieving one of the “accountant” credentials (e.g., Chartered Business Accountant). The sample does not allow further distinction between accountants and business analysts. Around 40 percent of engineers are part of an association, just over a third have no membership, and a fifth are part of a union. Engineers in an association (nearly all of whom would possess their P.Eng) have more discretionary opportunities (three-quarters design work all or most of the time) and are less excluded from decision-making least (only a fifth). Engineers with no membership have high discretionary opportunities but almost 40 percent have no involvement in organizational decision-making. The distribution, discretion, and decision-making findings for the engineers contrast with IT workers in important ways. Nearly two-thirds of IT workers have no membership, just under 30 percent are in a union, and less than 10 percent are part of an association. If we omit the discretionary and decision-making findings for IT workers in associations because of the small sample size, a comparison of unionized and non-unionized IT workers reveals that discretion is about the same (around 60 percent in both groups report designing their work all or most of the time) but that unionized IT workers are quite a bit more likely to be involved in organizational decisions (40 percent are excluded) than non-unionized IT workers (56 percent are excluded). This finding
suggests that employers do not delegate authority to IT workers in the same way they delegate to engineers.
Table H4. Employment by Sector, Opportunity to Design Work, and Exclusion from Organizational Decisions by Occupational Group, Select Specialist Employees, 2004

<table>
<thead>
<tr>
<th>Specialist Managers</th>
<th>Distribution of Specialist Occupation</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Union %</td>
<td>15</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Association %</td>
<td>21</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Neither %</td>
<td>64</td>
<td>68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accountants &amp; Business Analysts</th>
<th>Distribution of Specialist Occupation</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Union %</td>
<td>19</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Association %</td>
<td>23</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Neither %</td>
<td>58</td>
<td>67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engineers</th>
<th>Distribution of Specialist Occupation</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Union %</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Association %</td>
<td>42</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Neither %</td>
<td>37</td>
<td>68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT Workers</th>
<th>Distribution of Specialist Occupation</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Union %</td>
<td>29</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Association %</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Neither %</td>
<td>63</td>
<td>59</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Technol. &amp; Specialist Support</th>
<th>Distribution of Specialist Occupation</th>
<th>Design Work All or Most of the Time</th>
<th>No Participation in Organizational Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Union %</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Association %</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Neither %</td>
<td>40</td>
<td>55</td>
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</table>

Sources: 2004 Work and Lifelong Learning Survey (Distribution N=1,706; Discretion N=1,529; Decision N=1,481).


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