Exploring Ontario’s Secondary School Reading Achievement Gap: A Longitudinal Examination of Contributing Factors to the Academic - Applied Literacy Divide

by

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A thesis submitted in conformity with the requirements for the degree of Master of Arts
Applied Psychology and Human Development
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Abstract

Although provincial literacy scores in Ontario have remained relatively consistent over the past few years, provincial averages conceal some concerning trends, where students are performing differently based on placement within applied and academic courses. This study takes a longitudinal look at provincial level data, tracking students from grade three to create a more cohesive understanding of student profiles with reading difficulties. The link between demographic differences, home reading behaviour and achievement differences was explored. Findings suggest student performance on the grade three provincial test can predict subsequent enrollment within applied/academic streams in secondary school. Student trajectories across all three testing years were examined, indicating markedly different experiences between applied students, who were most likely to fail all three tests, and academic students, who were most likely to pass all three tests. These findings suggest the need for more targeted approaches to student reading challenges from as early as grade three.
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1 Introduction

1.1 Statement of Problem

“Reading is one of the signature accomplishments of childhood—a skill that is necessary for success in school and throughout life” (Reschly, 2010, p. 68). A significant emphasis has been placed on early literacy and providing support to elementary students to develop a strong literacy knowledge base (Cantrell, Almasi, Carter, Rintamaa, & Madden, 2010; National Reading Panel, 2000). This stems from a thrust towards research and policy which emphasize the importance of investing in early childhood intervention (Heckman, 2006; Reynolds, 2005). Despite such early efforts, however, some students demonstrate a decline in reading ability as they progress to increasingly complex disciplinary content through the education system (Snow, 2002), suggesting the critical importance of investigating literacy beyond the elementary school level. However, such an investigation is complicated by the fact that high school students are faced with a myriad of complex and multifaceted factors impacting their abilities, thus emphasizing the need for “careful consideration of contextual factors from immediate and distant environments” (Jang, 2014, p. 142), while examining contributing factors at this point in a student’s academic trajectory. Although a growing body of literature seeks to better understand the nature of student struggle at the secondary level, much ambiguity remains. The present study is aimed to fill in that gap by taking a more comprehensive, longitudinal approach by tracking student reading experiences from elementary school through to secondary school.

In Ontario, scores on the provincial level assessment, the Ontario Secondary School Literacy Test (OSSLT), have remained remarkably consistent over the past five years, with approximately 93% of students taking the test, 77% of whom demonstrate success and 16% of whom are unsuccessful (Education Quality and Accountability Office [EQAO], 2015b). Additionally, data from the International Association for the Evaluation of Educational Achievement’s (IEA), Progress in International Reading Literacy Study (PIRLS) (which examines fourth grade reading achievement) suggests that in regards to achievement internationally, “Ontario is among the top jurisdictions with respect to the percentage of students at the Advanced and High benchmarks” (EQAO, 2011, P.6). It is only when we dig a bit deeper, however, that significant incongruities with these findings become apparent. Although Ontario students enrolled in academic English courses have demonstrated consistently high rates of
success over the past five years, ranging from 93% in 2010 to 91% in 2014, these scores lie in stark contrast to students enrolled in applied English courses, who have experienced a 5% decrease in their substantially lower scores over the past five years, ranging from 50% in 2010 to 45% in 2014 (EQAO, 2015b).

Such findings validate the importance of taking a more nuanced approach towards understanding adolescent literacy performance, and the importance of digging deeper to examine the performance of subgroups within the population level data. This study seeks to explore adolescent literacy in Ontario, with particular focus placed on the divergent experiences of applied and academic students, in order to better understand challenges faced by adolescent literacy learners. This will be accomplished by performing an in-depth, longitudinal analysis of the provincial data consisting of students’ OSSLT performance and their responses to an accompanying background questionnaire, to investigate which students are struggling with reading and explore the potential contributing factors. Implications and recommendations drawn from the work will be discussed.

1.2 Context of the Study

The context of this study involves secondary school readers in Ontario. As Canada’s most populated province, the Ontario Ministry of Education oversees the education of approximately 700,000 secondary students at 913 secondary schools, as well as the employment of approximately 44,600 secondary school teachers (Ontario Ministry of Education [MOE], 2014b). In 1999, Ontario eliminated student streaming as a method of assigning students to classes, suggesting that it was a discriminatory practice and that students were being separated largely by race and income (People for Education, 2013). The revised system incorporates choice, where students can select academic or applied courses in English (as well as science, math, geography, history and French) (Zegarac & Franz, 2007). These classes differ in their points of emphasis; academic classes focus on higher-level academic thinking, while applied classes provide a more practical approach to education (Zegarac & Franz, 2007). However, few students opt to combine applied and academic courses and the resulting divide resembles the student streaming structure from the 1990’s, with students in applied courses sharing certain common characteristics: parents with lower education (parents who are 2.5 times more likely not to have completed high school
and 2 out of 3 times less likely to have gone to university), lower income (averaging half the income of academic students), as well as making up particular racial profiles (3.7 times more likely to include Aboriginal students and twice as likely to include English Language Learners) (People for Education, 2013). Despite policy shifts enacting the removal of streaming, this practice appears to persist. Furthermore, significant disparities can be seen in test results on the OSSLT for these groups of students. In 2014, 91% of academic English students passed the OSSLT while only 45% of applied English students were successful (EQAO, 2015b). Disparities associated with the Ontario provincial structure will be considered during the study in order to understand how these contextual factors may contribute to struggling reader outcomes, and to inform future recommendations specific to the Ontario context.

1.3 Research Questions

In order to investigate adolescent literacy in Ontario, this study will explore the following research questions:

1. What are the demographic differences between grade ten students enrolled in applied vs. academic achievement level English courses?

2. What are the differences in home reading behaviours between applied and academic students?

3. What are the achievement differences between applied and academic students?

4. What early indicators effectively predict secondary-school students’ future enrollment in applied and academic level achievement courses?

5. What is the distribution of possible student trajectories across testing years?
2 Literature Review

With increasingly complex reading demands at the secondary level, accompanied by significant achievement gaps, particularly evident within the current practice of student grouping into applied and academic courses, further research is necessary to address the substantial literacy challenges in Ontario’s education system. In answering the above outlined research questions, this work aims to expand upon our current understanding of known demographic factors related to literacy, home literacy activities and their effect on reading achievement, the effects of student grouping in education, and what we currently know about adolescent readers and early indicators of achievement. This section will review the literature regarding these issues, while highlighting the significance of this research.

2.1 Known Demographic Factors Related to Literacy Achievement

This literature review will focus on demographic factors related to cultural background, language and gender, as these factors are most relevant to the ensuing study. It is important to acknowledge, however, that a vast amount of literature suggests a strong relationship between lower socioeconomic status (SES) and poorer student outcomes (Bowey, 1995; Noble, McCandliss, & Farah, 2007; Powney 1996; Reeves & Howard, 2013), including reports highlighting this relationship among Ontario’s applied and academic students (People for Education, 2013). Within this review, however, SES will not be of primary focus, but rather discussed as it interacts with other factors, as SES information was not available for analysis within the data set.

2.1.1 Cultural Background and Language

Investigation into the area of educational equality most famously dates back to the 1966 Equality of Educational Opportunity report, prepared in response to the civil rights act of 1964 in the United States (Coleman, 1966). This report investigated racial segregation and equal education opportunities experienced by minority groups within the public school system (Coleman, 1966). Findings from the report indicated that differences in school quality and features were not as important as a student’s background and the background of their peers within their schools. This
resulted in a thrust towards racial integration in education. However, Johnson (2002) states, “Despite countless school reform efforts during the last two decades of the 20th century, we begin the 21st century with continuing gaps in academic achievement among different groups of students. The gaps in achievement appear by income and by race and ethnicity” (p. 4). Not only do such gaps in achievement persist, but also, they begin in elementary school and continue into secondary education, with one palpable indicator being the overrepresentation of minority students in special education (Johnson, 2002). Many studies point to SES as having the most significant impact on academic performance (Bradley & Corwyn, 2002; Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003; Powney, 1996), with some authors suggesting that experiences may play a mediating role in SES differences in neurocognitive performance (Noble, McCandliss, & Farah, 2007), and yet despite such arguments, other researchers have found that academic outcomes related to race and ethnicity have been found to persist regardless of socioeconomic status, suggesting the need for a more complex explanation for such disparities (Johnson, 2002; Losen & Orfield, 2002). Differences in racial profiles have also been noted between applied and academic students in Ontario, where applied students include a higher number of immigrants, English language learners (ELL) and students identified as Aboriginal (People for Education, 2013).

When analyzing student literacy outcomes, it is particularly essential to consider the experiences of ELLs. In Adesope, Lavin, Thompson and Ungerleider’s (2010) meta analysis of pedagogical strategies for ELL learners, they state, “Learning in a second language presents a unique set of challenges, but it is unclear whether ESL immigrant students do or do not face particular obstacles in school” (p.630). The authors highlight some of the contradictory findings regarding ELL performance within the literature, including students performing poorly on international tests, performing worse on reading and writing but not math, performing at or above the level of non-immigrants across subjects, being less likely to drop out and more likely to go on to secondary studies (Adesope, Lavin, Thompson, & Ungerleider, 2010). Exploring psychosocial factors, Fuligni (1997) found a strong relationship between immigrant parents and higher expectations of academic success. As well, he found a strong emphasis placed on education among immigrant peers. These factors were thought to contribute to findings that students performed “as well as if not better than their counterparts from native-born families” (Fuligni, 1997, p. 362). Jang, Dunlop, Wagner, Kim and Gu (2013) also noted differences in
reading achievement growth patterns between ELLs and Canadian born ELLs, where “Earlier gaps in their reading achievement disappear the longer they reside in the target language community” (p. 400). Finally, Thiessen (2007) discussed the complexity of immigrant achievement, noting that “children of immigrants whose parents speak English or French perform at least as well as children of native-born Canadians, while children whose immigrant parents speak neither official language performed worse in reading and writing. However, the academic performance of even these children caught up with that of native-born children by about the end of primary school” (p. 4). Due to the complex, heterogeneous nature of the ELL group, findings regarding student outcomes are inconsistent.

As Canada’s linguistic diversity continues to expand, it is particularly important to consider the educational experiences of students who are ELLs. ELLs within Ontario schools make up approximately 6% of school populations, an increase of two percent over the past five years (EQAO, 2015b; People for Education, 2015). Where 77% of all Ontario students passed the OSSLT in 2014-2015, ELLs experienced a significantly lower success rate of 54% (EQAO, 2015b).

Fairness and validity issues have been raised in a number of studies examining ELL students and high-stakes, large-scale assessments (Abedi, Hofstetter, & Lord, 2004; Solano-Flores & Trumbull, 2003). In a study by Fox and Cheng (2007) using focus groups to examine differences between students who spoke English as a first language (L1) and those who spoke English as a second Language (L2), they found five areas of differences in experience on the OSSLT between groups: test constructs measured (L2 learners, unlike L1 learners, felt that reading behaviour on the OSSLT differed from that experienced in class); knowledge/familiarity of test genre (L2 learners were less familiar with the test genre and related test-wise strategies); preparation for the test (L2s described experiencing inconsistent test prep, where some were provided with basic information about the test and others received extended practice with commercial testing products); emotional investment (L2 test takers were more concerned after test completion, demonstrating lower confidence and self-efficacy than L1 students); and fairness (L2s did not want to be treated differently by being given extra time accommodations, but did wish to be permitted English dictionary use). Kim and Jang (2009) also investigated ELL experiences on the OSSLT, looking specifically at differential functioning of reading sub-skills. They found that although L1 students were more successful with questions requiring vocabulary
knowledge, ELL students excelled in areas assessing grammatical knowledge and integrated reading and writing skills. Both studies highlight the dissimilarities between test takers’ experiences on the OSSLT for L1 and L2 students. Successful efforts to mitigate differences in performance between students of different cultural backgrounds in schools have included setting high expectations, improving teachers’ cultural competencies, enhancing curriculum content, and continuous monitoring of efforts utilizing data (Johnson, 2002). The success of these assorted efforts, as well as disparities in the literature regarding the relationship between background, language and academic outcome re-emphasize the complexity of this relationship and highlight the need to better understand contributing factors, particularly within Ontario’s diverse context.

2.1.2 Gender

As part of the School Achievement Indicators Programme (SAIP) in 1994, the Council of Ministers of Education, Canada (CMEC) investigated gender differences found in literacy education. Their findings suggested significant differences between male and female literacy performance, where female students outperformed males at both 13 and 16 years old (Gambell & Hunter, 2000). These findings were mirrored across a number of provinces involved in the analysis, including Quebec, British Columbia, Saskatchewan and the Atlantic provinces, as well as internationally (Gambell & Hunter, 2000). More recent reports by the Organisation for Economic Co-operation and Development (OECD) 2014 Programme for International Student Assessment (PISA) note that despite males outperforming females in mathematics, “Girls outperform boys in reading in all countries and economies by the equivalent of one year of school” (OECD, 2014, p.1). According to the OECD, the gender gap in reading is largest between the lowest performing 10% of students, and diminishes with higher performance (OECD, 2014). These findings are somewhat similar to Ostrosky, Qunitanar, Meneses, Canseco, Navarro, and Ardila (1985) who noted interactions between cognitive abilities and education levels where disparities were found among those with the least amount of education, and these disparities diminished with increased education, disappearing with 10 or more years of schooling. Interestingly, Gray, Peng, Steward, and Thomas (2004) came to the opposite conclusion when examining student performance on the British General Certificate of Secondary Education examinations, where lower performance was associated with smaller gaps in gender. Further complicating the matter, some studies have found no difference between genders on reading performance (Davies & Brember, 1999).
Analyses regarding gender differences in academic performance more broadly have been numerous, however, have not yet succeeded in painting a clear and consistent picture regarding differences and contributing factors. Studies have investigated a variety of potential factors falling into the categories of biological differences and environmental/social factors. Cognitive difference between genders is one area that has received some attention, particularly of relevance, studies suggesting differences in verbal ability between males and females, where females outperform males. However, in Hyde and Linn’s (1988) meta analyses examining gender differences, they found that such differences in various components of verbal processing were, if anything, small and insubstantial, as well as in certain instances, mixed, with males outperforming females. In 2007, Halpern, Benbow, Geary, Gur, Hyde and Gernsbacher noted slight verbal advantages for females over males, but found experience to play a much more significant role in outcomes. In a later study by Hyde (2005), she found effect size differences between genders to be small to negligible regarding cognition, including communication style, social and personality factors, and moral reasoning. Still further studies have reported finding language differences, including women having faster language development, broader vocabulary, more accurate speech production, better fluency and being more skilled at word list learning then males (Ardila, Rosselli, Matute, & Inozemtseva, 2011). Underlying differences in neurological structures and hormone function leading to brain differentiation has been suggested as a potential explanatory factor for such gender differences (Ardila, Rosselli, Matute, & Inozemtseva, 2011). Wallentin (2009) emphasizes the importance of considering developmental aspects related to gender, stating:

A small but consistent female advantage is found in early language development. But this seems to disappear during childhood. In adults, sex differences in verbal abilities and in brain structure and function related to language processing are not readily identified. If they exist, they are not easily picked up with the research methods used today. (p. 181)

In Powney’s (1996) extensive review of gender attainment commissioned by the Scottish Office Education and Industry Department, she examined a significant body of literature regarding gender differences and potential explanatory factors, including those related to biological explanations, assessment (changing test population, homogeneity of variance, issues of validity/bias, mode of assessment, gender differences in approaches to learning, features assessed over time), and environmental explanations (home, school, systems and society).
Powney’s (1996) findings suggest that although historically there has been a considerable focus on the impact of biological factors such as differences in maturation rates, where females mature faster thus experience advantages in language development, these findings may in fact have less impact than environmental factors. Powney (1996) presents a number of assessment-related factors in need of further exploration. These include: higher levels of variability found in male performance outcomes than females; test validity and bias issues potentially favouring one gender over another; differences in responses to assessment modes where females excel on course work and essay type questions and males do better on multiple choice questions; differences in self-confidence where males are more willing to take risks (e.g. females are more likely than males to select “don’t know” on multiple choice answers); and differing attitudes towards academic activities (e.g. females are more positive towards reading where males are more positive about math and sciences). With regards to environmental factors and gender, Powney’s review also indicated strong relationships between parental attitudes, parental education levels, poverty and student performance. Other avenues of research have examined differing expectations for males and females at school, where students are “socialised into stereotypical gender roles and behaviour through reading materials, differential access to toys and play material and pupil-teacher interaction” (Powney, 1996, p. 55).

Strategies that have been employed by educators to target gender disparities have included organizational strategies (shift in culture of school towards emphasis on achievement), individual approaches (setting individualized targets, data collection, monitoring and feedback, mentoring), pedagogical strategies (adjusting classroom dynamics and teaching styles), and socio-cultural approaches (encouraging males to be comfortable/take pride in learning, using role models/leaders as examples) (Klinger, Shulha, & Wade-Woolley, 2009). Powney (1996) states, “the factors are cumulative for each individual and it is not sufficient to address only one or two to produce satisfactory comprehensive explanations for any gender differences” (p. 52).

Although we know that demographic factors related to ethnicity, language and gender all impact student academic experiences, due to the interrelatedness of the many variables at play, understanding the significance and nature of this impact is incredibly complex and further studies are necessary in order to show the clear and definitive links between these factors.
2.2 Home Literacy Activities and their Effects on Reading Achievement

The impact of early literacy activities has been well documented in the literature, suggesting positive correlations between early exposure to reading and receptive language abilities (DeBaryshe, 1993), rate of language development (August & Shanahan, 2006), receptive vocabulary and vocabulary acquisition (Bus, Van Ijzendoorn, & Pellegrini, 1995; Senechal & Cornell, 1993) reading ability (Scarborough, Dobrich, & Hager, 1991) and advanced comprehension skills (Mol & Bus, 2011). In their meta-analysis investigating the longitudinal effects of print exposure, Mol and Bus (2011) proposed that “an early start of shared book reading sets in motion a causal spiral, in which print exposure stimulates language and reading development, which, in turn, stimulates the quantity of print exposure” (p. 285). This reciprocal relationship is thought to lead to “growing interindividual differences” (Mol & Bus, 2011, p. 285), termed in much of the literature as the “Matthew effect” (Bast & Reitsma, 1998; Foster & Miller, 2007; Penno, Wilkinson, & Moore, 2002; Stanovich, 1986). As students progress through the school system, however, especially after grade four, the text type that they are predominantly exposed to shifts from a primary focus on fiction, towards a focus on expository texts, technical texts and textbooks (Mol & Bus, 2011). At the same time, it has also been noted that daily reading typically decreases as students progress into adolescence. Among Ontario grade six students, a decline of 15% in those reporting an interest in reading was found from 1999 to 2011 (People for Education, 2011). The National Centre for Education Statistics noted similar trends, reporting that 53% of 9 year olds, but only 19% of 17 year olds read daily. Additionally, they found an overall decrease from 64% to 40% among 17 year olds reading for pleasure once a week (National Centre for Education Statistics [NCES], 2013).

Hopper (2005) as well as Moje, Overby, Tysvaer, and Morris (2008) also explored the topic of adolescent literacy habits, arriving at alternate conclusions, contradicting the prevalent literature indicating a decrease in reading rates among students. Hopper (2005) found that “the patterns of what adolescents select for their private reading over recent decades have remained relatively stable” (p. 113). Moje, Overby, Tysvaer, and Morris (2008) also found high rates of reading when surveying 716 youth, where 92% were found to read texts outside of school three to four times a week. The authors suggested that a more inclusive understanding of text is necessary in order to accurately capture the extent of adolescent reading behaviour (Moje,
Overby, Tysvaer, & Morris, 2008). Similarly, Hopper (2005) stressed the importance of being inclusive of “vernacular literacies”, for example, computer, magazines, newspapers and comics. Moje, Overby, Tysvaer, and Morris’ (2008) analysis revealed that the top six most popular reading types among students surveyed were: websites, letters/notes, music lyrics, emails, magazines and novels. Additionally, both studies noted gender differences between males and females in time spent reading various text types and type of content read (Hopper 2005; Moje, Overby, Tysvaer, & Morris, 2008).

The impact of these findings is particularly of interest when considering Sullivan and Brown’s (2013) work investigating the reading behaviour of 6,000 students, ages 10-16. The authors found that students who read for pleasure did significantly better in school, demonstrating more progress made in vocabulary development, as well as spelling and math compared to those who rarely read (Sullivan & Brown, 2013). Additionally, results suggested that reading for pleasure was four times more important for student cognitive development than parent education level (having a degree) (Sullivan & Brown, 2013). This finding is similar to Clark and Akerman (2006) who noted that “although socio-economic status has an impact on educational achievement, there is evidence to suggest that engagement in reading can “compensate” for low family income and educational background.” Mol and Bus (2011), also found positive relationships with print exposure among high school students, explaining 30% of the variance in oral language as well as a significant variance in basic reading skills, particularly for those students who demonstrated lower ability levels. That is, “poor readers basic reading skills profit most from reading books in their leisure time” (Mol & Bus, 2011, p. 289).

The current study will build on these findings within the Ontario context, in order to better understand who is engaging in reading outside of school, the nature of what students are reading, and how their home reading behaviour might impact their literacy performance.

2.3 Effects of Grouping Students in Education

2.3.1 Achievement Grouping Structure in Ontario

Significant achievement gaps have been found at the secondary level within Ontario’s current education system structure between students participating in applied English curriculum and
those participating in academic English curriculum (People for Education, 2013). Debates regarding achievement grouping of students have persisted into the 21st century, with proponents who argue that such grouping has negative effects on student outcomes, (Maaz, Trautwein, Lüdtke, & Baumert, 2008; Trautwein, Lüdtke, Marsh, Koller, & Baumert, 2006; Tach & Farkas, 2006) and those who argue for the merits of grouping students based on ability (Hong, Corter, Hong & Pelletier, 2012; Slavin, 1990). In the Ontario public school system, students are grouped within schools by courses, provided the option to participate in different levels across courses, however, in practice, the majority of students typically attend all subjects within the same achievement level. People for Education (2013) notes that

Students can opt to mix and match applied, academic, locally developed, and open courses, but data from the Ontario Ministry of Education shows that the majority of students (62%) taking Grade 9 applied math are taking three or more applied courses. Only 10% of students take applied math and no other applied courses. (p.2)

Additionally, from a 2012-13 survey of 200 secondary school principals, they found that “91% of principals report students transfer from applied to academic courses “never” or “not very often” (People for Education, 2013, p. 2). Therefore, despite the option to combine courses of varying levels, the result is effectively a streamed system, with a distinct divide where the majority of students take all applied courses or all academic courses.

2.3.2 Achievement Grouping and Socioeconomic Status (SES)

The debate regarding research on achievement grouping has often focused on student SES and related factors. Notably, PISA found “positive relationships between family SES and students’ reading, mathematics, and science literacy in all participating countries.” (Maaz et al., 2008, p.99). Tach and Farkas (2006) explored SES in their study investigating American students entering the school system, stating that “early ability grouping has been identified by sociologists of education as a key beginning point for understanding the mechanisms by which schools act to transmit social class status from parent to child” (p. 1050). They also reported stronger effects found particularly in reading when young students were grouped by ability level (Tach & Farkas, 2006). In Maaz et al.’s (2008) investigation of the German secondary school system, a system where students are streamed into distinct tracks after grades four to six, the authors suggested two main factors related to SES influenced student achievement disparities and ultimately,
impacted student educational trajectories: secondary tracks are associated with social background even when controlling for achievement indicators, and tracks represent “differential developmental environments with higher learning rates in the high tracks” (p. 99). Therefore, student background directly impacted which track secondary school students ended up in, which in turn led to more or less advantageous learning environments. In Baumert and Schümer’s (2001) study, they found that “Even when basic cognitive abilities and the knowledge and skills acquired at school were controlled, the effects of social background remained predictive” (Maaz et al., 2008, p.102). The potential SES related streaming effects are therefore essential to consider when evaluating educational environments. Within the Ontario context, differences in student background between academic and applied students have been explored, finding markers of lower SES among applied students, including lower family income, more households classified as living in poverty (two children with an income less than $27,000), and lower parent education (fewer high school diplomas and university degrees) (People for Education, 2013).

2.3.3 Achievement Grouping and Social-Psychological Factors

Critiques of streaming often focus on disadvantages experienced by students in low-achievement groupings, citing three potential negative outcomes for such students: instructional effects (related to quantity, quality and pace), teacher and parent perceptions and expectations and social-psychological effects (development of norms, social comparison and expectations) (Pallas, Entwisle, Alexander, & Stluka, 1994; Trautwain et al., 2006).

A number of studies have looked in further detail at the impact of achievement grouping on student social-psychological factors such as self-esteem, motivation, and self-concept, largely focusing on social comparisons made by students (Chiu et al., 2008; Ireson, Hallam, & Plewis, 2001; Trautwain et al., 2006; Van Houtte, Demanet, & Stevens, 2012). The assimilation effect and contrast effect are often cited as theories supporting opposing arguments of this debate. The assimilation effect suggests that grouping students leads to “enhance student motivation in higher tracks and undermine it in lower ones” (Trautwain et al., 2006. P. 788), that is, students’ motivation is affected, either negatively or positively, by the motivation within one’s immediate peer group. Alternately, the contrast effect suggests that grouping leads to students making “less favorable comparisons in high-achieving groups and to more favorable comparisons in low-achieving groups” regarding their own ability (Trautwain et al., 2006, P. 788), that is, when peers
are operating at a higher level, students assess their abilities more negatively in comparison than if peers are operating at a lower level. Regardless of which theory is more accurate, both theories posit that grouping students leads to a result where one group suffers from the negative outcome of social comparison, leading to lower motivation and poorer self-concept. Another avenue explored has been the relationship between student effort and grouping structure. Carbonaro (2005) found a relationship between higher achievement group tracks and higher levels of effort exerted by students. These findings suggest the importance of being cognizant of the many potential factors related to grouping beyond academic performance.

2.3.4 Achievement Grouping across the Developmental Trajectory

When considering the effects of grouping students, researchers have also explored at what point in a student’s academic trajectory grouping might have more profound impact. Hong et al. (2012) examined ability grouping for 21,260 American kindergartners from the Early Childhood Longitudinal Study, Kindergarten Class data (1998-99). The study focused on literacy learning, finding that ability grouping within classes was beneficial even to lower achievement groups as long as it was accompanied by a minimum amount of literacy instruction (Hong et al., 2012). Pallas et al. (1994) examined 756 first grade students in Baltimore city, finding similarly strong evidence of instructional effects, but not of social and institutional effects. In this case, however, the authors recommended against grouping students, stating, “We found that children with relatively similar levels of measured academic potential were frequently placed in different first-grade reading groups and that children in higher ranked instructional groups learned more and received higher grades than did children in lower-ranked groups. In this sense, instructional grouping may have the unintended effect of increasing inequalities in educational outcomes, largely by creating inequalities in educational resources and rewards” (Pallas et al., 1994, p.43).

In Hanushek and Wößmann’s (2006) study investigating 45 countries using international testing scores, they suggested that there were “unequalizing effects” of early educational tracking on later student performance. The authors analyzed who is most affected by the streaming structure, and found that “lower performers suffer more from early tracking than higher ones,” however, “in no case do some students gain at the expense of others; both high and low achievers lose” (Hanushek & Wößmann, 2006, p. C74). Additionally, when looking at specific subjects, Hanushek and Wößmann (2006) found a statistically significant lower achievement related to early tracking associated with reading. Canada, considered a late tracking country, where
students aren’t streamed until secondary school, fit into “the bottom six countries with the largest decrease in inequality” based on standard deviation scores from elementary to secondary school (Hanushek & Wößmann, 2006, p. C69).

The literature suggests mixed findings internationally regarding the strengths and weaknesses of grouping students, and what particular factors might have the most significant impact. This study seeks to explore this topic further, shedding light on the impact of achievement grouping as it relates to grouping at the secondary level within the Ontario context.

2.4 Adolescent Reading

2.4.1 Reading Challenges Experienced in Adolescence

Historically, research in the area of literacy has focused on elementary and beginning readers, with less emphasis placed on the challenges experienced by high school students. However, adolescent literacy is increasingly emerging as a significant concern among educators (EQAO, 2014, Snow, 2002), a time when students are met with increasingly complex disciplinary texts (Cantrell et al., 2010). Jang (2014) notes, “As language learners move from grade to grade, they continue to develop academic language proficiency and confront language demands in increasingly specialized content areas” (p. 78). Additionally, positive attitudes towards both academic and recreational reading have been found to decrease as students progress through the education system (Eccles, 1993; McKenna, Kear, & Ellsworth, 1995). This is also a time in the student trajectory where motivation and engagement have a significant impact on student performance (Klauda & Guthrie, 2014). With such demanding antecedent factors, the difficulties faced by struggling readers at this level are complex and multifaceted. Despite a growing body of literature addressing these issues, questions regarding the nature of secondary student difficulties with literacy persist. Studies point to psychological factors of student motivation, affect and engagement (Casey, 2008; Fulmer & Tulis, 2013; Klauda & Guthrie, 2014; Melekoglu, 2011). Other work attempts to identify specific subsets (e.g. phonemic awareness, fluency, vocabulary, comprehension) of reading skills as the source of student challenges (Dennis, 2012; Kendeou, van den Broek, Helder, & Karlsson, 2014; Paris, 2005;). Additional studies look at teacher
instruction and effectiveness of teaching strategies (Cantrell et al., 2010; Hong-Nam, Leavell, & Maher, 2014; Scammacca, Roberts, Vaughan, & Stuebing, 2013).

In Hattie’s (1999) synthesis of meta-analyses regarding influences on student achievement, of the over 100 factors influencing educational outcomes (including factors related to school, home, curriculum) teacher schooling had an effect size of only .40. Such findings have led researchers to explore contributing factors beyond the school as a way of better understanding student reading challenges (Lenters, 2006; Mega, Ronconi, & De Beni, 2014; Melekoglu, 2011). Some of these external influences have already been explored above, including demographic factors and home literacy behaviour. However, it is clear that much ambiguity remains.

At the secondary level, the literature tends to focus less on so-called discrete reading skills such as letter identification, phonics and concepts of print, considered to be either known or not known, and instead focuses on the more complex cognitive task of comprehension, influenced by a variety of factors such as text difficulty, genre, familiarity of content and prior knowledge (Paris & Stahl, 2005). Kendeou et al. (2014) define reading comprehension as “the construction of a coherent mental representation of the text in the reader’s memory” (p. 10). The authors suggest that reading comprehension is achieved through the combination of two cognitive processes: lower level processes, “translating the written code into meaningful language units” which rely on decoding, reading fluency, and vocabulary knowledge, and higher level processes, “combining these units into a meaningful and coherent mental representation”, which involve inference making, making connections to background knowledge, executive function processes (organization and reflection of information, working memory), and attention allocation (selective attention, monitoring comprehension) (Kendeou et al., 2014, p.11). It is therefore hypothesized that reading difficulties can result from both difficulties with lower level processes and higher level processes, further adding to the complexity of understanding the nature of adolescent difficulties at the secondary level (Kendeou et al., 2014). Dennis (2012) notes, “Additional research that looks deeper into adolescents’ individual differences is needed to further develop the literature base about these students” (p.19).
2.4.2 Sub-skills Assessed on the OSSLT

Three reading sub-skills are assessed on the OSSLT: explicit understanding, implicit understanding and making connections. Explicit understanding requires the reader to locate content and refer back to the text, where information is directly stated and can be used to answer the question. For implicit understanding, answers can be found within the text, however, are not directly stated but implied, therefore requiring students to use higher level thinking skills to “read between the lines” in order to answer questions. Making connections refers to questions where broader external background knowledge and experiences outside of the text must be employed and connected to the text in order to answer questions (Virgilio, 2009). Paris and Stahl (2005) state,

To comprehend a passage, one needs to be able to decode words, relate the words to prior knowledge, and to generate situation and text models with explicit and implicit meaning. Prior experience, whether in general or with a specific text, is an important part of understanding a passage (p. 297).

In regards to sub-skill mastery, in their analysis of differences in grade six students reading achievement and mastery skill development, Jang et al. (2013) found that, 87% of the students in the population have mastered the skill associated with textually implicit comprehension whereas only 56% mastered the summarizing skill. Clearly, the inferencing and summarizing skills were proven to be more difficult than the other skills. In contrast, the textually explicit and implicit comprehension skills were shown to be relatively easier to master. (P. 417)

Leslie and Caldwell (2006), noted that stronger readers refer back to the text in order to locate explicit information, however, Israel and Duffy (2014) found that less proficient readers did not typically refer back to the text, instead relying on memory to answer explicit questions. Schema theory, specifically content schema, is often mentioned in regards to the notion of making connections. Carrell, Devine, and Eskey (1988) note that “readers activate an appropriate schema against which they try to give a text a consistent interpretation” (p.79). Student mastery of sub-skills on the OSSLT will be analyzed in the present study in order to further clarify the most significant challenges faced by secondary school readers in regards to reading comprehension.
2.4.3 Early Indicators

Despite the extensive literature regarding reading, there still remain some pivotal questions that need to be addressed, namely, when do student’s difficulties with reading begin and how do their reading profiles change over time? Fletcher-Campbell, Soler, and Reid (2009) performed a meta analysis examining 61 studies for correlations between predictor variables in kindergarten and future reading achievement. They found that nonverbal skills (e.g. visual, motor) were not connected to reading achievement, however, those skills associated with word recognition (letter identification, and phonological awareness) as well as those associated with comprehension (vocabulary, sentence/story recall and concepts of print) were all predictors of future reading performance (Fletcher-Campbell, Soler, & Reid, 2009). The authors posited that these findings suggest potential disparities regarding reading between students exist prior to the start of formal school instruction. They also noted, however, that these correlations from kindergarten were much less significant than those found to predict reading in grades one to four.

Leather and Henry (1994) found that phonological awareness and complex memory span tasks contributed to variance in cognitive ability related to reading. Other predictors that have been suggested as influencing future reading ability include letter naming ability, phonological awareness, visual-orthographic processing and visual-motor tasks (e.g. name writing and letter copying) (Badian, 1995). In Badian’s study, she found that the best predictors of future reading ability were letter naming and visual symbol matching. Roland, Good, Simmons and Kame’enui (2001) posited that phonological awareness, alphabetic understanding, and accuracy and fluency were indicators of successful reading.

It appears that a great deal of data supports the notion that early indicators can be used to predict future reading performance. What is less clear is the longitudinal perspective regarding how student profiles change over time. By tracking students from grades three to ten, this study aims to better understand not only when student difficulties with reading become evident, but also how their reading trajectories might change across the course of their academic careers.
2.5 Significance of the Study

With extensive conflicting evidence available on the topic of reading and the diverse factors influencing student literacy at the secondary level, there is still much lacking in the current literature, indicating significant gaps in current knowledge. This study will investigate the topic of adolescent literacy from a Canadian perspective, making significant contributions to our understanding of this topic within the Ontario context, an area which continues to challenge policy makers and teachers alike. By adopting a more nuanced approach in analyzing the large-scale provincial assessment data, this work will illuminate the nature of difficulty experienced by adolescent readers and shed light on the potential effects of grouping students in Ontario classrooms into applied and academic cohorts. Additionally, it will help us to better understand the complexities of the heterogeneous group of struggling readers by performing more detailed analysis looking more closely at factors related to student background, language and gender and how these factors might contribute to student reading experiences. By analyzing student home reading behaviour activities, further clarity in this area will help us to better understand the impact and importance of frequency and text types in reading. This work is unique in that it employs longitudinal tracking of a cohort of 132,787 students from grades three to grade ten, contributing a more comprehensive perspective of the developmental trajectories of students.

Although the EQAO published a report in 2014 tracking students longitudinally, little analyses were performed investigating inequalities in student outcomes in regards to literacy. A strong need therefore presents itself to perform such an analysis in order to better understand firstly, why particular students are experiencing difficulty with literacy at the secondary level as evidenced by OSSLT results and secondly, why such a significant difference in outcomes is apparent between students enrolled in academic vs. applied level English courses. Finally, findings from this work will have meaningful implications regarding how to improve practice in Ontario and generate implications for early intervention.
3 Methodology

3.1 Research Questions

The present study employed large-scale OSSLT performance data as well as longitudinal cohort data from grades three and six EQAO reading assessments and grade ten OSSLT reading assessments, spanning from 2006 to 2013. The purpose of the research was to investigate disparities in student reading performance at the secondary level based on provincial literacy scores. Specifically, the following research questions were examined:

1. What are the demographic differences between grade ten students enrolled in applied vs. academic achievement level English courses?

2. What are the differences in home reading behaviours between applied and academic students?

3. What are the achievement differences between applied and academic students?

4. What early indicators effectively predict secondary-school students’ future enrollment in applied and academic level achievement courses?

5. What is the distribution of possible student trajectories across testing years?

3.2 Participants

Participants included in the analysis were Ontario Grade ten secondary school students who completed the OSSLT in 2013 \((N = 215,889)\). Students with complete data capturing all three testing years as well as complete secondary questionnaires were selected for further analysis \((n = 132,787)\) (see Table 1). Among these students, those enrolled in applied English \((n = 28,922)\) and academic English \((n = 103,865)\) were utilized for additional focused analysis and comparison. Other key characteristics of the students examined throughout the study were gender, students with IEPs, and students enrolled in ESL classes.
Table 1. Distribution of Students by Academic and Applied Group Membership

<table>
<thead>
<tr>
<th></th>
<th>Frequency (%)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Academic</td>
<td>Applied</td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>103,865 (78)</td>
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<td></td>
</tr>
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<td>Female</td>
<td>55,885 (53.8)</td>
<td>10,545 (36.5)</td>
<td></td>
</tr>
<tr>
<td>IEP</td>
<td>10,656 (10.3)</td>
<td>12,218 (42.2)</td>
<td></td>
</tr>
<tr>
<td>ESL</td>
<td>3,719 (3.6)</td>
<td>791 (2.7)</td>
<td></td>
</tr>
<tr>
<td>English first language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7,4601 (71.8)</td>
<td>2,4291 (84.0)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2,6274 (25.3)</td>
<td>3,888 (13.4)</td>
<td></td>
</tr>
<tr>
<td>Language spoken at home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only/mostly English</td>
<td>70,661 (68.0)</td>
<td>22,689 (78.4)</td>
<td></td>
</tr>
<tr>
<td>Other language as often as English</td>
<td>21,495 (20.7)</td>
<td>3,829 (13.2)</td>
<td></td>
</tr>
<tr>
<td>Only/mostly other language</td>
<td>8,079 (7.8)</td>
<td>1,355 (4.7)</td>
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</tr>
</tbody>
</table>

3.3 Instrument

In 2001, the Education Quality and Accountability Office (EQAO) implemented mandatory provincial testing for students in grade three, six, nine and ten in order to assess the quality of education and ensure accountability within Ontario’s publicly funded education system (EQAO, 2013). Grade three and six tests assess the reading, writing and math curriculum attained by students by the end of grade three and six consecutively. The grade nine assessment of mathematics tests grade nine math curriculum knowledge and the grade ten OSSLT covers
reading and writing curriculum knowledge up to the end of grade nine. For the purposes of this study, the analysis will focus primarily on reading content from the grade three and six EQAO and grade ten OSSLT.

Across tests, three core reading skills are assessed: understanding explicitly stated information and ideas (Reading Skill one); understanding implicitly stated information and ideas (making inferences) (Reading Skill two); making connections between information and ideas in a reading selection and personal knowledge and experience (interpreting reading selections by integrating information and ideas in a reading selection and personal knowledge and experience) (Reading Skill three) (EQAO, 2007).

For the grade three and six tests, EQAO state that the assessment does not impact report card grades, but acts to provide information to teachers regarding student mastery of the curriculum while highlighting areas where students may require further supports (EQAO, 2014). Conversely, successful completion of the grade ten OSSLT is a graduate requirement in order to receive an Ontario Secondary School Diploma (OSSD) (EQAO, 2014). Students are assigned four achievement levels upon completion of testing: Level one - below the provincial standard (equivalent to a D- to D+); Level two - approaching the provincial standard (equivalent to a C- to C+); Level three - meeting the provincial standard (equivalent to a B- to B+); and Level four - exceeding the provincial standard (equivalent to an A- to A+). Additionally, students may be assigned the score NE1, meaning that there was not enough evidence provided to be assigned a level one (EQAO, 2015a). Literacy scale scores are also assigned, ranging from 200 to 400 where scoring 300 is considered meeting the provincial standard. The format for all three tests’ assessment of reading content include a combination of multiple choice and constructed-response questions with an emphasis on using a variety of texts, including, for example, poems and informational texts (EQAO, 2004).

Students are also required to complete an accompanying booklet or student questionnaire that collects a variety of demographic background information such as gender, length of time in Canada, languages spoken/heard at home, as well as information regarding home reading behaviour such as number of hours a week spent reading English materials outside of school work and types of English materials read outside of school texts (See Appendix A for the OSSLT 2013 student questionnaire). This questionnaire incorporates contextual information to “analyze
student achievement data by subgroup and to focus recommendations about improving student learning…questions reflect a number of factors that are associated with student achievement” (EQAO, 2013, p.14).

The data also include information regarding whether or not students attend English as a Second Language classes (ESL) or have been identified as having an Individual Education Plan (IEP). Mandated through the K–12 Policy for English Language Learners and ESL and ELD Programs and Services (MOE, 2007), ESL programs are “for students whose first language is other than English or is a variety of English significantly different from that used for instruction in Ontario schools” (MOE, 2007, p.22). Using ESL marker information identifies students who are attending ESL classes, however, it is important to note, this marker does not inclusively capture all English Language Learners (ELL) within the provincial system.

The Ministry is also mandated through the Individual Education Plans: Standards for Development, Program Planning, and Implementation, 2000, to provide “a written plan describing the special education program and/or services required by a particular student, based on a thorough assessment of the student’s strengths and needs – that is, the strengths and needs that affect the student’s ability to learn and to demonstrate learning” (MOE, 2004, p. 6). The IEP is provided for students identified as having an exceptionality or those enrolled in special education programs and services (MOE, 2004). This information helps to identify those students with various exceptionalities within the population, however, once again can not be considered entirely representative of all such students, as this category is quite broad, encompassing a diverse range of students (12 categories: including behaviour, autism, deaf, blind, gifted, mild intellectual, developmental, multiple, physical, speech, language, learning), and not all students with exceptionalities may have been formally provided with an IEP (MOE, 2004). However, this information will be used to provide some insight into this population subgroup.

3.4 Data Analysis

In order to answer each question, a variety of statistical analyses were performed, corresponding to the five research questions framing the study. These are illustrated in Table 2.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Analytic Procedure</th>
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</thead>
<tbody>
<tr>
<td>1. What are the demographic differences between grade ten students enrolled in</td>
<td>Descriptive statistics (Gender, IEP, ESL)</td>
</tr>
<tr>
<td>applied vs. academic achievement level English courses?</td>
<td>Chi-Square tests</td>
</tr>
<tr>
<td>2. What are the differences in home reading behaviours between applied and</td>
<td>Latent class analysis</td>
</tr>
<tr>
<td>academic students?</td>
<td>Chi-Square test for association</td>
</tr>
<tr>
<td>3. What are the achievement differences between applied and academic students?</td>
<td>Descriptive Statistics</td>
</tr>
<tr>
<td></td>
<td>Sub-skill analysis (Explicit, Implicit, Making Connections)</td>
</tr>
<tr>
<td>4. What early indicators effectively predict secondary-school students’ future</td>
<td>Hierarchical regression analysis</td>
</tr>
<tr>
<td>enrollment in applied and academic level achievement courses?</td>
<td></td>
</tr>
<tr>
<td>5. What is the distribution of possible student trajectories across testing years?</td>
<td>Longitudinal student trajectory tracking analysis</td>
</tr>
</tbody>
</table>

The OSSLT data was analyzed using SPSS v.22 and Mplus v. 7.11. Descriptive statistics and Chi-square tests were performed in SPSS in order to explore differences in distributions between students enrolled in applied and academic courses. Specific areas of focus included
differences in gender, students enrolled in ESL and students identified as having an IEP. Subsequently, in order to develop a better understanding of the reading engagement behaviour of grade ten students, an exploratory latent class analysis (LCA) was performed using student questionnaire data in Mplus, Version 7.11 (Muthen & Muthen, 1998–2012). This approach “uses maximum likelihood estimation to fit a hypothesized model in which membership in a specified number of latent classes is related to performance on the included measures and to produce fitted probabilities of class membership for individuals” (Hock, Hock, Kieffer, Biancarosa, & Deshler, 2011, p. 443-444). As an exploratory approach, a priori constraints were not placed on the model (Mclutcheon, 1987). Further Chi-square tests for association were performed using SPSS v.22 in order to examine the characteristics of latent classes in terms of level of study (applied vs. academic), OSSLT performance, Gender, IEP, ESL and Reading frequency (hours per week).

Student achievement differences between applied and academic groups were explored using SPSS v. 22, including an analysis of differences in performance in three sub-skill areas on the OSSLT: explicit understanding, implicit understanding and making connections. SPSS v. 22 was also used to perform multiple logistic regressions in order to predict future enrollment in applied and academic achievement grouping from grade three EQAO test performance. The first regression examined demographic information and reading behaviour (research questions one and two) in a two-step hierarchical regression with gender, IEP and ESL entered in step one and LCA entered in step two to predict level of study (applied, academic). The second regression looked at the ability to predict level of study based on grade three test results.

The final analysis performed utilized information from all three testing years (grade three, six and ten), mapping out the six possible trajectories of passing and failing tests. Passes were indicated using the number 1 and fails using the number 0, thus creating three digit codes for each possible trajectory (e.g. 0-0-0 for students who failed all three tests, 0-1-1 for students who failed grade three, passed grade six and passed the OSSLT). This longitudinal data was analyzed in a number of ways in order to better understand patterns of student trajectories for applied and academic students, males and females, students with an IEP and students in ESL.
4 Results

This chapter presents the results of the five research questions guiding the study:

1. What are the demographic differences between grade ten students enrolled in applied vs. academic achievement level English courses?

2. What are the differences in home reading behaviours between applied and academic students?

3. What are the achievement differences between applied and academic students?

4. What early indicators effectively predict secondary-school students’ future enrollment in applied and academic level achievement courses?

5. What is the distribution of possible student trajectories across testing years?

4.1 What are the demographic differences between grade ten students enrolled in applied vs. academic achievement level English courses?

In order to better understand the underlying differences between students enrolled in applied English courses compared to those enrolled in academic English courses, demographic differences between the two groups were examined, specifically looking at gender, ESL status and IEP status. Descriptive statistics were performed, as shown in Table 3, indicating demographic differences between the groups. The composition of males and females differed between groups, where a higher percentage of females (53.8%) than males were in academic English and conversely, a higher percentage of males (63.5%) than females were in applied English. Students also differed regarding the presence of an IEP, with a higher percentage of applied students having an IEP (42.2%) than academic students (10.3%). Finally, a higher percentage of students in ESL were in the academic group (3.6%) compared to the applied group (2.7%). Taken together, academic students had a higher membership of females, a lower membership of students with an IEP and a higher membership of ESL students when compared
to applied students who included a higher percentage of male students, higher number of students with an IEP and fewer ESL students.

Table 3. Demographic Information for Academic and Applied Students (n = 132,787)

<table>
<thead>
<tr>
<th>Frequency (%)</th>
<th>Academic</th>
<th>Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>103,865 (78)</td>
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<td>3,719 (3.6)</td>
<td>791 (2.7)</td>
</tr>
</tbody>
</table>

A chi-square test was conducted in order to determine the significance of the differences in composition of applied and academic groups regarding gender, IEP and ESL. As seen in Table 4, statistically significant differences were found for all three categories for both groups, indicating an association between applied or academic grouping (level of study) and background variables. ESL students tended to be in the academic stream more than the applied stream ($\chi^2(1) = 732.991, p < .001$) whereas IEP students tended to belong to the applied stream, ($\chi^2(1) = 106.665, p < .001$). Additionally, chi-square tests looking within groups at gender differences indicated statistically significant differences in the composition of males and females for both academic students ($\chi^2(1) = 601.637, p < .001$) and applied students ($\chi^2(1) = 2120.885, p < .001$).
Table 4. *Chi-Square Goodness of fit comparing Academic and Applied student’s Gender, ESL and IEP*

<table>
<thead>
<tr>
<th></th>
<th>Gender (Academic)</th>
<th>Gender (Applied)</th>
<th>ESL</th>
<th>IEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi Square Statistic</td>
<td>601.637</td>
<td>2120.885</td>
<td>1900.928</td>
<td>106.665</td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>P-value</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

4.2 What are the differences in home reading behaviours between applied and academic students?

To develop a better understanding of the reading engagement behaviour of grade ten Ontario students, an exploratory latent class analysis (LCA) was performed using Mplus, Version 7.11 (Muthen & Muthen, 1998–2012). Six models were inputted into Mplus (two model to seven model solutions) in order to determine the best-fitting model. Nine categorical variables (non-fiction, comics, letters, magazines, manuals, newspaper, novels, poetry, religious text) were inputted to perform the latent class analysis for reading engagement. Several measures were used to evaluate the goodness of fit of the model. These included model comparison measures (Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Vuong-Lo-Mendell-Rubin test), model based measures (log-likelihood and likelihood ratio Chi squared tests), and measures of classification certainty (entropy) (Mclutcheon, 1987). The three class model provided the best-fit solution, \(\chi^2(12031, N = 165,387) = 11893.327, p = .827\) (See Table 5). This model provided better fit when comparing AIC and BIC scores to the two-class model, and had the highest entropy score across all models, indicating the clearest delineation of classes (Celeux & Soromenho, 1996). The Vuong-Lo-Mendell-Rubin test was also significant, indicating that the three-class model was superior to the two-class model (Nyland, Asparouhov, & Muthen, 2007).
Table 5. Results of Latent Class Analysis

<table>
<thead>
<tr>
<th>Models</th>
<th>AIC</th>
<th>BIC</th>
<th>Entropy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two classes</td>
<td>1841993.092</td>
<td>1842183.397</td>
<td>0.517</td>
</tr>
<tr>
<td>Three classes</td>
<td>1830410.022</td>
<td>1830700.487</td>
<td>0.676</td>
</tr>
<tr>
<td>Four classes</td>
<td>1825965.648</td>
<td>1826356.274</td>
<td>0.566</td>
</tr>
</tbody>
</table>

Note. For Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), lower scores indicate superior models. Higher entropy scores indicate superior precision of classification.

The three-class solution proposes three groups of Ontario high school students regarding reading engagement: limited engaged readers ($n = 33380, 20\%)$, middle engaged readers ($n = 121456, 73\%)$ and highly engaged readers ($n = 10551, 6\%)$ (See Figure 1).

Figure 1. Three-class solution latent class analysis of reading engagement in extra curricular activities.
The three classes were distinct, with no overlap across groups. Students in the highly engaged group were consistently the highest across all variables. Within this group, less endorsement of reading comics and religious texts was found. The medium and low engagement groups demonstrated more variability regarding what students read, however, both groups demonstrated a somewhat similar pattern, where reading of magazines, novels and poetry were most popular, and non-fiction, letters, newspapers and religious texts were less popular. Notably, the highly engaged readers had relatively less interest in reading comics compared to other reading types, where the lowest engaged readers showed relatively higher interest in reading comics compared to some other reading types. The descriptive statistics regarding demographic information (level of study, gender, ESL, IEP) of the three groups is provided in Table 6.

Table 6. Demographic Characteristics of Three Latent Classes for Reading Engagement

<table>
<thead>
<tr>
<th></th>
<th>Low Engagement</th>
<th>Medium Engagement</th>
<th>High Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied</td>
<td>5,569 (26.4)</td>
<td>14,489 (68.8)</td>
<td>1,007 (4.8)</td>
</tr>
<tr>
<td>Academic</td>
<td>16,952 (21.0)</td>
<td>59,167 (73.4)</td>
<td>4,474 (5.6)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19,365 (58)</td>
<td>59,424 (48.9)</td>
<td>5,252 (49.8)</td>
</tr>
<tr>
<td>Female</td>
<td>13,646 (40.9)</td>
<td>59,571 (49.1)</td>
<td>5,009 (47.5)</td>
</tr>
<tr>
<td>IEP</td>
<td>7,339 (22)</td>
<td>25,364 (20.9)</td>
<td>2,207 (20.9)</td>
</tr>
<tr>
<td>ESL</td>
<td>1,137 (3.4)</td>
<td>8,964 (7.4)</td>
<td>1,122 (10.6)</td>
</tr>
</tbody>
</table>

Chi square tests were performed in order to examine the significance of relationships between variables, specifically looking at the relationship between the latent class grouping variable and certain key variables of interest (Steinberg, 2011). The analyses examined the
following characteristics: 1) Level of study (applied vs. academic) 2) OSSLT performance 3) Gender 4) IEP and 5) ESL.

4.2.1 Level of Study (Applied vs. Academic)

Figure 2 shows the percentage of applied and academic students within each reading engagement group. Both the academic and applied students followed the same distribution, where the majority of students were in the medium engaged group, with a smaller percentage of students in the limited engagement group, and the smallest percentage of students in the highly engaged group. Notably, more applied students (26.4%) than academic students (21%) were found in the low engagement group. The opposite trend was found in both the middle and highly engaged groups, where membership for academic students was higher (medium = 73.4%, high = 5.6%) than applied students (medium = 68.8%, high = 4.8%), indicating lower reading engagement for applied students when compared to academic students. The Chi-square test confirmed the statistically significant yet weak association between level of study (applied vs. academic) and latent classes ($\chi^2 (2) = 288.11, p < .001, \phi = 0.05$).

![Figure 2](image.png)

*Figure 2. Percentage of applied and academic student membership across latent classes.*
4.2.2 OSSLT Performance

Figure 3 illustrates the percentage of students within each latent class who passed and failed the OSSLT for academic students and applied students. The pass/fail percentages within each latent class were relatively consistent across all academic students and across all applied students, however, when comparing between academic and applied students for high, medium and low engagement groups, academic students had a consistently higher percentage of students who passed the OSSLT compared to applied students. Chi-square tests confirmed statistically significant yet weak relationships between OSSLT performance and latent class for applied, $\chi^2 (2) = 14.391, p = .001, \varphi = .026, p = .001$) and academic groups ($\chi^2 (2) = 18.635, p < .001, \varphi = .015$).

![Figure 3. Distribution of OSSLT pass/fail across latent classes for academic and applied students.](image)

4.2.3 Gender

The composition of gender across latent classes is provided in Figure 4. More males (25.2%) than females (19.2%) were in the low engagement group, fewer males (69.4%) than females (75.5%) were in the middle engagement group and the same percentage of males and females (5.4%) were in the high engagement group. The Chi-square tests confirmed statistically
significant relationships between gender and latent classes for both applied ($\chi^2 (2) = 144.74, p < .001, \phi = 0.08$) and academic ($\chi^2 (2) = 317.32, p < .001, \phi = 0.06$) students.

![Percentage of student membership by gender across latent classes](image)

*Figure 4. Percentage of student membership by gender across latent classes.*

### 4.2.4 IEP

Students identified as having an IEP were analyzed across latent classes and by academic and applied achievement grouping (Figure 5). Differences between classes were not pronounced, with relatively consistent percentages of IEPs across high, medium and low classes for both applied and academic groups. Interestingly, applied students in the highest reading engagement group had the highest percentage of students with an IEP ($n = 445$). The differences between having an IEP in applied vs. academic groups, however, was quite apparent, where for academic students, 9.5 – 10.6% of students had IEPs across latent classes, and for applied students, 34.9 – 44.2% of students had IEPs across classes. The Chi-square tests confirmed the statistically significant yet weak relationships for both academic ($\chi^2(2) = 7.172, p = .028, \phi = 0.009, p = .028$) and applied ($\chi^2(2) = 44.60, p < .001, \phi = 0.04$) students.
Figure 5. Percentage of students with IEPs across latent classes within academic and applied levels of study.

4.2.5 ESL

For students in ESL classes, both academic and applied groups demonstrated a similar trend across latent classes, where fewer ESL students were in the lowest engagement reading groups (academic = 0.9%, applied = 0.4%) and the largest percentage of ESL students were in the high engagement reading groups (academic = 2.2%, applied = 2%) as shown in Figure 6. The Chi-square tests confirmed statistically significant yet weak relationships for both academic ($\chi^2(4) = 51.433, p < .001, \phi = 0.03$) and applied ($\chi^2(4) = 29.974, p < .001, \phi = 0.04$) students.
4.3 What are the achievement differences between applied and academic students?

In order to better understand differences in literacy achievement between students in applied vs. academic courses, overall achievement levels on the OSSLT were compared. Additionally, three areas of focus assessed on the reading component of the OSSLT were examined: explicit information and ideas, implicit information and ideas (making inferences) and making connections between information and ideas (EQAO, 2007). In 2013, approximately 78% of students participated in academic level grade ten courses and 22% of students participated in grade ten applied level courses. Despite an overall combined pass rate of 84% for these students, Table 7 illustrates the substantial differences in student performance between the groups. The percentage of students who passed the OSSLT in the academic group was considerably higher (93.7%) than the percentage of students who passed the literacy test within the applied group (51.5%), a group who experienced rates of failure more than double their academic peers.

Average literacy scale scores which range from 200 to 400 (300 being the provincial standard requirement) differed between groups. For academic students, a mean score of 330.78, well above the minimum requirement, was found. In the applied group, however, the mean score did
not meet the provincial standard at 297.52. The standard effect size (Cohen’s $d$) for the literacy scale score was 1.29.

Table 7. *Academic vs. Applied Student Performance on the OSSLT*

<table>
<thead>
<tr>
<th></th>
<th>Academic</th>
<th>Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passed the OSSLT</td>
<td>97,324 (93.7%)</td>
<td>14,884 (51.5%)</td>
</tr>
<tr>
<td>Literacy Scale Score mean</td>
<td>331.15</td>
<td>299.50</td>
</tr>
</tbody>
</table>

4.3.1 Difference in Skill Mastery

Both academic and applied groups were further analyzed in order to look at differences in performance on the three OSSLT sub-skills. As illustrated in Figure 7, academic students performed better across all three sub-skills compared to applied students. Academic student performance was also more consistent across the skills, indicating an overall mastery, where applied students showed wider variation regarding ability within each sub-skill. Interestingly, the order of highest to lowest percentage of student mastery across sub-skills differed for applied and academic students (Figure 7). For academic students, the highest percentage of students mastered implicit understanding (92.7%), then making connections (91.4%) and the lowest percentage of students mastered explicit understanding (90.3%). For applied students, however, the highest percentage of students mastered explicit understanding (66.9%), then making connections (62.8%) and the lowest percentage of students mastered implicit understanding (59.4%).
Figure 7. Academic and Applied students OSSLT sub-skill performance: Explicit, Implicit and Making connections

Table 8 captures frequency and percentages for students who passed the three sub-skills (explicit, implicit, making connections) in the applied and academic achievement groups, as well as sub-skill means and standard deviations for each group. Additionally, Cohen’s effect size value suggested a low to moderate effect size \(d = .35\) for all three sub-skills, indicating a difference between applied and academic student performances for explicit understanding, implicit understanding and making connections where applied students experienced less success passing the sub-skill areas than their academic peers.
Table 8. Descriptive Statistics and Cohen’s d for Academic and Applied Group Sub-Skills

<table>
<thead>
<tr>
<th></th>
<th>Explicit</th>
<th>Implicit</th>
<th>Making Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Applied</td>
<td>Academic</td>
<td>Applied</td>
</tr>
<tr>
<td>Frequency (%) passed</td>
<td>14,473</td>
<td>75140</td>
<td>12854 (66.9)</td>
</tr>
<tr>
<td>sub-skill</td>
<td>75140</td>
<td>12854</td>
<td>77213 (59.4)</td>
</tr>
<tr>
<td>$M$</td>
<td>.67</td>
<td>.90</td>
<td>.59</td>
</tr>
<tr>
<td>$SD$</td>
<td>.47</td>
<td>.30</td>
<td>.49</td>
</tr>
<tr>
<td>Cohen’s $d$</td>
<td>.35</td>
<td></td>
<td>.35</td>
</tr>
</tbody>
</table>

4.4 What early indicators effectively predict secondary-school students’ future enrollment in applied and academic level achievement courses?

By using OSSLT test data tracking the cohort students from grade three to grade ten, multiple regression analyses were performed in order to determine if later student experiences could be predicted based on earlier test performance. A hierarchical logistic regression was performed in order to predict future enrollment in academic vs. applied classes based on demographic information (gender, ESL and IEP) as well as reading engagement latent class (high, medium, low). A second analysis was performed in order to predict future enrollment in academic vs. applied achievement groups based on grade three test performance.

4.4.1 Predicting Academic vs. Applied membership from Demographic Information.

A logistic regression was performed with gender, IEP and ESL entered in the first step and LCA reading engagement categories entered in the second step in order to predict level of study (applied vs. academic). As indicated in Table 9, the model was statistically significantly different from the null model, $\chi^2(3) = 9876.337$, $p < .001$ with Nagelkerke $R^2 = .15$. The model correctly
classified 80% of cases. Both gender and IEP were statistically significant predictors, indicating that male students were 1.8 times as likely to be in applied English and students with an IEP were .19 times more likely of being in applied English. ESL was not statistically significant, however, reading engagement was statistically significant, indicating low engaged readers were 1.5 times more likely to be in applied English.

Table 9. Results of Logistic Regression Analysis: ESL, IEP and Reading Engagement

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p</th>
<th>Odds Ratio</th>
<th>95% for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.61</td>
<td>.02</td>
<td>1315.26</td>
<td>1</td>
<td>.00</td>
<td>1.84</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESL</td>
<td>-21.56</td>
<td>32601.28</td>
<td>.000</td>
<td>1</td>
<td>.99</td>
<td>.00</td>
<td>.00</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEP</td>
<td>-1.67</td>
<td>.02</td>
<td>7979.55</td>
<td>1</td>
<td>.00</td>
<td>.19</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latent Class (1)</td>
<td>.41</td>
<td>.04</td>
<td>99.99</td>
<td>1</td>
<td>.00</td>
<td>1.50</td>
<td>1.39</td>
</tr>
<tr>
<td>Latent Class (2)</td>
<td>.13</td>
<td>.04</td>
<td>11.45</td>
<td>.001</td>
<td>1.14</td>
<td>1.06</td>
<td>1.23</td>
</tr>
<tr>
<td>Latent Class (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>21.01</td>
<td>32601.28</td>
<td>.00</td>
<td>1</td>
<td>.99</td>
<td>1.33</td>
<td></td>
</tr>
</tbody>
</table>
4.4.2 Predicting Academic vs. Applied Membership from Grade Three Test Performance.

A binary logistic regression was performed in order to ascertain the effects of grade three test performance on the likelihood that students would later enroll in applied vs. academic courses in grade ten. Applied vs. academic enrollment was entered as the dependent variable and performance (level one to four) on the grade three literacy reading test was entered as the predictor variable with level four (exceeding the provincial standard) as the reference category. As indicated in Table 10, the model was statistically significant $\chi^2(3) = 1357.01, p < .0005$, and explained 19% (Nagelkerke $R^2$) of the variance in course enrollment and correctly classified 80.5% of cases. This indicates that scoring lower on the grade three EQAO test was associated with an increased likelihood of later enrollment in the applied stream, indicating that it is possible to predict future student course enrollment by grade three. Students who scored a level one (below the provincial standard) in grade three were 63 times more likely to be in applied English. Students who scored a level two (approaching the provincial standard) were 24 times more likely to be in applied English. Level three students (met the provincial standard) were 5.61 times as likely to be in applied English.

Table 10. Results of Logistic Regression Analysis: Grade Three Reading Performance

<table>
<thead>
<tr>
<th>Level</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p</th>
<th>Odds Ratio</th>
<th>95% for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Level 1</td>
<td>4.14</td>
<td>.08</td>
<td>2771.45</td>
<td>1</td>
<td>.000</td>
<td>62.91</td>
<td>53.92</td>
</tr>
<tr>
<td>Level 2</td>
<td>3.19</td>
<td>.07</td>
<td>1837.02</td>
<td>1</td>
<td>.000</td>
<td>24.21</td>
<td>20.92</td>
</tr>
<tr>
<td>Level 3</td>
<td>1.72</td>
<td>.07</td>
<td>539.48</td>
<td>1</td>
<td>.000</td>
<td>5.61</td>
<td>4.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper</td>
</tr>
<tr>
<td>Level 4</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-3.67</td>
<td>.07</td>
<td>2513.58</td>
<td>1</td>
<td>.000</td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>
4.5 What is the distribution of possible student trajectories across testing years?

Student reading test performance on the EQAO from grade three, to grade six to the OSSLT in grade ten was tracked in order to develop deeper insight regarding potential student trajectories through the Ontario school system, to better understand contributing factors to student success and failure. Students in applied and academic classes with complete data capturing performance on all three tests \((n = 104,900)\) were selected for further analysis. Within this sample of students, approximately 69.7\% met or exceeded the grade three test, 77.4\% met or exceeded the grade six test and 86.4\% met or exceeded the OSSLT test. Table 11 compares the performance of students in the applied group vs. the academic group across tests. It is evident that applied students experienced less success than academic students on all three tests, with disparities between groups already present in grade three.

<table>
<thead>
<tr>
<th>Frequency (%)</th>
<th>G3</th>
<th>G6</th>
<th>OSSLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>Pass</td>
<td>64,759 (77.8%)</td>
<td>71,660 (86%)</td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>18,492 (22.2%)</td>
<td>11,591 (13.9%)</td>
</tr>
<tr>
<td>Applied</td>
<td>Pass</td>
<td>8,338 (38.5%)</td>
<td>9,549 (44.1%)</td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>13,311 (61.5%)</td>
<td>12,100 (55.9%)</td>
</tr>
</tbody>
</table>

Tracking students longitudinally across grades, three, six, and ten was used as a method to map out the eight student trajectories of potential combinations of passing and failing the three tests (grade three, six and ten), i.e. passing all three (1-1-1), failing all three (0-0-0), and all other possible combinations of passing and failing. These trajectories were compared between applied and academic students, outlined in Table 12 and organized by the highest to lowest frequency of students within each trajectory grouping. The results show that the most common pathways for
students within the applied group are different than in the academic group. The majority of academic students (71.2%) experienced success on all three tests (1-1-1) and the second largest group of academic students (12.6%) experienced success on 2 of the three tests (0-1-1). Within the applied group, however, the largest percentage of students (27.8%) failed all three tests (0-0-0), where within the academic group, only 2.5% fit into this trajectory. Students who passed all three tests (1-1-1), although the second largest group of applied students (20.8%), was more than three times smaller than the academic group (71.2%). These findings are quite striking. It is also notable that the least number of students for both groups fell into trajectories where they started off succeeding and later experienced failure (1-0-0, 1-1-0). That is, students were more likely to have difficulty early on and either continue to have difficulty or experience some success than to have success and later experience failure. These findings have implications for teacher intervention. The different trajectories between groups have also been visually replicated in Figure 8.

Table 12. Comparison of Reading Achievement Levels Across Grades Three, Six, and Ten for the Cohort Students

<table>
<thead>
<tr>
<th>Gr.3-Gr.6-Gr.9*</th>
<th>Applied</th>
<th>Academic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (%)</td>
<td></td>
</tr>
<tr>
<td>0-0-0</td>
<td>6,009 (27.8)</td>
<td>2,104 (2.5)</td>
</tr>
<tr>
<td>1-1-1</td>
<td>4,510 (20.8)</td>
<td>59,272 (71.2)</td>
</tr>
<tr>
<td>0-0-1</td>
<td>3,234 (14.9)</td>
<td>4,956 (6.0)</td>
</tr>
<tr>
<td>0-1-1</td>
<td>2,657 (12.3)</td>
<td>10,469 (12.6)</td>
</tr>
<tr>
<td>1-0-1</td>
<td>1,587 (7.3)</td>
<td>3,915 (4.7)</td>
</tr>
<tr>
<td>0-1-0</td>
<td>1,411 (6.5)</td>
<td>963 (1.2)</td>
</tr>
<tr>
<td>1-0-0</td>
<td>1,270 (5.9)</td>
<td>616 (0.7)</td>
</tr>
</tbody>
</table>
1-1-0       971 (4.5)        956 (1.1)

Total       21,649         83,251

Note. *The number 0 (fail) and 1 (pass) have been used to represent test performance for each grade (e.g. 0-0-1 represents a student who failed grade three and grade six but passed grade ten.

Figure 8. Pass/fail trajectories for students enrolled in academic and applied courses.

4.5.1 Characteristics of Developmental Reading Profiles

Developmental reading achievement profiles for both academic and applied groups were analyzed, looking at the following demographic features: gender, ESL status and presence of an IEP. The results are captured in Table 13 and 14. Finally, student trajectories demonstrating resilience, that is, students who failed one or two tests and then experienced success (0-0-1 and 0-1-1) were further investigated in order to better understand characteristics of this particular subgroup.
Table 13. Background Characteristics of Different Reading Achievement Profiles Among Academic Students

<table>
<thead>
<tr>
<th>Gender (%)</th>
<th>ESL (%)</th>
<th>IEP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>1-1-1</td>
<td>25,717 (43.4)</td>
<td>33,555 (56.6)</td>
</tr>
<tr>
<td>0-1-1</td>
<td>5,467 (52.2)</td>
<td>5,002 (47.8)</td>
</tr>
<tr>
<td>0-0-1</td>
<td>2,663 (53.7)</td>
<td>2,293 (46.3)</td>
</tr>
<tr>
<td>1-0-1</td>
<td>1,916 (48.9)</td>
<td>1,999 (51.1)</td>
</tr>
<tr>
<td>0-0-0</td>
<td>1,160 (55.1)</td>
<td>944 (44.9)</td>
</tr>
<tr>
<td>0-1-0</td>
<td>508 (52.8)</td>
<td>455 (47.2)</td>
</tr>
<tr>
<td>1-1-0</td>
<td>495 (51.8)</td>
<td>461 (48.2)</td>
</tr>
<tr>
<td>1-0-0</td>
<td>321 (52.1)</td>
<td>295 (47.9)</td>
</tr>
</tbody>
</table>

Table 14. Background Characteristics of Different Reading Achievement Profiles Among Applied Students

<table>
<thead>
<tr>
<th>Gender (%)</th>
<th>ESL</th>
<th>IEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-0-0</td>
<td>3,784 (63)</td>
<td>2,225 (37)</td>
</tr>
<tr>
<td>1-1-1</td>
<td>2,821 (62.5)</td>
<td>1,689 (37.5)</td>
</tr>
<tr>
<td>0-0-1</td>
<td>2,007 (62.1)</td>
<td>1,227 (37.9)</td>
</tr>
<tr>
<td>0-1-1</td>
<td>1,712 (64.4)</td>
<td>945 (35.6)</td>
</tr>
</tbody>
</table>
4.5.1.1 Gender

Males and females within both the academic group and applied group were homogenous in terms of the order of trajectory membership when looking at frequencies. That is, across both genders in the academic group, the highest number of students fell into the 1-1-1 (passing all three tests) trajectory and were least likely to fall into the 1-0-0 (passing grade three, and failing grade six and ten) category, whereas in the applied group, both males and females were most likely to fall into the 0-0-0 (failing all three tests) trajectory and least likely to fit into 1-1-0 (passing grade three and grade six and failing the OSSLT) (see Figure 9 and 10).

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-0-1</td>
<td>996 (62.8)</td>
<td>591 (37.2)</td>
</tr>
<tr>
<td>0-1-0</td>
<td>958 (67.9)</td>
<td>453 (32.1)</td>
</tr>
<tr>
<td>1-0-0</td>
<td>825 (65)</td>
<td>445 (35)</td>
</tr>
<tr>
<td>1-1-0</td>
<td>664 (68.4)</td>
<td>307 (31.6)</td>
</tr>
</tbody>
</table>

*Figure 9. Gender difference in developmental reading profiles among applied students*
4.5.1.2 IEP

Students with IEPs were enrolled in both the academic and applied courses. However, there are quite striking differences when student performance was examined between groups. For academic students, 81.1% \((n = 6714)\) experienced success on two or more of the three provincial tests. However, only 31% \((n = 2521)\) of applied students were successful on two or more of the tests. Additionally, only 4.7% \((n = 467)\) of academic students with an IEP failed all three tests, whereas 38.4% \((n = 3172)\) of applied students failed all tests (see Figure 11).

*Figure 10. Gender difference in developmental reading profiles among academic students*

*Figure 11. Percentage of applied and academic students within each trajectory with an IEP*
4.5.1.3 ESL

Students identified as ESL across both groups shared the common feature of being least likely to pass the grade three and six tests and then fail the OSSLT (1-1-0). Success on two or more tests, however, was three times more likely in the academic group (76.6%, $n = 862$) than in the applied group (25%, $n = 39$). For academic students, 6.2% ($n = 530$) failed all three tests, whereas 40.4% ($n = 63$) of applied ESL students failed all three tests (Figure 12).

Figure 12. Percentage of applied and academic students within each trajectory in ESL.
5 Discussion

This study aimed to investigate literacy within the Ontario context, exploring potential contributing factors to student reading performance including demographics, home reading behaviour, achievement differences between students within the current applied – academic grouping structure, taking a longitudinal analytical approach examining students’ trajectories across school testing years. The majority of the results were organized around student membership to applied and academic English courses, as this proved to be a highly influential factor in determining student performance outcomes. This chapter discusses the findings, focusing on how they provide a better understanding of the key issues faced by Ontario secondary school students and illuminating potential areas for improvement and further analysis within the current system.

5.1 What are the demographic differences between grade ten students enrolled in applied vs. academic achievement level English courses?

A statistically significant association between ESL status and the level of study was found, however, these findings contradicted previous reports suggesting that applied groups had a higher number of immigrants and ELLs, instead indicating a higher number of ESL students within the academic group (People for Education, 2013). It is important to note, however, that the categorization of students as ESL used for the analysis specifies students who participate in ESL courses, but is a limited definition and does not necessarily capture the entirety of the ELL population, i.e. those not enrolled in ESL courses. Additionally, these findings support the literature which points to cultural explanations regarding immigrant student performance, where despite lower performance in reading on standardized tests, immigrant students were 1.5 times more likely to attend university than Canadian born students, had higher educational aspirations than Canadian born students, had parents with higher aspirations and expectations compared to Canadian born parents and in certain cases, outperformed their Canadian-born peers (Thiessen, 2007). Considering this literature, it is not surprising that a higher number of ESL students would be enrolled in the academic stream, geared more towards higher-level academic thinking and a focus on preparation for further education.
Although controversy persists regarding the relative impact of gender differences on achievement, the current study supports previous research showing a gender difference in literacy, where females outperform males (Ardila et al., 2011; Gambell & Hunter, 2000; OECD, 2014). Within Ontario, statistically significant differences between gender makeup of applied and academic groups are apparent, with a higher percentage of female students in the higher performing academic stream and a higher percentage of male students in the lower performing applied stream. It is likely that biology alone is not responsible for such differences, but instead, cumulative factors related to socialization and educational context, which act to further entrench any potential prevailing differences as students progress through the education system to secondary school. As Powney states, “rather than a single factor, it is the cumulative disadvantage accrued from a complex interaction of social and educational factors which affects a pupil’s uptake and success in educational opportunities” (1996, p.63)

Results regarding IEP status were not surprising. A significantly higher percentage of applied students - over four times the number of academic students - were identified as having exceptionalities. That is, significantly more students with exceptionalities were found in the lower performing applied stream on the OSSLT.

5.2 What are the differences in home reading behaviours between applied and academic students?

The LCA revealed three distinct classes of readers based on how often they engaged with a variety of text types: high engagement readers, medium engagement readers and low engagement readers. The analysis indicated that the majority of students fit within the medium range (73%), with fewer students demonstrating low levels of engagement (20%), and the smallest number of students showing high levels of engagement (6%). These findings support that literature which suggests that the majority of Ontario adolescents are in fact relatively active readers, engaging in some reading behaviour most weeks. The findings also support the importance of considering a broader range of texts when discussing student reading behaviour (Hopper, 2005; Moje et al., 2008).
In regards to what students were reading, the most highly engaged readers demonstrated less variability across text types, but an overall interest across all reading material, with the exception being somewhat less interest in religious texts and comics. The medium and low engagement groups demonstrated a higher level of variability across reading types, suggesting the potential importance for teachers to be mindful of incorporating student choice and fostering situational interest in order to motivate students when exposed to less preferred texts. Much literature discusses the potential benefits of providing students with choice within the classroom (Casey, 2008; Lelters, 2006; Williams, Wallace, & Sung, 2015). Additionally, in her work on interest and reading, Hidi (2001) proposed the term situational interest to refer to “environmentally-triggered interest of which text-based interest should be considered as one subtype” (p.193). Touting the critical importance of student interest in motivation and learning, Hidi advocates that generating situational interest is one method through which teachers can motivate students and facilitate participation in reading for those less interested in a particular text type or content area (Hidi, 2001).

For medium and low engagement groups, both followed similar patterns, indicating the most interest in reading magazines, novels, and poetry, and less interest in reading religious texts and letters. This was in keeping with Moje et al.’s analysis (2008) suggesting magazines and novels to be among the top six most popular reading materials, however, differed regarding poetry, which Moje et al. found to be less popular. Additionally, although both studies share similar findings regarding the lack of popularity of religious texts, letters were the second most popular reading type within Moje et al.’s study (2008), differing substantially from the current study findings which indicated that students were less inclined to read letters. It is possible that this has to do with students understanding of what a letter is, where in Moje et al.’s (2008) study the item was listed as “letters/notes” perhaps bringing to mind a less formal connotation of letter, one more inclusive of casual exchanges among peers, whereas in the current study, letters were interpreted as something received in the mail, likely a less popular or common reading material.

Looking more closely at membership across the high, medium and low groups (Figure 2), although the majority of students across both groups were in the medium engagement group, both applied and academic students displayed the same pattern, with more students in the low engagement group than high engagement group. However, a higher percentage of applied than academic students were in the low engagement group and a higher percentage of academic
students than applied students were in the high engagement group, although the percentage of students in the highest engagement group were fairly similar (5.6% academic students and 4.8% applied). This suggests that although reading may have some impact on academic performance as suggested by the literature (Clark & Akerman, 2006; Guthrie & Wigfield, 2000; Sullivan & Brown, 2013), it does not necessarily mediate academic performance. If this were the case, you would expect to see a significantly higher percentage of academic students in the most highly engaged reading group and fewer academic students within the lowest engaged reading group. Additionally, pass/fail rates on the OSSLT were not related to level of reading engagement, with relatively consistent rates across the three groups, representative of the pass/fail rates found in the academic/applied performance divide. This again suggests that simply being a more highly engaged reader, as defined by the student questionnaire, did not contribute to higher academic performance in English and that text types read at home did not distinguish achievement levels.

Unsurprisingly and in line with the literature suggesting females read for pleasure more than males (Moje et al., 2008), more males were in the lowest reading engagement group than females, and more females were in the medium engagement group than males. However, of note was the distribution of males and females in the most highly engaged group, where the percentages were equivalent. This supports the literature, which suggests a more significant gender divide is evident among lower level learners than higher level learners, where this divide disappears (OECD, 2014; Ostrosky et al., 1985).

The percentage of students across groups having an IEP was relatively consistent, suggesting that reading engagement did not appear to interact with having an exceptionality.

Both academic and applied ESL students demonstrated the same trend across reading engagement groups, where fewer students were in the low engagement group and the majority of students were in the highest engagement group. This finding suggests that students in ESL classes, regardless of enrollment in applied or academic streams, are typically more highly engaged English readers, again in line with Thiessen’s (2007) work suggesting cultural factors impacting student work ethic, aspirations, and achievement are associated with more highly engaged readers. It is also possible that ESL students read more English texts because they require more time outside of school practising their second language.
5.3 What are the achievement differences between applied and academic students?

In regards to achievement, academic students had a pass rate of almost two times that of applied students. Literacy scale scores also reflected the achievement differences between groups, where academic students were above the provincial standard and applied students barely met the standard. These findings, which indicate differential performance on the OSSLT between groups, support the substantial body of literature which suggests that grouping of students is not necessarily beneficial to student academic outcomes (Maaz et al., 2008; Tach & Farkas, 2006; Trautwein et al., 2006). As shown in the longitudinal tracking analysis, the applied track draws students who have been struggling academically since grade three. Streaming may therefore exacerbate the academic achievement gaps rather than close them.

As discussed, for a variety of reasons the effects of ability grouping have been found to have substantial negative impact on students, most significantly when administered earlier in a student’s trajectory (Hanushek & Wößmann, 2005; Tach & Farkas, 2006), however, this study suggests that the negative effects of such stratification can also be found in education systems where grouping structures are administered later, at the secondary school level.

An analysis of sub-skills assessed on the OSSLT (explicit understanding, implicit understanding, and making connections) suggested differences between applied and academic groups in regards to order of sub-skill mastery. Overall, academic students performed well across groups, however, performed best on implicit understanding, and worst on explicit understanding. More variability was found in sub-skill mastery among applied students, as well as a difference in mastery order, where these students performed best on explicit understanding and worst on implicit understanding. These findings contradict those by Jang et al. (2013) who found that students in grade six mastered implicit understanding first and found making connections to be most difficult. This finding perhaps indicates that with the introduction of increasingly complex text materials as students progress to the secondary level, implicit text understanding becomes much more challenging. Additionally, it is possible that with repeated exposure to reading comprehension tasks across school years, struggling readers may develop the necessary “look back” strategies required to answer explicit comprehension questions, discussed by Israel and Duffy (2014) as lacking in poorer comprehenders.
5.4 What early indicators effectively predict secondary-school students’ future enrollment in applied and academic level achievement courses?

The regression analysis performed indicated that gender, IEP and reading behaviour accounted for 14.5% of the unique variance in future course enrolment. Specifically, the most substantial predictive factors for enrolment in applied courses were being male or membership within the lowest reading engagement group. Less substantial but still significant was having an IEP. The second prediction model suggests that we can predict future enrolment in applied vs. academic courses, explaining 19% of the variance, based on grade three EQAO test performance, where the lowest performers (level one) are most likely to be in applied English, and the likelihood of future enrolment in applied English decreases across levels. Building on discussions regarding the significant impact of contextual factors both within and outside of school, these findings help pinpoint some specific areas to target by highlighting who of the most vulnerable students are in need of early intervention and teacher support.

5.5 What is the distribution of possible student trajectories across testing years?

When comparing applied and academic student trajectories across years, it is apparent that differences exist between groups as early as grade three, where twice as many students in the academic group passed the EQAO than the applied group. Both academic and applied students demonstrate a similar pattern of increasing success on provincial testing from grade three to OSSLT, however, the academic group increased by about 16%, where applied students showed increases of only 6.1% across testing years.

When comparing student trajectories between groups, the majority of academic students passed all three tests (1-1-1), with the next most common trajectory being failing grade three and passing grade six and OSSLT (0-1-1), followed by a remainder of only 16.2% of students fitting into the other categories. In the applied group, however, over a quarter of students failed all three tests (0-0-0), and there was much more variance regarding the percentage of students in other potential trajectories, suggesting that the academic students represent a more homogenous
response to testing than their applied peers. This likely reflects the variability within this group in regards to the nature of student struggle, as applied students experience a complex variety of challenges.

For both groups, students were least likely to experience success followed by failure (1-0-0, 1-1-0), that is, it is more common for students to demonstrate trajectories of improvement where failure is followed by success (0-0-1, 0-1-1). Also less likely for both groups were variable trajectories demonstrating alternation in passing and failing (0-1-0, 1-0-1). These findings support the literature suggesting the benefits of paying attention to early indicators of failure. Grade three EQAO performance is one such indicator. This is especially important because it is possible for students to show trajectories of improvement, whereas it is less likely that those passing the grade three EQAO will experience subsequent failure. Other psychosocial factors such as differential treatment and/or student motivation may influence this finding, for example, higher teacher and parent expectations and stronger feelings of student self-efficacy may result from success on the first test, positively impacting student trajectories compared to those students who did not experience such success. It is therefore important to consider broader psycho-social factors in order to mitigate such influences.

The analysis also provides insight regarding not only who struggling readers are, but also, who resilient readers are. Jang (2014) stresses the importance of gathering “information about both the strengths and areas needing improvement in specific components of language ability, in order to tailor instruction to their learning needs while capitalizing on their strengths” (p. 25). Students who initially failed the grade three test before passing (0-1-1) or who failed both the grade three and six tests but passed the OSSLT (0-0-1) have particularly unique trajectories, as these students demonstrated resilience within the education system after initially experiencing failure. For both applied and academic groups, these students were more likely to be males (applied males: \( n = 3719 \), academic males \( n = 8130 \)) than females (applied females: \( n = 2172 \), academic females \( n = 7295 \)). No differences were found within these groups regarding IEP and ESL status. When analyzing the trajectories by gender, females again demonstrated higher success than males, where more females passed all three tests (1-1-1) and more males failed all three tests (0-0-0) within the academic group, however, it is interesting to note that within the applied group, more males failed all three tests, yet a much higher percentage of male students
than female students passed all three tests. This finding perhaps suggests that differences in
gender are related to performance level.

Academic and applied students with IEPs followed almost identical patterns of
membership within the various trajectories. It is interesting to note, however, that the largest
percentage of students within both groups belonged to the trajectory where students fail all three
tests (0-0-0) and the smallest percentage of students within both groups passed all three tests (1-
1-1), indicating the inherent academic difficulties faced by students with IEPs regardless of level
of study. Finally, the second most common trajectory for both academic and applied students
with IEPs was failing the grade three and six tests but passing the OSSLT (0-0-1). This indicates
a longer trajectory towards success, and potentially reflects the length of time it takes for
students to be identified and provided with an IEP and necessary supports required to succeed.

In regards to students attending ESL classes, the findings were quite interesting.
Substantial differences in trajectories were found between ESL students within the applied and
academic groups. Within the academic group, the most common trajectories were failing all
three tests (0-0-0), and failing 2 tests but passing the OSSLT (0-0-1). These findings were in
contrast to the broader academic student trajectories, where the most common trajectory was
passing all three tests (1-1-1). Within the applied ESL group, the two trajectories of failing all
three (0-0-0) and two of three tests (0-0-1) were also the most common, however, were more in
alignment with other applied students’ trajectories. Within the academic ESL group, it is also
interesting to note that among the top three most common trajectories, two of these included
resilience trajectories. Within the applied group, a high number of students fit into the more
long-term trajectory of resilience, failing two tests before passing the OSSLT (0-0-1). For both
groups, it was much less common to pass all three tests. These findings support discussions
regarding ESL heterogeneity. Additionally, these findings may capture the challenges that
students who are less familiar with English experience while taking high stakes tests, raising
questions regarding fairness and validity as ESL students within the academic group have very
different test taking trajectories than their non-ESL peers.
5.6 Limitations

A number of limitations in study design and methodology should be noted. Firstly, all data analyzed and subsequent conclusions drawn were based on secondary provincial testing data. Findings are therefore based on a single measure of reading ability. Although standardized tests are an efficient means for promoting accountability and identifying and tracking student and school performance, many researchers have discussed the inherent limitations imposed by such testing, including: focus on outcomes over process, privileging multiple-choice test-taking behaviour over other behaviours, focusing on lower-order learning objectives, results being more representative of socioeconomic status than student knowledge/ability, impact of unwanted teaching effects, reliability of information regarding student achievement, lack of diagnostic information, and issues of construct and content validity (Linn, 2000; Ontario Secondary School Teachers Federation, 2001; Stufflebeam, 2001). Additionally, data was utilized from the student questionnaire component of the OSSLT. This data is self-report data and the accuracy of the background information provided has not been verified.

Despite the above concerns, the EQAO (2015c) states, “EQAO has established quality-assurance procedures to help ensure that its assessments are administered consistently and fairly across the province and that the data produced are valid and reliable” (p. 36). These procedures include quality assurance monitors who visit schools to maintain test integrity, examination and follow up of test materials for irregularities and database analyses investigating curious student responses as well as overall school patterns/changes in success rates. Additionally, efforts to strengthen the comparability of the OSSLT test have been made through field testing of items used to equate test difficulty from year to year and the use of a blueprint, ensuring test characteristics remain the same from year to year (EQAO, 2007). Follow-up work examining student reading in Ontario would benefit from a more diverse data set, incorporating multiple measures of student reading performance.

A second limitation for consideration is the use of ESL as a grouping mechanism to understand demographic factors related to cultural background and ELLs. The ESL designation does not capture the extent of all ELLs, limiting the analysis to only those who are enrolled in an ESL class, and thus painting too simplistic a picture. People for Education note that only 69% of secondary schools have formal identification processes in place for ELLs (People for Education,
McGloin (2011) notes that enrollment in ESL programs “encompasses a wide and poorly defined range of program options - from minor accommodations made by a teacher in a regular classroom to half-day targeted support from a specialist teacher in a segregated classroom” (p.27). In discussing the heterogeneity of ELLs, Jang et al. (2013) state,

This diversity presents a challenge to typical research approaches in which ELLs tend to be treated as a uniform group with homogenous patterns of language development. Typical dichotomous comparisons of ELLs versus monolingual English-speaking peers in academic and literacy achievements fail to capture the complexity of ELLs’ linguistic and cultural diversity in the Canadian context (p.402).

The current study findings regarding ESL students must therefore be interpreted with caution as they may not accurately reflect the entirety of the ELL population. A more sophisticated, fine-grained analysis is necessary in order to further elucidate trends found within the current study.

Similarly, the use of IEP status to categorize students with exceptionalities would also benefit from a more fine-grained analysis. The IEP designation includes five categories of student types, representing a wide variety of exceptionalities and levels of severity, therefore, follow-up work should include performing a more detailed analysis, examining students by exceptionality type in order to further interpret findings.

As discussed, the study would benefit from the inclusion of a measurement of SES, as this factor has been studied extensively and found to have significant impact on student outcomes, however, this information is lacking from the EQAO and OSSLT data sets. Low SES students have been found to hold more negative attitudes towards learning, rate themselves as less confident readers, and derive less enjoyment from reading than their high SES peers (Clark & Akerman, 2006). Further work which includes a measure of SES is necessary in order to understand the impact of such factors on students within the Ontario context.

Data from the student questionnaire was used to analyze student reading engagement behaviour. This data exhibits certain limitations, where students were asked to indicate (yes/no) whether or not they read specific types of materials in English outside of school most weeks. This question is somewhat vague and open to interpretation, however, provides a rough picture of student reading behaviour, providing a measure of relative student engagement with texts.
Further analyses would benefit from including more detailed measures of time spent reading per week, as well as include a broader selection of 21st century forms of text types, as discussed in Moje et al. (2008) and Hopper’s (2005) studies, for example, replacing the item “reading the internet” with a more diverse range of items such as reading blogs, online articles, emails etc. in order to better reflect changing student reading behaviours. These factors may have influenced the findings in the current study, which tended to show a less significant impact related to reading behaviour.

Finally, students selected for the longitudinal analysis component of the study were those with complete data sets across all three testing years. This method of data selection may have influenced the representativeness of the sample, where those excluded might, for example, be a higher number of ELL students who arrived in Canada after grade three, therefore, impacting findings.

### 5.7 Implications and Recommendations

Despite a lengthy history of research and deliberation, achievement grouping continues to be a hotly debated topic in the present day. Some authors suggest that comparing student performance between different achievement groups is akin to comparing apples to oranges (Condron, 2008; Hong et al., 2012), that is, comparing lower achieving students to higher achieving students, will inevitably reveal disparities in performance outcomes due to the inherent differences between these groups, where students represent different ability levels. However, this view is a gross oversimplification of an issue that has a great number of complexities. Noble et al. (2007) found that “SES explained over 30% of the variance in language, and a smaller but highly significant portion of the variance in most other systems” in their study investigating the relationship between SES and neurocognitive abilities in first-graders (p. 464). In Hyde’s (2005) meta-analysis investigating gender differences, she discussed the “importance of context in creating, erasing, or even reversing psychological gender differences” (p.588). These examples highlight that “rather than a single factor, it is the cumulative disadvantage accrued from a complex interaction of social and educational factors which affects a pupil’s uptake and success in educational opportunities” (Powney, 1996, p. 63). It is evident that student ability alone is not the singular factor at play in determining student outcome, but one that must be considered within a
broader contextual framework which includes factors such as social-psychological factors, gender and ethnicity, school related factors (quality of instruction, test validity, administration), and external influences (peer interactions, parent expectations, SES).

Within Ontario, four goals for education have been declared in the renewed Ministry of Education vision: achieving excellence, ensuring equity, promoting well-being and enhancing public confidence (MOE, 2014a). Under the goal of ensuring equity, it states, “The fundamental principle driving this work is that every student has the opportunity to succeed, regardless of ancestry, culture, ethnicity, gender, gender identity, language, physical and intellectual ability, race, religion, sex, sexual orientation, socioeconomic status or other factors” (MOE, 2014a, p. 8). The current secondary school structure, however, does not fulfill these promises. By grouping students by achievement level into academic and applied cohorts, a significant divide is apparent in student performance and outcomes regarding reading. We must therefore ask ourselves if student grouping is an effective practice in Ontario.

The main goal of the current study was to bring some further clarity to the issue of reading at the secondary school level, particularly with respect to students experiencing difficulty, in order to better understand who these students are and point to future directions for support. Study findings suggest a need to better understand the diversity of ELL students in order to tailor supports for those in need, while encouraging the majority of this group who are actively engaged in reading and participating in academic English. Differences found in performance related to gender indicate a need to better understand the contextual factors within the school system which likely contribute to gender disparities. Hyde (2005) states,

Gender researchers have emphasized the importance of context in creating, erasing, or even reversing psychological gender differences (Bussey & Bandura, 1999; Deaux & Major, 1987; Eagly & Wood, 1999). Context may exert influence at numerous levels, including the written instructions given for an exam, dyadic interactions between participants or between a participant and an experimenter, or the sociocultural level (p. 588).

Gender differences found in the Ontario context suggest the need to consider what specific systemic and environmental factors might influence reading. Some avenues to explore as
suggested by Powney (1996) include, test bias, assessment modes, attitudes towards academic activities, expectations, socialization and reading materials.

Further work is also required in order to break down the broad category of IEP and improve our understanding of the types of exceptionalities represented within applied and academic groups in order to better target supports towards student needs. In regards to reading behaviour, operating within the confines of the limited information provided from the student questionnaire data, the analysis did not indicate substantial findings regarding the relationship between reading outside of school and academic performance. Findings did suggest, however, that Ontario adolescent students are engaging in regular reading activity. Additionally, the results indicate that compared to highly engaged readers, less engaged readers demonstrating more variability in reading behaviour may require additional supports to facilitate their interests, for example, through the provision of choice or manipulation of situational interest. It is also important to continue to broaden our notion of what reading is towards a more inclusive view of text types that encompasses current 21st century student notions of reading behaviour. Finally, more substantial gender differences were noted in regards to reading behaviour within the lowest engaged group, suggesting the need to specifically target male readers demonstrating low reading engagement. This is especially worthy as Mol and Bus (2011) note that “poor readers basic reading skills profit most from reading books in their leisure time” (p. 289).

As discussed, the current system of grouping students does not reflect the Ministry’s mandate of “ensuring that no child or youth will have anything in the way to stop them from reaching their potential” (MOE, 2014a, p.8). Findings from this study reiterate those of Hanushek and Wößmann, (2005) who stated, “in no case do some students gain at the expense of others; both high and low achievers lose” (p. C74). Evidently, there is a need to revisit the current structure of secondary school grouping in Ontario in order to benefit all students.

The longitudinal component of the study has several implications regarding the need for targeted early intervention. In Reynolds (2005) work on early childhood intervention (ECI), he reviewed the benefits attributed to well implemented programs targeting child development, including outcomes related to areas of cognitive development, early school achievement, and educational attainment. For ECI to be successful, timing (starting earlier), duration (multiple year-long programs), comprehensiveness, quality and intensity were all important factors.
Additionally, Cain and Oakhill (2009) have shown that students who have weak reading comprehension skills who receive training benefit more than students who are good comprehenders. Taken together, there is great potential to positively impact the trajectories of struggling readers through targeted early intervention measures. Grade three performance on the EQAO should be used as an early indicator, guiding teacher intervention, especially for those students who are at higher risk, for example, male students, students with IEPs and those less engaged in reading. This is imperative as we know that a significant number of students who fail the EQAO in grade three go on to fail all three tests. Teachers need to support a trajectory of resilience and improvement for those students who experience initial difficulty. We know that there is a relationship between grade three performance and future enrollment within the lower performing applied group, suggesting that students receiving scores of level one and two on the OSSLT in grade three should be of primary focus. The goal should be to provide supports to students to create increased mobility regarding academic trajectories, vs. effectively determining academic futures within elementary school.

Equality in education is paramount to the public education system, and within a system mandated to provide differentiated instruction to support all learner needs, differentiated instruction should not equal differentiated outcomes and rates of success. Roland et al. (2001) describe the benefits of a “prevention-oriented system” where assessment is used to: 1) intervene early and strategically during critical windows of reading development; 2) develop and promote a comprehensive system of instruction based on a research-based core curriculum and enhancement programs; 3) use and rely on formative, dynamic indicators of student performance to identify need, allocate resources, and design and modify instruction; and 4) address reading failure and reading success from a school-wide, systemic perspective” (p. 260). The findings within this study suggest that such a targeted early intervention approach to reading, combined with the modification of the current student grouping structure would better support provincial education mandates, and has the potential to benefit secondary students in Ontario greatly.
References


Johnson, R. S. (2002). *Using data to close the achievement gap: How to measure equity in our schools*. Corwin Press.


Appendix A

**OSSLT Student Questionnaire**

1. A) Is English the first language you learned at home?
   B) What languages do you speak at home?
      a. Only or mostly English
      b. Another langue (or languages) as often as English
      c. Only or mostly another language (or other languages)

2. Indicate how often you use a computer at home for homework.
   a. I don’t have a computer at home
   b. I never or hardly ever use the computer for homework
   c. I use the computer once or twice a week for homework
   d. I use the computer almost every day for homework

3. Indicate the types of materials you read in English outside of school most weeks.
   a. Non-fiction books, e.g. biographies
   b. Comics
   c. Websites, email, chat messages
   d. Letters
   e. Magazines
   f. Manuals, instructions
   g. Newspapers
   h. Novels, fiction, short stories
   i. Song lyrics, poetry
   j. Religious or spiritual writings

4. Indicate the number of hours a week you read materials written in English outside school, not including your homework.
   a. 1 hour or less
   b. more than 1 hour but less than 3 hours
   c. more than 3 hours but less than 5 hours
   d. 5 hours or more
5. Indicate what English language materials you have at home
   a. Dictionaries, encyclopedias (print or electronic)
   b. Books
   c. Newspapers
   d. Magazines

6. Indicate the types of writing you do in English outside of school most weeks
   a. Email, chat messages
   b. Letters, journals, diaries
   c. Notes, directions, instructions,
   d. Song lyrics, poems
   e. Stories, fiction
   f. Work-related writing

7. Indicate the number of hours a week you write in English outside school, not including your homework.
   a. 1 hour or less
   b. more than 1 hour but less than 3 hours
   c. more than 3 hours but less that 5 hours
   d. 5 hours or more