Perceived Professional Roles, Moral Communities, Moral Inclusiveness, and Dentists’ Treatment Decisions

by

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A thesis submitted in conformity with the requirements for the degree of Master of Science in Dentistry

Faculty of Dentistry
University of Toronto

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Abstract

This thesis examined the relationships between perceived professional role (PPR), moral inclusiveness (MI), and treatment intensity. A 46-item survey was used to measure dentists’ demographic and professional factors. PPR was measured by visual analog scale and by Likert-type scale questions. MI was measured by Likert-type scale questions. Treatment intensity was measured by case scenarios. Univariate, bivariate and multivariable analyses were performed. Dentists identifying as business people had greater odds of having a high treatment intensity. Dentists with high MI had lesser odds of having a high treatment intensity. Dentists identifying as health care professionals had greater odds of having high MI. These findings have implications for public trust and dentistry’s status as a health care profession.
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1 Introduction

As health care professionals, dentists are expected to act altruistically, placing their patients’ interests over their self-interest. But over the last few decades, leaders in dentistry and the public have expressed concern that dentists are losing their professionalism, increasingly adopting an approach to care which is rooted in business considerations rather than their patients’ health and well-being (Boyd, Roth, Ralls, & Chambers, 2008; Holden, 2018a; Reid, Humeniuk, Henriksen Hellyer, Thorsteinsdottir, & Tilburt, 2014). There is the fear that a business orientation may be leading, in some cases, to unnecessary dental care, to provision of substandard care, or to lack of comprehensive treatment (Boyd et al., 2008). Studies have suggested that when clinicians are remunerated by the number of procedures rendered, and when they are subject to a market environment, this may promote treatment aggressiveness, and/or an emphasis on profitable procedures (Grembowski, Fiset, Milgrom, Forrester, & Spadafora, 1997; Naegele, Cunha-Cruz, & Nadanovsky, 2010; Öcek & Vatansever, 2014). At the same time, a business ethos may promote the exclusion of “non-profitable” patients, such as those who use public insurance, which has lower levels of remuneration compared to private insurance (Quiñonez, Figueiredo, & Locker, 2009).

However, the literature has suggested that professional codes and norms may mitigate the effect of financial incentives on treatment decisions (Andersen, 2009). Also, we may hypothesize that dentists who place high priority on patient considerations in treatment decisions will take a more conservative treatment approach. For example, Grembowski et al. (1990) found that dentists who had a strong belief in the importance of giving information to patients had a significantly lower diagnostic rate compared to those who did not have such a belief (Grembowski, Milgrom, & Fiset, 1990). In contrast, dentists who are not connected with their
patients, characteristic of a business-oriented approach to care, may fail to recognize their patients’ concerns or needs (Rule, 2010; Rule & Welie, 2009; Welie & Rule, 2006).

Few studies have looked at the treatment decisions of dentists in a Canadian context, much less the interplay of professional values and financial considerations on treatment decisions, and dentists’ connectedness with patients and care rendered. As for the study of connectedness with patients, we may look to the sociology and social psychology literature, which has studied how people’s notions of fairness and connectedness with other groups bring about concern for their well-being (Crimston, Bain, Hornsey, & Bastian, 2016; Opotow, 1990; Schwartz, 2007). In this regard, the following concepts will be used in this thesis: moral inclusion, moral community, and moral inclusiveness. Moral inclusion is the positive application of moral values, rules and considerations of fairness towards others (Opotow, 1990). Our moral community is simply described as those whose well-being concerns us (Regan, 1983). Specifically, it is the group(s) of people we apply moral inclusion towards (Opotow, 1990). Moral inclusiveness describes the breadth of one’s moral community or extent of concern for others (Schwartz, 2007). As professional codes of ethics have included the values of altruism and fairness (Canadian Dental Association [CDA], 2018), principles which represent moral inclusion, it is appropriate to draw on the above literature to study how dentists’ views on these principles may influence treatment decisions.
1.1 Objectives

This thesis’ objectives will be to investigate the relationships between: (a) perceived professional role, defined as a dentist’s belief that s/he is a health care professional versus a business person; (b) moral inclusiveness, defined as the breadth of a dentist’s moral community, or the extent of people that s/he applies moral values, rules and considerations of fairness towards; and (c) treatment intensity, defined as the aggressiveness of a dentist’s treatment decisions.

1.2 Thesis Structure

This thesis will be structured as follows. It begins by presenting a review of the literature on dentists’ professional roles, moral inclusiveness, and current market pressures. It then provides a brief discussion of the study’s methodology, followed by three articles to be submitted to journals. The first two articles examine dentists’ beliefs about their professional roles, their connectedness with patient groups, and their relationship to treatment decisions. The third investigates the relationship between perceived professional roles and moral inclusiveness. Finally, the thesis ends with a general discussion, the implications of the work, some strengths and limitations, and potential future directions for this line of research.
2 Literature Review

2.1 Perceived Professional Roles

It has been argued that once individuals assume a professional role, professional values will substantially guide their conduct in the occupational environment (Moyo, Goodyear-Smith, Weller, Robb, & Shulruf, 2016). But in addition to their roles as health care professionals, dentists must act as business people. From a normative perspective, health care professionals are those who act in their patients’ best interest and for public good, and business people are those who act in their own interest and exclusively for financial gain (Welie, 2004a). Thus, individual differences in professional role orientation may be theoretically linked to differences in professional behaviours and clinical outcomes (Swisher, Beckstead, & Bebeau, 2004). As there is a paucity of empirical studies on how dentists’ perceived professional roles may influence treatment decisions, we may first examine the theoretical literature for insight on this relationship.

Ozar’s three models of professionalism (1985) highlight the possible roles that dentists may take in practice and how they may influence treatment decisions. In the commercial model, the dentist acts as a producer, selling products and services to patients, who can be called consumers. The criterion by which the dentist determines what sort of dental treatment to give to the patient is not the patient’s need, but rather what services the patient is willing to pay for and will give the dentist the greatest return for the least cost in time, effort and materials. In contrast, in the guild model, dentists are care givers, having a moral commitment to serve patients’ needs. However, the relationship between the dentist and the patient is one-way; the dentist, as guardian of dental knowledge and skills, determines the treatment for the uninformed patient. Finally, in the interactive model, the dentist also acts as a caregiver. But the relationship between the dentist
and the patient is, in this case, two-way. Health care decisions are made by the dentist and patient together, combining the expertise of the professional with the choice of the patient. Given the above, we would hypothesize that health care professionals would be characterized by the guild or interactive model and business people would be characterized by the commercial model. Further, we could postulate that dentists who follow the commercial model would be motivated by financial incentives to treat more aggressively compared to dentists who follow the other models.

Basing their work on Ozar’s (1985), Bebeau, Born, and Ozar (1993) created and validated the Professional Role Orientation Inventory (PROI), a 40-item survey which categorized dentists into four professional models: commercial, guild, service and agent. The service model is analogous to Ozar’s interactive model. The agent model, which does not appear in Ozar (1985), can be considered an extreme version of the commercial model. The dentist in this case is a “hired gun” who performs whatever procedure the patient requests. Administering the survey to several groups of dental students and dentists, the research team found that most respondents identified with the service and guild models, followed by the commercial model, and then the agent model. The number who identified with the agent model was almost negligible.

Instead of looking at dentists’ roles directly, Harris, Brown, Holt and Perkins (2014) used survey questions to classify dentists by their dominant institutional logics (prevailing systems of value), and then correlated the responses to dentist behaviour. Previously, the research team identified four institutional logics that dominated English general dentist practice: entrepreneurial commercialism (dentists exploiting technical and business opportunities for commercial gain); managerialism (dentists accounting for activity using administrative measurement systems); duty to staff and patients; and public good (Harris & Holt, 2013). They
found a significant relationship between scoring high on the entrepreneurial commercialism questions and engaging in actions that were concerned with business survival of the practice. In the United Kingdom’s predominantly public dental care system, these actions included restricting high-cost treatment, over-representing patients’ diagnoses (as they wanted to meet minimum care targets), and giving different care to publicly and privately insured individuals.

With regards to the influence of perceived professional roles on clinical procedures, the business-oriented dentists in Öcek and Vatansever’s (2014) qualitative study felt that in a market environment, preventive treatments could be ignored and aesthetic and profitable treatments were preferred. Other studies, while not directly investigating perceived professional roles, have compared the treatment needs of patients to the treatment rendered by private dentists, hypothesizing that instances of overtreatment could be attributed to dentists’ self-interest (Grembowski et al., 1997; Naegele et al., 2010). In Grembowski et al.’s (1997) study, participants had an initial oral assessment by calibrated hygienists. The research team then tracked insurance records for the next two years to quantify any treatment rendered by dentists working in private practices. They concluded that there was evidence of overtreatment, as the private dentists performed significantly more procedures than that noted in the initial oral assessment. They also posited that if overtreatment was a random occurrence amongst dentists, then there would be no associations between overtreatment and dentists’ demographic and practice characteristics. But the research team found associations with certain dentist and practice characteristics, such as dentists’ perceived level of busyness and age of the dental practice, and concluded that private dentists’ treatment decisions were, in part, motivated by financial considerations. Naegele et al. (2010) compared the treatment decisions of dentists working in the private and public sector, representing dentists who could and could not be motivated by self-interest, respectively. Study participants had an initial exam and treatment plan
done by a salaried public dentist. The research team then examined insurance records for the study participants who visited a private dentist within six months of the initial exam to quantify any treatment rendered by private dentists. They also concluded that there was evidence of overtreatment, as the private dentists performed significantly more procedures than that noted in the treatment plan by the public dentists. It was argued that the public dentists did not have any motivation to record patients’ conditions inaccurately, as they had no financial incentives and were not the treating dentists.

Andersen’s (2009) study, however, suggests that professional codes and norms can mitigate the effect of economic incentives on private dentists’ behaviour. The author compared the clinical activity of Danish private and public dentists for two preventive measures: sealants and toothbrush instruction. Seeing that private dentists delivered significantly less sealants than public dentists, Andersen hypothesized that it was due to the lack of financial incentives. On the other hand, private and public dentists did not differ significantly in toothbrush instruction, as there was a professional norm dictating that patients must receive such instruction.

2.1.1 Using Identity Theory to Study Perceived Professional Roles

When pondering the question of why people who all identify as dentists act differently in a similar clinical encounter, we may refer to Identity Theory in sociology (Burke & Stets, 2009; Hogg, Terry, & White, 1995). Identity Theory posits that because people have many interactions with others, people have multiple components of self, called identities (or, more specifically, role identities). For example, a person's role identities may include mother, wife, daughter, and doctor. Each role has a defined set of expectations prescribing behaviour that is considered appropriate by others (Hogg et al., 1995). Role identities provide meaning for self, not only because they provide a way to act, but also because they provide a way to distinguish themselves
from complementary or counter-roles. For example, the role of doctor takes on meaning in connection with a person who takes on the role of patient. When others respond appropriately to a person’s role, this confirms and validates a person's status as a role member and reflects positively on self-evaluation.

While people have multiple role identities, the probability that one will impact social behaviour is tied to the notions of identity salience and commitment. Identity salience is the likelihood that the identity will be invoked in diverse situations. Identities positioned higher in the salience hierarchy are tied more closely to behaviour. Identity commitment can be shown by the importance and number of social relationships premised on a particular role identity. The more rooted the relationships are in a role identity, the more important and more salient the identity. Furthermore, the larger the number of people that are connected to a particular role identity, the more salient the identity. Thus, people with the same role identities may behave differently in a given context because of differences in identity salience.

From this, we could hypothetically identify dentists’ perceived professional roles by asking dentists what they consider their counter-roles are. That is, dentists who believe they are health care professionals would consider other dentists as colleagues, while those who believe they are business people would consider other dentists as competitors. With regards to their identity commitment, health care professionals would be expected to have more relationships with other dentists who also consider themselves health care professionals rather than business people. Further, health care professionals would more likely refer patients to their colleagues, while business people would prefer to keep patients in their own practices.

Identity Theory also postulates that psychological distress may arise if feedback from others' behaviour is perceived to be incongruent with one's identity. Identities can have a “dissonance-reduction mechanism” whereby people modify their behaviour to achieve a match
with their internalized identity standards (Hogg et al., 1995). This process, in turn, reduces distress. As such, if a dentist has an incompatible orientation with the patient – for example, the dentist’s main focus is elective cosmetic procedures but the patient only wants basic care – the dentist will attempt to alter the interaction or find another patient who is compatible with his/her professional identity. Eventually, the dentist will likely attract, retain, and build a practice serving a type of patient that is compatible to his/her style (Maryniuk, 1990; Walsh & Gordon, 2010). Thus, we may also hypothesize a dentist’s perceived professional role by the characteristics of his/her patient base.

2.1.2 Predictors of a Professional Role

Rather than examining the dichotomy of health care professional and business person, Bruers et al.’s two studies used multivariable logistic regression to find the predictors of: (a) considering oneself business-oriented (enjoying the business aspects of dental practice) versus considering oneself task distribution-oriented (preferring to delegate business tasks to others) (Bruers, van Rossum, Felling, Truin, & van’t Hof, 2003); and (b) considering oneself patient-oriented versus profession-oriented (Bruers, Felling, Truin, van’t Hof, & van Rossum, 2004).

In the first study, Bruers et al. (2003) asked respondents to indicate the percentage they recognized themselves as a dentist “who is primarily focused on a career in dentistry and to whom well-organized practice management, financial results and good service to patients are important points of attention” (p. 259). Those who scored above the median were considered business-oriented. In multivariable analysis, large practice size and a higher level of professional satisfaction were positive predictors of a business orientation while female gender, collaborating with other dentists and treating other dentists’ patients on a regular basis were negative predictors. Respondents were also asked the percentage they recognized themselves as a dentist
“who has clear preferences with regard to the execution of professional tasks and who has tuned the practice organization as much as possible to these preferences by means of referring patients, getting patients referred, task delegation and work distribution” (p. 259). Similarly, those who scored above the median were considered task distribution-oriented. In multivariable analysis, large practice size, higher number of hours per week from hygienists and a preventive orientation predicted a task distribution orientation. The following variables were not significant: dental school, number of years in the profession, number of active chair-side hours per week, practice work load, whether or not the dentist’s partner worked in the practice, urban location, and number of collaborative contacts. Finally, the researchers found that a business orientation and a task distribution orientation were correlated.

In their 2004 study, Bruers et al. asked respondents to indicate the percentage they recognized themselves in the “ideal-typical description of a dentist who is distinctly patient-oriented in practising his profession” (p. 117). Being more preventively inclined, a higher level of professional satisfaction, professional seniority, and a higher number of hours per week spent on household tasks positively predicted a patient orientation. Interestingly, a higher number of hours per week support from hygienists was a negative predictor. The researchers hypothesized that the more hours per week that the hygienists were working in the practice, the more likely that the dentist left discussion to the hygienists. It made sense that a patient-oriented dentist was also preventively inclined, as such a dentist would have to make the effort to inform patients that they, too, are responsible for their oral health. The researchers suggested that older dentists were more patient-oriented, as they would know which questions to ask patients. Gender, having the dentist’s partner working in the practice, and number of collaborative contacts (defined as the number of dentists the respondents worked with, and the frequency the respondent saw colleagues’ patients or vice versa) were not significant predictors. Respondents were then asked
to what extent they recognized themselves in the “ideal-typical description of a dentist who is above all interested in the profession of dentistry” (p. 117). Similar to patient-oriented dentists, profession-oriented dentists were more likely to be preventively inclined and have a higher level of professional satisfaction. However, positive predictors of a profession orientation included a higher number of hygienist hours per week, having a partner working in the practice, and a higher number of collaborative contacts. Female gender was a negative predictor. The researchers hypothesized that dentists who were profession-oriented would be more likely to attend continuing education courses that endorsed preventive methods and to exchange ideas with colleagues. Dental school, number of active chair-side hours per week, practice work load, and being the sole breadwinner were not related to patient orientation or profession orientation.

2.2 Moral Inclusion, Moral Communities, and Moral Inclusiveness

This thesis examines treatment decisions in relation to dentists’ views on their professional roles but also by their concern for others. Using themes in social psychology and moral philosophy, this part of the literature review will examine how connectedness with others brings about concern for their well-being (Morselli & Passini, 2012; Opotow, 1990; Schwartz, 2007). Several concepts are of note. First, moral inclusion is the positive application of moral values, rules and considerations of fairness towards others (Opotow, 1990). Moral community is simply described as those whose well-being concerns us (Regan, 1983). Specifically, moral community is the group(s) of people to which we apply moral values, rules and considerations of fairness, i.e., moral inclusion (Opotow, 1990), and those whose interests we consciously take into account when we make decisions or social policies (Spohn, 1996). It can also be defined as those we grant full and equal moral status, i.e., those whose needs, interests, or well-being we
take into account in our deliberations (Warren, 1997). With respect to dentistry, someone who has equal moral status would be an equal participant in treatment decisions (Ozar, 1985). Moral community has also been referred to as “scope of justice” (Opotow, 1990), “circle of moral regard” (Reed & Aquino, 2003), and “moral universe” (Schwartz, 2007). Naturally, people extend moral inclusion to those they are close to, such as family or friends, or social groups they identify with, such as people who share the same gender, race, class, profession, religion or nationality (called their “in-groups”) (Schwartz, 2007; Spohn, 1996). In contrast, moral exclusion is the exclusion of others from our boundaries of fairness. Moral inclusiveness describes the breadth of one’s moral community or the extent of people’s concern for other groups. People who apply moral values only to their in-groups are described as having a narrow moral community, and thus, a low level of moral inclusiveness. Those who apply moral values to people who are different than themselves (“out-groups”) are described as having a broad moral community, or a high level of moral inclusiveness (Morselli & Passini, 2012; Schwartz, 2007; Spohn, 1996). Theoretically, people’s moral communities may span from only family and friends to all of society. However, for most, their moral communities fall somewhere in between (Spohn, 1996).

The outcomes of moral exclusion may range from severe, such as genocide and denial of basic human rights, to mild, such as unconcern or unawareness of others’ needs or entitlements to basic resources like health services, respect, and fair treatment (Opotow, 1990). Table 1 is a sample of moral exclusion processes that dentists may apply to out-groups. Though the harms that result from unconcern or from efforts to achieve one’s own goals may not involve malevolent intent, both severe and mild forms of moral exclusion share underlying characteristics (Opotow, 1990). They include: (a) seeing those excluded as psychologically distant from and unconnected with oneself; (b) lacking constructive moral obligations toward
those excluded; (c) viewing those excluded as nonentities, expendable, and undeserving of fairness and community resources that could foster their well-being; and (d) approving of procedures and outcomes for those excluded that would be unacceptable for those inside the scope of justice (Opotow, Gerson, & Woodside, 2005). While the processes of moral exclusion, especially in its mild forms, may be subtle and often institutionalized, “[t]hose who habitually employ them can perceive some people as objects and imperceptibly cross a threshold that excludes these others from their moral [community]” (Opotow, 1990, p. 12).

Table 1: Processes of Moral Exclusion (adapted from Opotow et al., 2005)

<table>
<thead>
<tr>
<th>Process</th>
<th>Manifestation in moral exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double standards</td>
<td>Having different norms for different groups</td>
</tr>
<tr>
<td>Reducing moral standards</td>
<td>Asserting that one’s harmful behavior is proper while denying one’s lesser concern for others</td>
</tr>
<tr>
<td>Biased evaluation of groups</td>
<td>Making unflattering between-group comparisons that bolster one’s own group at the expense of others</td>
</tr>
<tr>
<td>Condescension and derogation</td>
<td>Regarding others with disdain</td>
</tr>
<tr>
<td>Dehumanization</td>
<td>Denying others’ rights, entitlements, humanity, and dignity</td>
</tr>
<tr>
<td>Fear of contamination</td>
<td>Perceiving contact or alliances with other stakeholders as posing a threat to oneself</td>
</tr>
<tr>
<td>Victim blaming</td>
<td>Placing blame on those who are harmed</td>
</tr>
<tr>
<td>Deindividuation</td>
<td>Believing one’s contribution to social problems is undetectable</td>
</tr>
<tr>
<td>Diffusing responsibility</td>
<td>Denying personal responsibility for harms by seeing them as the result of collective rather than individual decisions and actions</td>
</tr>
<tr>
<td>Displacing responsibility</td>
<td>Identifying others, such as subordinates or supervisors, as responsible for harms inflicted on victims</td>
</tr>
</tbody>
</table>

In contrast, moral inclusion can be characterized by a willingness to: (a) extend fairness to others; (b) allocate resources to them; and (c) make sacrifices that would foster their well-
being (Opotow, 1990). Further, we are more likely to include people in our moral community when: (a) the person is perceived as similar to oneself rather than dissimilar; (b) the person is perceived as beneficial to oneself rather than harmful; and (c) conflict with the person is perceived as low rather than high (Opotow, 1990).

Social psychology studies have shown a positive relationship between moral inclusiveness and altruistic behaviour towards marginalized groups (Crimston et al., 2016; Morselli & Passini, 2012; Schwartz, 2007). Schwartz (2007) created a “Moral Inclusiveness Scale”, and investigated its relationship to perceptions of immigration and prosocial activity, such as donating to or volunteering in humanitarian organizations. The measure consisted of Likert-type scale questions on the following universalism values: equality (equal opportunity for all); social justice (correcting injustice, care for the weak); broadmindedness (tolerance of different ideas and beliefs); and a world at peace (free of wars and conflict). Administering the survey across 21 countries, he found that universalism values predicted accepting immigrants most strongly, followed by education. In another part of the study, in 15 of 17 countries, universalism values were significantly associated with prosocial activity. Universalism values were the strongest predictor of prosocial activity in four countries and second to education or income in 12 countries.

Morselli and Passini (2012) quantified the breadth of moral community by asking respondents to indicate their level of agreement with Likert-type scale questions such as “Members of this group deserve our utmost respect”. These questions were posed for several ethnic groups of varying similarity to the Italian respondents. The sum of the responses yielded the “Inclusion/Exclusion of Other Groups Scale” (IEG), which represented a general attitudinal orientation towards other groups. As predicted, IEG was negatively correlated with scales such as ones that measured prejudice and authoritarian submission, and positively correlated with
scales such as support for democracy and support for democratic principles. In general, sex and age did not have significant relationships to the IEG scale.

Similarly, Crimston et al. (2016), using the term “moral expansiveness” rather than moral inclusiveness, created a “Moral Expansiveness Scale” (MES). Respondents were asked to indicate their level of agreement for Likert-type scale questions about their moral concern and obligation towards several groups of people and entities, such as sentient and non-sentient beings. The sum of the responses yielded the MES. They found that those high in moral expansiveness were more likely to endorse universalism values and to base their moral judgments on considerations of the well-being of others and protecting them from harm.

2.2.1 Moral Inclusion and Moral Inclusiveness in the Dental Literature

While moral inclusion and moral inclusiveness have not been directly referred to in the medical and dental literature, these concepts may be considered an important part of dentists’ professionalism. First, morally inclusive values and the breadth of a dentist’s moral community have been alluded to in the theoretical literature and have been documented in professional codes of conduct. Whether or not dentists exhibit these values in practice may have some influence on the types of treatment decisions they make and on patient outcomes. Moreover, issues like access to care and oral health inequalities can only be tackled after understanding dentists’ moral inclusiveness.

Moral inclusion and moral inclusiveness have been discussed in the medical and dental literature under the following related concepts. We will first define them before evaluating them further. Altruism has been defined as placing the interest of the other above one’s own (Welie & Rule, 2006). Humanism is composed of the practitioner’s “attitudes and actions that demonstrate interest in and respect for the patient and that address the patient’s concerns and values” (Moyer
et al., 2010, p. 1800). Patient-centredness is comprised of effective communication between physician and patient, and a shared decision-making process. Effective communication includes an understanding of the patient’s life and how that contributes to their health, clear explanation to the patient of the issues, and showing respect for the patient (Ontario Medical Association, 2010). Social responsibility refers to the profession’s duty to address the health care needs of all members of the public (Welie, 2012). Given the above definitions, we may consider altruism to be one of the moral values that falls under moral inclusion. Humanism and patient-centredness may be manifestations of moral inclusion. Finally, social responsibility may be considered an outcome of moral inclusion and a measure of moral inclusiveness, as it represents dentists’ breadth of responsibility towards other groups.

We may also refer back to Ozar’s (1985) theoretical models of professionalism for references to moral inclusion and moral inclusiveness. When considering moral inclusiveness, dentists in the interactive model have the highest level of moral inclusiveness out of the three models as they have a commitment to serve their patients and the public at large. This commitment arises from the belief that the profession’s special status is granted by the community, after the profession has certified the dentist’s expertise. While dentists in the guild model similarly have a moral commitment to look after the health of their patients and the public, their first obligation is that to the guild, as it is the guild that grants dentists their special status. Lastly, in the commercial model, there are no obligations or commitments between individual dentists and individual patients, or between dentists, or between the profession and the public, except those obligations and commitments for which the individuals involved have deliberately bargained and committed themselves.

With respect to patient considerations in decision-making, the interactive model can be said to represent moral inclusion in the dentist-patient relationship. In this model, the dentist
considers the patient to have “equal moral status” and engages in a shared decision-making process. Health care decisions are a combination of the professional’s expertise and the patient’s choice, based on the patient’s own values, priorities and purposes. However, in the guild and commercial models, the dentist is not required to give the patient transparent explanation. The guild model represents the (now outdated) paternalistic model of decision-making, because the patient’s need for care is determined by the dentist. Though the dentist in the guild model wants what is the best for the patient, the dentist may steer the patient to what he/she feels is appropriate treatment, as the dentist believes patients do not always know what is best for them (McKinstry, 1992). Finally, in the commercial model, conversations between the dentist and patient are about the commodity and its price, and then the actual exchange of that commodity for the price that was agreed on. The dentist may offer opinions, but they must be taken in the context that they are to motivate the client to purchase services. In fact, the dentist in the commercial model “is concerned about the patient’s well-being only as a means of improving his or her own” (Ozar & Sokol, 2002, p. 49).

Bebeau et al. (1993), in their four models of professionalism, discussed moral inclusion and moral inclusiveness in terms of “authority” and “responsibility” (Table 2). Authority refers to the degree a person sees the self as knowledgeable and deferred to for expertise. People who have a strong sense of authority believe they typically know “what’s best” for themselves and others when dealing with matters in their profession. People for whom authority is not a critical part of their moral make up tend to believe that other people’s judgements are as deserving of consideration as their own. Responsibility refers to the breadth of an individual’s commitment to others. At the strong end, people see their role as including some direct or indirect care-taking of the disadvantaged and the public at large. On the weaker end, they believe each individual is
fully capable of taking care of him or herself. Thus, the service role can be said to represent fairness and high moral inclusiveness, due to its low authority and high responsibility.

**Table 2: Authority and Responsibility in Bebeau et al.’s (1993) Models of Professionalism**

<table>
<thead>
<tr>
<th>Professional Model</th>
<th>Authority</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Guild</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Service</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Agent</td>
<td>Low</td>
<td>Low</td>
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</table>

Morally inclusive values are further documented in professional codes of conduct, such as the Canadian Dental Association’s Principles of Ethics (2018) (Appendix B), which represent the normative values of the dental profession. Moral values, rules and considerations of fairness are represented in the statements that obligate dentists to treat all patients fairly, and practice “in a just and equitable manner”. Further, the dentist’s duty is to “provide care to, and promote the well-being of, all members of society; [and to] promote fair and reasonable access to quality oral health care without prejudice or discrimination, always regarding the patient as worthy of treatment”. With regards to giving the patient full and equal moral status, the code stipulates that a dentist must consider patient autonomy, with a duty to “respect the patient's right to choose”. Patients “have the right to be fully informed and make choices for, and actively participate in, their care and pursue their personal values, beliefs and goals in achieving their optimal oral health”. Considering patients’ needs, interests, or well-being in decisions is reflected in the code by the duty to “[further] the patient's well-being and [act] with moral concern to achieve a good outcome” and “act, first and foremost, for the benefit of, and in service to, the health of patients and the community”.
However, the literature suggests that principles of moral inclusion and moral inclusiveness may not be employed in actual practice. As autonomous practitioners, dentists are free to choose their patients. But with the freedom to do so, private dentists tend to select patients who are “healthy, employed, dentally conscious, compliant, middle-class...[and] for whom accessibility to private care is rarely a problem and who can generally afford necessary treatment (frequently assisted by insurance)” (Burt & Ekland, 2005, p. 33) – essentially, the same socioeconomic status as the dentist. Some dentists choose not to see poor patients altogether; the ones that do “can signal the message, often inadvertently, that they would prefer not to have to treat such patients” (Burt & Ekland, 2005, p. 34). For example, dentists may direct their staff to re-book patients who have missed an appointment if they have private insurance, but are less willing to do the same for those who pay by public insurance (Lévesque, Levine, & Bedos, 2016). They may categorize poor patients into “deserving” and “non-deserving”, perpetuating stereotypes of the poor (Lévesque, Levine, & Bedos, 2015; Loignon, Landry, Allison, Richard, & Bedos, 2012). Dentists also tend to communicate and collaborate less on health care decisions with low-income patients (Verlinde, De Laender, De Maesschalck, Deveugele, & Willems, 2012; Willems, De Maesschalck, Deveugele, Derese, & De Maeseneer, 2005). They may even discount procedures that are complex and/or expensive, giving reasons such as a lack of remuneration and patients’ lack of self-care (Bedos, Loignon, Landry, Allison, & Richard, 2013; Redford & Gift, 1997). They instead perform what Bedos et al. (2013) call “dentistry for the poor”, emergency dentistry or very basic care. Double standards, biased evaluation of groups and victim blaming represent processes of moral exclusion (Opotow, 1990).
2.2.2 Moral Inclusion and Treatment Decisions

There is a paucity of studies in the medical and dental literature that explicitly examine the relationship between moral inclusiveness and treatment decisions. Instead, researchers have studied clinical decision-making factors which may represent moral inclusion, such as patient influence and belief in information giving. Grembowski, Milgrom and Fiset (1991) found that dentists who cited patient influence as an important factor in treatment decisions performed fewer simple extractions than dentists with the opposite belief. However, dentists who rated patient preference (amongst a list of given factors) as important performed more simple extractions and fewer crowns. The research team acknowledged that these two findings about extractions seemed contradictory. Also, Grembowski, Milgrom and Fiset (1990) found that dentists who had a strong belief in the importance of giving information to patients had a significantly lower diagnostic rate compared to those who did not have such a belief. In another study, patients were given an initial oral assessment by calibrated hygienists, and their insurance records were tracked for the next two years to quantify any treatment rendered by fee-for-service private dentists (Grembowski et al., 1997). The research team found that there was higher odds of undertreatment (as compared to the initial oral assessments) when the dentist had a strong belief in information giving to patients.

Similarly, Brennan and Spencer (2002) studied the factor “patient preference”, which can represent moral inclusion, in relation to clinical procedures. They asked dentists via open-ended questions to list up to five factors that they considered important in choosing between two treatment options presented. Treatment pairs included crown versus amalgam, endodontic treatment versus extraction, and bridge versus denture. Dentists also recorded the services rendered for each patient regardless of payment type by patient. The factors influencing treatment choice within each pair scenario were grouped into conceptual categories. Cluster
analysis was used to identify dentists with similar views concerning factors influencing treatment choice. Dentists were grouped into the following clusters: patient preference factors, constraints (that were primarily cost factors), and oral health factors. Dentist and practice characteristics in the clusters did not show significant differences. Dentists who rated patient preference factors as most important had higher rates of preventive services and resins, which resulted in higher rates of restorative services. Those who rated cost as most important had higher rates of simple extractions with replacement with bridges and dentures. The researchers found that cost was the factor with the highest consideration when there were significantly cheaper alternatives, with patient preference a secondary factor. While rating cost as a major factor in treatment decisions could have indicated a conflict between dentists’ self-interest and patient’s interest, the researchers considered the hypothesis that dentists may have been acting in the role of patient agent or advocate (Maryniuk, 1990).

Brennan and Spencer (2008) then followed up with the same respondents in a study about the relationship between practice beliefs and service rates. Three of seven scales that the researchers created explained most of the variation in service rates. Scoring high on the “Preventive Orientation” scale was associated with lower rates of fillings, dentures, crowns, extractions and endodontic services, but higher rates of scaling. Scoring high on the “Professional Autonomy” scale was also associated with a less invasive approach, with lower rates of fillings, dentures and extractions. In contrast, scoring high on the “Patient Focus” scale was associated with a more invasive service pattern, with higher rates of dentures, crowns and extractions. There were few associations with dentist and practice characteristics. The researchers concluded that while practice beliefs tended to have small to moderate associations with service rates, the fact that they had significant relationships in multivariate models
suggested a pervasive influence. The researchers also noted that consistent differences in service rates could have a larger impact over time.

2.2.3 Predictors of a Broad Moral Community

Any instances in the dental literature of measuring moral inclusiveness or moral community have focused on dentists’ willingness to treat patients on public insurance (McKernan et al., 2015; Pourat, Roby, Wyn, & Marcus, 2007; Quiñonez et al., 2009). Rather than quantifying dentists’ social responsibility or moral inclusiveness, the literature has mostly looked at the predictors of accepting patients on public insurance, or the predictors of being a dentist who has a higher percentage of public insurance patients in the practice (versus lower percentage, with the cut-off usually at the median). For example, McKernan et al.’s (2015) study explored the relationship of American dentists’ demographic characteristics and attitudes to participation in Medicaid. In bivariate analysis, dentists living in non-metropolitan areas were significantly more likely to accept Medicaid than those in metropolitan areas. The researchers also constructed two multivariable logistic regression models, with participation in Medicaid as the outcome. The first model included all demographic characteristics entered as a block. The second model included attitudinal variables entered as a second block. Attitudes were measured by questions on dentists’ altruism (e.g. “Dentists have an ethical obligation to treat Medicaid patients”) and their views on Medicaid patients and the Medicaid program. The first model did not produce any significant predictors. Adding the attitudes in the second model increased the model’s predictive power, with attitudes significantly predicting the outcome over other demographic variables. Scoring higher on the altruism scale and perceiving problems with Medicaid as less important were significant predictors of accepting Medicaid patients.
Nicholson, Vujicic, Wanchek, Ziebert and Menezes (2015), examining the effect of debt on career choices, found that women and non-white dentists were more likely to accept poor patients (Medicaid and charity care). In Quiñonez et al. (2009), Canadian dentists in the youngest age categories (23–29 and 30–34 years of age) were significantly more likely to accept new publicly insured patients. Year of graduation, amount of public insurance in the practice, and the level of pro bono work had marginal positive effects. In a multivariable model, having a rural practice and having made a “business decision” to reduce the amount of public insurance in the practice were significant negative predictors of accepting new publicly insured patients.

Pourat et al. (2007) looked at the characteristics of dentists who were participants (seeing at least one Medicaid patient) versus non-participants in Medicaid, and active versus non-active in Medicaid programs (more than five percent of patients were publicly insured versus five percent or less). Participating dentists had practices that were generally geared toward the care of publicly insured patients, reflected by the types of care consistent with poorer oral health and accommodations to the needs of these patients. They more often accepted reduced fees and walk-in patients. They also had a higher percentage of minority patients and more multilingual capacity compared to non-participating dentists. Further, participating dentists were more likely to engage in practices that may be associated with maximizing income. They were more likely to set slightly shorter appointments per patient, spend less time in patient treatment, have more than one office location, work in larger practices with more staff, work full-time, report being busy or overworked, and pay lower wages to hygienist and dental assistant staff compared to non-participating dentists. Participating dentists may have been part of a cohort who were looking for employment opportunities, as they were more likely to be dentists with an average of two or less years in practice, contractors, associate dentists or foreign graduates. A similar pattern was observed when comparing active and non-active dentists. The inverse relationship of the number
of hygienists with dentist participation could represent dentists’ decisions to hire fewer such personnel, given the more pressing oral care needs of their patient population. Moreover, the researchers found that gender, race and ethnicity, specialty, years since graduation, solo practice, and practice ownership were associated with dentists’ participation in Medicaid, but none were significant predictors in the presence of other examined factors.

Additionally, studies of physicians’ patient-centredness, which may be considered a manifestation of moral inclusion, have revealed relationships with several demographic characteristics. It has been hypothesized that younger practitioners compared to older ones may be more likely to exhibit patient-centredness in practice, given the current instruction in doctor-patient communication which discourages paternalism (Gray, 2011). However, Gray (2011) found that physicians in their 40s were most likely to endorse shared decision-making with patients, compared to those in their 50s and 30s. Unexpectedly, those in their 30s emphasized the role of the patient in their own health and patient autonomy. Krupat et al. (2000), using the validated Patient-Practitioner Orientation Scale (PPOS) to measure patient-centredness, similarly found that physicians with an intermediate length of years in practice (11–20 years) had the highest patient-centredness scores, compared to the new and old physicians. Furthermore, in studies using the PPOS, females (Haidet et al., 2002; Krupat et al., 2000) and physicians of European American descent (Haidet et al., 2002) showed more patient-centredness.

Grembowski, Milgrom and Fiset (1988), determining dentists’ patient orientation by asking Likert-type scale questions on information giving and patient influence in treatment decisions, found that patient-oriented dentists tended to be solo practitioners, less preventively oriented, work longer hours, and have lower prices. The opposite relationship between dentists’ preventive and patient orientation was an unanticipated result. The researchers speculated that
dentists who were preventively oriented perhaps held strong views on how dentistry should be practiced, and were less likely to allow patient concerns to interfere with their style of practice.

2.3 Market Pressures and Dentists’ Professionalism

The market environment in dentistry has been implicated as a factor in the loss of dentists’ professionalism and adoption of a business mind-set (Boyd et al., 2008; Rule, 2010). Gordon and Batchelor’s (2007) study has shown how quickly the transformation can occur. The researchers measured the ethical responses of dentists at the beginning of their careers in the United Kingdom’s National Health Service (NHS) and twenty-four months later. Ethical responses were measured by nine hypothetical patient scenarios in which respondents had to choose whether or not they would accept the patient into the practice. Dentists’ ethical attitudes decreased in seven of the nine scenarios over the study’s span, meaning they would deny treatment to seven of the nine patients. More troubling was the fact that at the start of their NHS careers, 65% of dentists felt that dentistry was a profession as opposed to a business. After twenty-four months, it had dropped to 49%. At this stage, the majority (51%) felt general practice was more of a business than a professional activity.

Furthermore, in Öcek and Vatansever’s (2014) qualitative study, dentist-respondents felt market mechanisms forced them to adopt a business perspective and prevented them from fulfilling the basic requirements of professionalism. In fact, newly graduated dentists stated that their identity as entrepreneurs was more important than their identity as dentists on the grounds of concern about the future. Participants said that in a free market system, preventive treatment could be consciously ignored, while aesthetic and profitable treatments were preferred. Competence was defined by participants as having business skills and being able to follow new
technologies as a prerequisite of competition. New technologies rather than an integrated approach to general health was considered important.

In addition, the sociological literature has suggested that the breadth of one’s moral community can change contextually and depends on factors such as an individual’s beliefs on fairness, resource scarcity, the prevailing social order, and the existence of conflict between groups (Crosby & Lubin, 1990; Opotow, 1990; Reed & Aquino, 2003; Schwartz, 2007). The dental literature has also alluded to how the breadth of dentists’ moral communities can change with economic pressures. In Öcek and Vatansever’s (2014) study, the majority of dentists who were subject to the dental market limited their social responsibility to just the patients in their practices. They supported giving oral hygiene instruction or carrying out preventive procedures on patients, but not measures that would benefit society at large. On dentists’ social responsibility, Dharamsi, Pratt and MacEntee (2007) concluded that “[economics] was the bottom line against which other positions had to be justified” (p. 1585).

As such, the first two of three articles in this thesis will examine, in a market environment, dentists’ beliefs about their professional roles, their associated responsibilities, and their relationship to treatment decisions. The third article investigates the relationship between perceived professional roles and beliefs about fairness towards other groups; it argues that we must understand dentists’ moral inclusiveness if the profession wishes to tackle issues of access to care and oral health inequalities.
3 A Note on Survey Methodology

The survey used in this thesis (Appendix E) was created for a larger study on the factors that may have a relationship to treatment intensity, in collaboration with another dental public health student, Dr. Abdulrahman Ghoneim. After a review of the literature (Appendices C and D), a conceptual framework (Figure 1) was developed, which included the environmental, provider, practice, and patient factors that putatively influence dentists’ treatment intensity. Based on the conceptual framework, a 46-item survey was created, with questions on the first three factors, as well as ten case scenarios to gauge treatment intensity.

The five-point Likert-type scale survey questions used for measuring perceived professional role came from validated surveys (Appendix D). Questions 42a–e measured a health care professional orientation and questions 43a–d measured a business person orientation. The questions from Harris et al. (2014) were chosen for their high loadings on the domains of “duty to staff and patients” (representing a health care professional role) and “entrepreneurial commercialism” (representing a business person role) in factor analysis.

Additionally, questions 42a–e were chosen for their content relating to moral inclusiveness amongst dentists. Questions 42a and b were about moral inclusion at the individual patient level. Questions 42c–e were about moral inclusion at the group or societal level. Question 42a asked if dentists made an effort to understand and connect with patients, actions which are associated with moral inclusion (Opotow, 1990). Question 42b was about dentists giving patients equal moral status in decision-making (Ozar, 1985; Warren, 1997). Question 42c measured fairness towards out-groups (patients paying by public insurance). Questions 42d and e represented dentists’ willingness to make sacrifices for the well-being of out-groups (Opotow, 1990). Further details on the methodology are provided in the subsequent manuscripts.
Figure 1: Conceptual Framework of Factors That May Have a Relationship to Treatment Intensity

Environmental Factors
- Health care system – organization, financing, delivery
- Geographic location – urban, rural
- Community water fluoridation
- Dentist density
- Population density
- Market forces in health care system

Provider Factors
- Age
- Gender
- Ethnicity
- Years of practice
- Level of education – continuing education, graduate training
- Place of graduation
- Marital status
- Number of dependents
- Debt – student, practice, personal loans
- Practice ownership
- Number of work hours
- Income
- Tolerance of risk and uncertainty of diagnoses, dental procedures
- Rate of referrals to other practitioners
- Patient interaction style
- Perception of competition
- Perception of busyness
- Practice beliefs
- Ethics and professionalism – perceived professional role, moral inclusiveness

Practice Factors
- Practice type – general, specialty
- Age of practice
- Number of dentists
- Number of hygienists

Patient Factors
- Age
- Gender
- Ethnicity
- Socioeconomic status
- Insurance status
- General health
- Oral health
- Oral health literacy
- Patient preferences
- Marital status
- Number of dependents
- Previous dental experience
- Tolerance to risk
- Accessibility – physical and financial

Treatment Intensity
- High (Aggressive approach)
- Low (Conservative approach)
4 Journal Article 1: Perceived Professional Roles and Dentists’ Treatment Decisions

Yu, Bonnie, Ghoneim, Abdulrahman, Lawrence, Herenia, Glogauer, Michael, Quiñonez, Carlos
(To be submitted to Journal of Dental Research)

Abstract

Objective: To examine the relationship between dentists’ perceived professional role (PPR) – the belief that they are health care professionals versus business people – and treatment intensity, defined as the aggressiveness of treatment decisions.

Methods: A 46-item survey containing questions on dentists’ demographic, practice and professional characteristics was mailed to a random sample of 3,201 general dentists in Ontario, Canada’s most populated province. PPR was measured by visual analog scale and by Likert-type scale questions, which have been validated in the literature in terms of their ability to measure PPR. Treatment intensity was measured by a set of case scenarios, based on common clinical situations. Each case scenario had four treatment options of varying aggressiveness; the more aggressive the treatment option, the higher the assigned score. The sum of the scores for the case scenarios yielded a "treatment intensity score". Univariate, bivariate, and multivariable analysis was performed.

Results: One-thousand and seventy-five dentists returned usable surveys (33.6% response rate). When measuring PPR by visual analog scale, 92% of respondents identified as health care professionals and 8% business people. Dentists who identified as business people tended to have a higher treatment intensity compared to those who identified as health care professionals.
(p<0.1). When measuring PPR through Likert-type scale questions, dentists who agreed with the business-oriented questions tended to have a higher treatment intensity compared to those who disagreed with the questions (p<0.05). Multivariable logistic regression showed that years of practice, number of technologies used in a practice and perceiving other dentists as competitors rather than colleagues were significant predictors of a business person role.

Conclusions: Dentists’ PPRs had a significant relationship to the aggressiveness of treatment decisions. Demographic and practice characteristics also had significant relationships to PPR. These findings may have implications for public trust and dentistry’s status as a health care profession.

Keywords: clinical decision-making, dentist-patient relations, dentists’ practice patterns, professional ethics, surveys and questionnaires, unnecessary procedures

Introduction

In addition to being health care professionals who look after their patients’ well-being, dentists must act as business people to ensure the survival of their practices. As such, dentists’ clinical behaviour is said to be influenced by both financial incentives and professional codes and norms (Tickle et al., 2011). However, there is significant concern among leaders in dentistry and the public that dentists are basing treatment decisions more on economic considerations rather than patients’ health (Boyd et al., 2008; Masella, 2007; Öcek & Vatansever, 2014; Reid et al., 2014). Increasing student and practice debt, provider competition, the rise of consumerism among patients, as well as other market pressures, have been suggested to be causes in this dynamic (Boyd et al., 2008; Holden, 2017; Öcek & Vatansever, 2014).

From a normative perspective, health care professionals are to act altruistically to restore patients’ health (Welie, 2004a). They have the professional duty to fully inform patients of
treatment risks and options. And when doing so, patients may opt out of such procedures (Grembowski et al., 1997). In general, health care professionals are also expected to make treatment decisions based on patients’ health conditions and needs, and take a conservative approach to treatment. In contrast, from a business model perspective, dentists would base treatment decisions not on patient need, but on what services patients are willing to pay for and will give the dentists the greatest return for the least cost in time, effort and materials (Ozar, 1985). Thus, dentists who consider themselves primarily business people, and who are motivated by financial incentives, may be more invasive in treatment and/or more likely to emphasize profitable procedures (Boyd et al., 2008).

There is a paucity of empirical studies which look at the relationship between dentists’ perceived professional roles (PPR) and their treatment decisions. Instead of looking at such roles directly, Harris et al. (2014) used survey questions to classify dentists by their dominant institutional logics (prevailing systems of value), and then correlated the responses to dentist behaviour. The research team identified four institutional logics that dominated English general dentist practice: entrepreneurial commercialism (dentists exploiting technical and business opportunities for commercial gain); managerialism (dentists accounting for activity using administrative measurement systems); duty to staff and patients; and public good (Harris & Holt, 2013). The research team found a significant relationship between scoring high on the entrepreneurial commercialism questions and engaging in actions that were concerned with business survival of the practice. In the United Kingdom’s predominantly public dental care system, these actions included restricting high-cost treatment, over-representing patients’ diagnoses (as they wanted to meet minimum care targets), and giving different care to publicly and privately insured individuals.
With regards to the influence of PPR on specific clinical procedures, the business-oriented dentists in Öcek and Vatansever’s (2014) qualitative study felt that in a market environment, preventive treatments could be ignored and aesthetic and profitable treatments were preferred. While not directly investigating PPR, Naegele et al. (2010) compared the treatment decisions of dentists working in the private and public sector, representing dentists who could and could not be motivated by self-interest, respectively. Study participants had an initial exam and treatment plan done by a salaried public dentist. The research team then examined insurance records for the study participants who visited a private dentist within six months of the initial exam to quantify any treatment rendered by private dentists. They concluded that there was evidence of overtreatment, as the private dentists performed significantly more procedures than that noted in the treatment plan by the public dentists. It was argued that the public dentists did not have any motivation to record patients’ conditions inaccurately, as they had no financial incentives and were not the treating dentists.

Andersen’s study (2009), however, suggests that professional codes and norms can mitigate the effect of economic incentives on private dentists’ behaviour. The author compared the clinical activity of Danish private and public dentists for two preventive measures: sealants and toothbrush instruction. Seeing that private dentists delivered significantly less sealants than public dentists, the author hypothesized that it was due to the lack of financial incentives. On the other hand, private and public dentists did not differ significantly in toothbrush instruction, as there was a professional norm dictating that patients must receive such instruction.

To inform the debate on whether financial considerations or professional norms have an effect on dentists’ treatment decisions, we conducted an exploratory survey of a random sample of dentists in Ontario, Canada’s most populated province. This paper presents findings on the relationship between dentist’s PPR – the belief that they are health care professionals versus
business people – and treatment intensity, defined as the aggressiveness of treatment decisions. It will also explore any differences in the types of procedures performed between the two groups, and the demographic and practice characteristics that have a relationship to PPR.

Methods

The Health Research Ethics Board at the University of Toronto approved the research (protocol reference #33949). The sampling frame was the 2016 Royal College of Dental Surgeons of Ontario register, which included all dentists who held a valid license to practice in Ontario. Inclusion criteria was a generalist license. Exclusion criteria were: a specialist license; dentists who worked in settings not subject to the dental care market, e.g. dental school faculty, public health unit, etc.; dentists not in Ontario; and dentists who participated in the pilot testing of the survey. This resulted in a sampling frame of 7067 dentists.

The sample size calculation was based on Salant and Dillman (1994):

\[ n = \frac{(P)(1-P)}{(C/Z)^2} \]

where \( P \) is the proportion of the population expected to choose one of two responses, \( C \) the assumed sample error, and \( Z \) the zed statistic of the confidence interval. To achieve a sample with a maximum variance and standard confidence interval of 95 percent +/- 3%, \( n = \frac{(1.96)(0.5)}{(0.03)^2} = 1,067 \). Due to the historically low response rates from dental professionals (Hardigan, Succar, & Fleisher, 2012), this number was tripled. In 2017, using a random start, systematic sampling method, 3,201 dentists were invited to participate in the study. Three mailings of the survey were sent; the first with an introductory letter and survey, and the remaining with a short reminder and survey. Reminder mailings were only sent to those who had not responded to prior mailings. The incentive for survey completion was entry into a draw for one free continuing education course offered by the Faculty of Dentistry, University of Toronto.
Survey Creation

The data for this study came from a larger study which employed a 46-item survey with questions based on factors that the literature suggests has a relationship to treatment decision-making. It included questions on demographic characteristics, such as age and gender of the dentist; practice characteristics, such as age of the dental practice and number of hygienists employed; and professional characteristics, such as opinions on professional responsibilities. There were also questions to assess dentists’ perceptions about personal and market pressures, such as the size of student and practice loans and satisfaction with the level of busyness in their dental practices. The survey was pre-tested amongst a sample of University of Toronto teaching faculty for face and content validity before it was pilot tested with 20 general dentists for face validity and ease of completion.

PPR was measured by two methods. The first method was by visual analog scale. Along a 100mm line with the two ends labelled as “Health Care Professional” and “Business Person”, respondents were asked to place an ‘x’ where they perceived their role to be. The second method was a set of 5-point Likert-type scale questions that have been validated in the literature in terms of their ability to classify a respondent’s attitudes as that of a health care professional or a business person (Bebeau et al., 1993; Harris et al., 2014; Krupat et al., 2000). Five questions focused on health care professionals’ altruism and four focused on business practices in dentistry (Table 4). The questions were chosen for their high loadings on their respective factors in factor analysis and ease of understanding. It is important to note that this study did not have the intention to create and validate a scale to measure perceived professional role; rather, the objective was to do preliminary research on the relationship between PPR and treatment intensity.
To measure treatment intensity, respondents were asked to complete ten case scenarios, based on common clinical situations for a general dentist. For example, there were cases scenarios on the extraction of asymptomatic third molars, the frequency of recall appointments and radiographs, and placement of sealants in children. Each case scenario had four treatment options of varying aggressiveness; the most conservative option was scored as ‘1’ and the most aggressive as ‘4’. Aggressiveness of treatment options was determined from the literature and through expert consultation. The sum of the scores for the case scenarios yielded a “treatment intensity score”; a higher score meant a higher treatment intensity.

Statistical Methods

In terms of analyses, univariate, bivariate and multivariable analysis was performed using SPSS v. 23. Binary logistic regression was performed for variables which had significant relationships (p <0.1) to perceived professional role in chi-square tests. Variables that had significant relationships (p<0.05) in binary logistic regression were then entered as a block into multivariable logistic regression to find the dominant predictors for PPR.

Results

We received 1,075 usable surveys, giving a 33.6% response rate. The respondents’ demographic characteristics were compared to the membership records of the Ontario Dental Association, a voluntary professional organization whose membership comprises 90% of dentists with a valid licence to practice in Ontario (Table 3) (Ontario Dental Association [ODA], 2018). Respondents were comparable in terms of gender, place of initial dental training and practice
ownership, but not age or year of graduation; a greater proportion of older dentists responded to the survey.

Because the data were not normally distributed, the PPR visual analog scale was dichotomized. The visual analog scale was divided into “health care professional” (for those who marked an ‘x’ from 0 to 49 mm) and “business person” (for those who marked an ‘x’ from 51 to 100 mm), coded as ‘0’ and ‘1’ respectively. We excluded respondents who indicated they were equally health care professional and business person (score of 50), as we aimed to find the characteristics that would differentiate the two roles.

Similarly, the treatment intensity score was dichotomized at the median to delineate the “low” and “high” treatment intensity groups. Of note was the skewed distribution towards the low treatment intensity side. According to our scoring method, the minimum score would be 7 and maximum 28, based on seven case scenarios. We found that the median score was 15 and the 90th percentile score was 20. It seems that when dentists were asked how to treat a theoretical case, they tended to give the textbook answer. Also, as three of the ten case scenarios revealed little variability, the sum of seven case scenarios was used. The Spearman’s correlation for the sum of seven case scenarios and the sum of ten case scenarios was 0.958 at the 0.001 level.

Other variables that were dichotomized at the median due to the lack of a normal distribution included: percentage of diagnostic and preventive procedures (such as exams, x-rays, scaling, prophylaxis, sealants and fluoride); treatment procedures (such as restorations, endodontics and surgery); and elective procedures (such as cosmetic dentistry and orthodontics) performed per week; and percentage of patients who paid by private insurance, public insurance or out-of-pocket.

When using the visual analog scale to measure PPR, 92% of respondents identified as health care professionals and 8% as business people (n=925). Further, dentists who considered
themselves business people had a 58% greater odds (OR=1.58; 95% CI 0.97, 2.57) of having a higher treatment intensity, compared to those who considered themselves health care professionals, but this was marginally significant at a p-value of 0.064.

When examining the responses to the validated questions for classifying a respondent’s attitudes as that of a health care professional or a business person, we found that dentists generally agreed with both health care professional values and business practices in dentistry (Table 4). The exception was the final question, with 76.9% of respondents disagreeing with this statement: “Thinking about the financial implications for the practice when I advise patients of treatment options is important to me”.

The forest plot in Figure 2 summarizes the relationships between strongly agreeing or agreeing with the validated professional role questions and treatment intensity. Though many of the questions did not reach statistical significance, there was a clear trend. Strongly agreeing or agreeing with the health care professional questions (the first five in the forest plot) was associated with a low treatment intensity score and strongly agreeing or agreeing with the business person questions (the last four) was associated with a high treatment intensity score.

In addition, Mann-Whitney U tests were used to compare the distributions of the types of procedures performed per week by health care professionals and business people. There were significantly different distributions for elective and treatment procedures, but not diagnostic and preventive procedures. Business-oriented dentists spent more time performing elective procedures but less time performing treatment procedures than health care profession-oriented dentists.

Detailed results of the multivariable logistic regression are presented in Table 5. In binary logistic regression, dentists who had a greater number of years in practice, were owners or partners, performed a greater percentage of elective procedures per week, used a greater number
of technologies, and perceived other dentists to be competitors rather than colleagues had an increased odds of thinking of themselves to be business people rather than health care professionals. In multivariable logistic regression, number of years in practice, number of technologies used, and perceiving other dentists as competitors rather than colleagues were the dominant predictors of a business person role.

**Discussion**

Our study found that the predictors of a dentist identifying with a business person role were consistent with the literature. It has been suggested that as dentists progress through their careers, they become more aware of the economic realities of private dental practice (Gordon & Batchelor, 2007; Öcek & Vatansever, 2014). Coupled with the fact that older dentists are more likely than younger ones to own practices (Health Policy Institute, 2018), and are thus exposed more to the business aspects of dentistry, it is not surprising that a greater number of years of practice was associated with a greater odds of reporting a business person role. However, while being an owner/partner of a practice had a significant relationship to reporting a business person role, the relationship did not remain significant in the multivariable model. Further, the literature suggests that dentists who feel they have to market their practices may promote them as using new technologies and offering (elective) cosmetic procedures (Öcek & Vatansever, 2014). As seen in the bivariate analysis, those who were high technology users and those who performed a greater percentage of elective procedures per week were more likely to call themselves business people. But the relationship with elective procedures also disappears in the multivariable model. While not reaching statistical significance, we found that as the self-reported amount billed per hour to be profitable increased, so did the odds of reporting a business person role. Finally, our
study supports Bebeau et al.’s (1993) theoretical model that suggests that business-oriented dentists have the mindset that other dentists are competitors.

The fact that we have found significant relationships between demographic and practice characteristics and a business person role suggests that there is a distinct group of dentists who have a different set of attitudes, priorities and/or values compared to those who identify as health care professionals. What is more, these differences in ways of thinking may translate to differences in treatment decisions. Corroborating the literature, our study suggests that dentists who consider themselves business people tend to have a higher treatment intensity compared to those who consider themselves health care professionals. This finding may have serious implications. Dentists, under the social contract, are explicitly granted professional status by society in exchange for looking after the public’s well-being first and foremost (Welie, 2012). But agreeing with statements like “Thinking about the financial implications for the practice when I advise patients of treatment options is important to me” demonstrates that, for some dentists, economic considerations may have an equal, or even greater, influence in their treatment decisions. Consequently, such behaviour would erode public trust and threaten dentistry’s status as a health care profession.

While it is reassuring that that the majority of dentists agreed with statements that represented health care professional values, the majority also agreed with business practices in dentistry (except for the final question in Table 4). This may point to a general shift in dentists’ nature vis-à-vis professionalism. Though the respondents in our study may have had conflicts with the market approach to dentistry, they, like the participants in Öcek and Vatansever’s (2014) qualitative study, may have acknowledged it as a necessity for their practices to survive, or may even have internalized a business ethos. While Welie (2004a, 2004b, 2004c) has posited that the roles of health care professional and business person are contradictory, other authors
argue that professionalism and commercialism can co-exist (Harris et al., 2014; Harris & Holt, 2013; Holden, 2018). First, both professionalism and commercialism are premised on a good public reputation. In addition, for patients to have continuous care, a practice must be run sustainably. Further, the respondents in Harris and Holt’s (2013) qualitative study admitted that while financial considerations were an important part of dental practice, they countered this by listening to patients and offering services they wanted, like cosmetic dentistry. Also, as most dental treatments are seen as discretionary by patients (with the exceptions being emergencies such as trauma, uncontrolled bleeding, pain that is unmanageable with analgesics and spreading infection), dentists must understand patients’ consumer-like behaviour (such as shopping around or negotiating prices) and meet patients’ wants (Holden, 2018). As Holden (2018) has argued, business interests in dental practice are not inherently wrong; it is when they become the sole purpose of treatment that it becomes objectionable.

Strengths, Limitations, and Future Directions

Our exploratory study has the following strengths: we achieved our minimum sample size; it was representative of Ontario dentists, except for age and year of graduation; and it was relatively robust, as we investigated over 30 variables that could have a relationship to treatment intensity. Our limitations are the same as other cross-sectional studies which use survey data: causation cannot be inferred; there may be social desirability bias, non-response bias, and recall error; the items in the survey may not be factors associated with the outcome; and we may have missed other factors that may be associated with the outcome.

Ultimately, this is the first empirical study, to our knowledge, to investigate the relationship between PPR and treatment intensity. For future directions, analysis should be done to compare dentists who feel they are equally health care professionals and business persons to
ones who feel they are primarily health care professionals or business persons. Also, given the significant social desirability bias in our survey, further work should be done to refine the measures of PPR and treatment intensity.

Conclusions

Perceived professional role was found to have a significant relationship to treatment intensity and types of procedures rendered. Further, several demographic characteristics were found to be predictors of a business person role. Overall, if a group of dentists were found to have attitudes and/or values closely tied to business concerns, and base treatment decisions predominantly on factors other than patients’ health and preferences, then this may have implications for patient care and public trust. Importantly, under the social contract, society grants dentists their professional status in return for assurance that dentists place their patients’ needs above their own interests. This loss of altruism would endanger dentistry’s status as a health care profession.
Table 3: Respondents’ Characteristics

<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>Categories</th>
<th>n</th>
<th>Survey sample</th>
<th>Ontario Dental Association members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>700</td>
<td>65.5%</td>
<td>62.0%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>369</td>
<td>34.5%</td>
<td>38.0%</td>
</tr>
<tr>
<td>Age</td>
<td>40 and younger</td>
<td>154</td>
<td>14.4%</td>
<td>29.0%</td>
</tr>
<tr>
<td></td>
<td>41 to 50</td>
<td>274</td>
<td>25.7%</td>
<td>25.0%</td>
</tr>
<tr>
<td></td>
<td>51 to 60</td>
<td>325</td>
<td>30.4%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>61 and older</td>
<td>315</td>
<td>29.5%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Year of graduation</td>
<td>Before 1970</td>
<td>35</td>
<td>3.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td></td>
<td>1970 - 1979</td>
<td>184</td>
<td>17.8%</td>
<td>11.0%</td>
</tr>
<tr>
<td></td>
<td>1980 - 1989</td>
<td>302</td>
<td>29.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td></td>
<td>1990 - 1999</td>
<td>296</td>
<td>28.7%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>2000 - 2009</td>
<td>160</td>
<td>15.5%</td>
<td>24.0%</td>
</tr>
<tr>
<td></td>
<td>2010 - 2016</td>
<td>55</td>
<td>5.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Place of initial dental training</td>
<td>Canadian dental school</td>
<td>806</td>
<td>75.4%</td>
<td>71.0%</td>
</tr>
<tr>
<td></td>
<td>American dental school</td>
<td>84</td>
<td>7.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td></td>
<td>International dental school</td>
<td>179</td>
<td>16.7%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Practice ownership</td>
<td>Owner/Partner</td>
<td>777</td>
<td>73.3%</td>
<td>66.0%</td>
</tr>
<tr>
<td></td>
<td>Associate</td>
<td>283</td>
<td>26.7%</td>
<td>34.0%</td>
</tr>
</tbody>
</table>
Table 4: Dentists’ Level of Agreement with Perceived Professional Role Questions
[questions adapted from Bebeau et al. (1993); Harris et al. (2014); Krupat et al. (2000)]

<table>
<thead>
<tr>
<th>Perceived professional role question</th>
<th>Percentage*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to understand a patient’s culture and background in order to treat a patient’s illness. (n=1028) (Culture)</td>
<td>75.0</td>
<td>11.1</td>
<td>13.9</td>
</tr>
<tr>
<td>Patients should be treated as if they were partners with the dentist, equal in power and status. (n=1026) (Power)</td>
<td>71.0</td>
<td>13.7</td>
<td>15.3</td>
</tr>
<tr>
<td>That I provide an equally good standard of care whether working on publicly or privately insured patients is important to me. (n=1033) (Standard)</td>
<td>98.0</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Reducing inequalities in oral health across the population is important to me. (n=1022) (Inequalities)</td>
<td>79.3</td>
<td>5.3</td>
<td>15.5</td>
</tr>
<tr>
<td>Dentists should lobby for dental benefits for the disadvantaged. (n=1020) (Lobby)</td>
<td>69.2</td>
<td>6.9</td>
<td>23.9</td>
</tr>
<tr>
<td>Identifying new business opportunities for the practice is important to me. (n=1022) (Opportunities)</td>
<td>62.0</td>
<td>18.4</td>
<td>19.6</td>
</tr>
<tr>
<td>Positioning the practice in the marketplace is important to me. (n=1024) (Marketplace)</td>
<td>65.3</td>
<td>16.3</td>
<td>18.4</td>
</tr>
<tr>
<td>Having remuneration in line with my years of training/skills is important to me. (n=1022) (Remuneration)</td>
<td>81.5</td>
<td>5.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Thinking about the financial implications for the practice when I advise patients of treatment options is important to me. (n=1020) (Financial)</td>
<td>13.8</td>
<td>76.9</td>
<td>9.3</td>
</tr>
</tbody>
</table>

*may not add up to 100% due to rounding error
Figure 2: Relationships Between Strongly Agreeing or Agreeing with Perceived Professional Role Questions and Treatment Intensity
Table 5: Results of Logistic Regression Analyses for the Predictors of a Business Person Role

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Bivariate</th>
<th>Multivariable (n=747)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio (95% CI)</td>
<td>P</td>
</tr>
<tr>
<td>Years of practice (continuous)</td>
<td>1.028 (1.006, 1.050)</td>
<td>0.012</td>
</tr>
<tr>
<td>Amount billed per hour per chair to be profitable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $200 (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>200-300</td>
<td>1.279 (0.411, 3.982)</td>
<td>0.671</td>
</tr>
<tr>
<td>300-400</td>
<td>2.417 (0.814, 7.178)</td>
<td>0.112</td>
</tr>
<tr>
<td>400-500</td>
<td>2.732 (0.862, 8.658)</td>
<td>0.088</td>
</tr>
<tr>
<td>$500 or more</td>
<td>3.098 (0.964, 9.955)</td>
<td>0.058</td>
</tr>
<tr>
<td>Practice ownership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associate (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Partner/Owner</td>
<td>2.124 (1.125, 4.011)</td>
<td>0.020</td>
</tr>
<tr>
<td>Number of practices dentist is owner/partner in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 practice (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>2 or more practices</td>
<td>1.984 (0.979, 4.019)</td>
<td>0.057</td>
</tr>
<tr>
<td>Percentage of elective procedures per week*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 19% (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>20 – 100%</td>
<td>1.913 (1.140, 3.209)</td>
<td>0.014</td>
</tr>
<tr>
<td>Percentage of treatment procedures per week *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 59% (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>60 – 100%</td>
<td>0.647 (0.396, 1.060)</td>
<td>0.084</td>
</tr>
<tr>
<td>Number of technologies used*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 2 (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>3 or more</td>
<td>2.253 (1.362, 3.729)</td>
<td>0.002</td>
</tr>
<tr>
<td>Perception of other dentists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colleague (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Competitor</td>
<td>2.701 (1.537, 4.747)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

* continuous variable that was dichotomized at the median due to the lack of a normal distribution
5  Journal Article 2: Moral Inclusiveness, Moral Communities, and Dentists’ Treatment Decisions

Yu, Bonnie, Ghoneim, Abdulrahman, Lawrence, Herenia, Glogauer, Michael, Quiñonez, Carlos

(To be submitted to Community Dentistry and Oral Epidemiology)

Abstract

Objective: To examine the relationship between: moral inclusiveness, defined as the breadth of people’s moral communities, or the extent of people’s concern for other groups; and treatment intensity, defined as the aggressiveness of treatment decisions.

Methods: A 46-item survey containing questions on dentists’ demographic, practice and professional characteristics was mailed to a random sample of 3,201 general dentists in Ontario, Canada’s most populated province. Moral inclusiveness was measured by Likert-type scale questions and a “moral community score”. The score was the sum of the responses to a question about a dentist’s duty to care for several marginalized groups. Responses were assigned weights according to dentists’ inclusiveness towards each group. A higher score meant a broader moral community or higher level of moral inclusiveness. To measure treatment intensity, dentists picked treatment options for case scenarios based on common clinical situations, with the treatment options scored according to their level of aggressiveness. The sum of the responses was the “treatment intensity score”. A higher score meant a higher treatment intensity. Univariate, bivariate, and multivariable analysis was performed.

Results: One-thousand and seventy-five dentists returned usable surveys (33.6% response rate). The moral community and treatment intensity scores were dichotomized at the median,
giving narrow and broad moral community groups, and low and high treatment intensity groups respectively. Dentists with broad moral communities tended to have a lower treatment intensity compared to those with narrow moral communities. Multivariable logistic regression showed that female gender and perceiving other dentists as competitors rather than colleagues were significant predictors of a broad moral community.

Conclusions: Moral inclusiveness had a significant relationship to treatment intensity. Demographic and practice characteristics also had significant relationships to moral inclusiveness. These findings may have implications for public trust and dentistry’s status as a health care profession.

Keywords: clinical decision-making, dentist-patient relations, dentists’ practice patterns, professional ethics, social responsibility, surveys and questionnaires

Introduction

Leaders in dentistry and the public have expressed concern that there is an incongruence between the altruistic values dictated in professional codes of conduct and actual dentist behaviour (Welie & Rule, 2006). Specifically, there is the fear that dentists are basing treatment decisions more on financial considerations rather than their patients’ health needs. While the market environment in dentistry is considered a major factor in such behaviour (Boyd et al., 2008; Holden, 2017; Öcek & Vatansever, 2014), Rule and Welie have proposed an overarching reason for the challenges that dentistry faces: a lack of connectedness (Rule, 2010; Rule & Welie, 2009; Welie & Rule, 2006). Dentists who are not connected with their patients may fail to recognize their concerns or needs. Dentists who not are not connected with other practitioners may see them as competitors and act in ways to “get ahead”. Finally, dentists who are not
connected with their profession may not understand the importance of upholding ethical codes of conduct and succumb to the pressures of the market instead.

The social psychology literature has looked at how connectedness with others brings about concern for their well-being by using the concepts of moral inclusion and moral community (Morselli & Passini, 2012; Opotow, 1990; Schwartz, 2007). Moral inclusion is the positive application of moral values, rules and considerations of fairness towards others. Moral community is simply described as those whose well-being concerns us (Regan, 1983). Specifically, it is the group(s) of people we apply moral inclusion towards (Opotow, 1990), and those whose interests we consciously take into account when we make decisions or social policies (Spohn, 1996). Naturally, people extend moral inclusion to those they are close to, such as family or friends, or social groups they identify with, such as people who share the same gender, race, class, profession, religion or nationality (called their “in-groups”) (Schwartz, 2007; Spohn, 1996). In contrast, moral exclusion is the exclusion of others from our boundaries of fairness. Moral inclusiveness describes the breadth of one’s moral community or extent of concern for other groups. People who apply moral values only to those they are close to are described as having a narrow moral community, and thus, a low level of moral inclusiveness. Those who apply moral values to people who are different than themselves (“out-groups”) are described as having a broad moral community, or a high level of moral inclusiveness (Morselli & Passini, 2012; Schwartz, 2007; Spohn, 1996).

While the Canadian Dental Association’s code of ethics (2018) states that dentists must “practice in a just and equitable manner” and “[p]rovide care to, and promote the well-being of, all members of society” – principles which represents moral inclusion and moral inclusiveness – the literature suggests that some dentists may not act accordingly. With patients who have private insurance, dentists may be overly aggressive in treatments, and/or emphasize profitable,
often elective, procedures (Grembowski et al., 1997; Öcek & Vatansever, 2014). With patients who use public insurance, which has lower levels of remuneration compared to private insurance, dentists may exclude this group of patients from their practices altogether or act in ways that suggest that they would rather not see them (Burt & Ekland, 2005; Lévesque et al., 2015, 2016).

Social psychology studies have shown a positive relationship between moral inclusiveness and altruistic behaviour. Schwartz (2007) found significant relationships between moral inclusiveness, measured by Likert-type questions on universalism values, and favourable perceptions of immigration and participation in activities that benefit the wider society, such as donating to or volunteering in humanitarian organizations. Morselli and Passini (2012) quantified the breadth of moral community by asking respondents to indicate their level of agreement with Likert-type scale questions such as “Members of this group deserve our utmost respect”. These questions were posed for several ethnic groups of varying similarity to the Italian respondents. The sum of the responses yielded the “Inclusion/Exclusion of Other Groups Scale” (IEG), which represented a general attitudinal orientation towards other groups. The researchers found that IEG was negatively correlated with prejudice and authoritarian submission, and positively correlated with support for democracy and democratic principles. Similarly, Crimston et al. (2016), using the term “moral expansiveness” rather than moral inclusiveness, created a “Moral Expansiveness Scale” (MES). Respondents were asked to indicate their level of agreement for Likert-type scale questions about their moral concern and obligation towards several groups of people and entities, such as sentient and non-sentient beings. The sum of the responses yielded the MES. They found that those high in moral expansiveness were more likely to base their moral judgments on considerations of the well-being of others and protecting them from harm.
Given all of the above, there is a paucity of studies in the medical and dental literature that explicitly examine the relationship between moral inclusiveness and treatment decisions. Grembowski et al. looked at the relationship between clinical decision-making factors which may represent moral inclusion, such as patient influence and information giving, and patient treatment (Grembowski, Milgrom, & Fiset, 1990, 1991; Grembowski et al., 1997). They found that dentists who identified patient influence as an important factor in treatment decisions performed fewer simple extractions than dentists with the opposite belief (Grembowski et al., 1991). The research team also found that dentists who had a strong belief in the importance of giving information to patients had a significantly lower diagnostic rate compared to those who did not have such a belief (Grembowski et al., 1990). In another study (1997), patients were given an initial oral assessment by calibrated hygienists. The research team then tracked insurance records for the next two years to quantify any treatment rendered by fee-for-service private dentists. They found that there was higher odds of undertreatment (as compared to the initial oral assessments) when the dentist had a strong belief in information giving to patients.

This paper will examine the relationship between moral inclusiveness, measured by the breadth of dentists’ moral communities, and treatment intensity, defined as the aggressiveness of treatment decisions. It is hypothesized that dentists who have a high level of moral inclusiveness will prioritize patient considerations in their treatment decisions, and take a more conservative treatment approach. This study will also explore any differences in the types of procedures performed by dentists of varying moral inclusiveness, and the demographic and practice characteristics that may have a relationship to moral inclusiveness.
Methods

The Health Research Ethics Board at the University of Toronto approved the research (protocol reference #33949). The sampling frame was the 2016 Royal College of Dental Surgeons of Ontario register, which included all dentists who held a valid license to practice in Ontario, Canada’s most populated province. The inclusion criterion was a generalist license. Exclusion criteria were: a specialist license; dentists who worked in settings not subject to the dental care market, e.g. dental school faculty, public health unit, etc.; dentists not in Ontario; and dentists who participated in the pilot testing of the survey. This resulted in a sampling frame of 7067 dentists.

We used the following equation to calculate our minimum sample size:

\[ n = \frac{P(1-P)}{C/Z^2}, \]

where \( P \) is the proportion of the population expected to choose one of two responses, \( C \) the assumed sample error, and \( Z \) the zed statistic of the confidence interval (Salant & Dillman, 1994). The following achieved a sample with a maximum variance and standard confidence interval of 95% +/- 3%: \( n = \frac{(1.96)(0.5)}{(0.03)^2} = 1,067 \). Due to the historically low response rates from dental professionals (Hardigan et al., 2012), this number was tripled. In 2017, using a random start, systematic sampling method, 3,201 dentists were chosen from the sampling frame and invited to participate in the study. Three mailings of the survey were sent; the first with an introductory letter and survey, and the remaining with a short reminder and survey. Reminder mailings were only sent to those who had not responded to prior mailings. The incentive for survey completion was entry into a draw for one free continuing education course offered by the Faculty of Dentistry, University of Toronto.
Survey Creation

A 46-item survey was created based on factors that the literature suggests has a relationship to treatment decision-making. It included questions on demographic characteristics, such as age and gender of the dentist; practice characteristics, such as the percentage of patients who pay by private insurance, public insurance or out-of-pocket, and the percentage of time devoted to specific dental procedures per week; and professional characteristics, such as opinions on professional responsibilities. There were also questions to assess dentists’ perceptions about personal and market pressures, such as the size of student and practice loans and satisfaction with the level of busyness in their dental practices. A referral score was calculated by summing the responses to four-point Likert-type scale questions on dentists’ frequency of referral for a list of dental procedures. A higher score meant a higher rate of referral. The survey was then pre-tested amongst a sample of University of Toronto teaching faculty for face and content validity before it was pilot tested with 20 general dentists for face validity and ease of completion.

Moral inclusiveness was measured by two methods. The first method was by 5-point Likert-type scale questions (Table 7). While the questions have been validated in the literature to test whether a respondent’s attitudes are consistent with those of a health care professional (Bebeau et al., 1993; Harris et al., 2014; Krupat et al., 2000), their content also represented attitudes associated with high moral inclusiveness.

The second method was a “moral community score”, which measured the breadth of dentists’ moral communities. Respondents were asked: “To which patient populations do you think you have a duty to care? Please state your level of agreement for each of the following groups.” This 5-point Likert-type scale question was posed for several social groups: population at-large; all patients in my practice; low-income children; low-income adults; low-income seniors; and adults on social assistance. To calculate the moral community score, we first
assigned weights to the dentists’ ranking of their duty to care. “Not sure”, “Disagree”, and “Strongly disagree” were given a weight of ‘1’ to represent the lowest level of moral inclusiveness. “Agree” and “Strongly agree” were weighted as ‘2’ and ‘3’, to represent a high and the highest levels of moral inclusiveness, respectively. Next, weights were applied to the social groups to represent dentists’ levels of moral inclusiveness. Dentists who worked with patients most different than themselves would be considered to have the highest level of moral inclusiveness. As “population at-large”, “low-income adults”, and “adults on social assistance” were the most different than dentists, these groups were given the highest weight of ‘3’. Further, Burt and Ekland (2005) have suggested that private dentists’ offices are composed mainly of patients similar in socio-economic status as themselves. Thus, “All patients in my practice” would be most similar to dentists and received a weight of ‘1’. Low-income children and low-income seniors received the intermediate weight of ‘2’ as the literature has suggested that dentists and society consider these groups as “deserving” of assistance (Quiñonez, 2009). Finally, for each of the six social groups, the dentists’ ranking of their duty to care was multiplied by the social group weight. The sum yielded the moral community score, with a minimum score of 14 and a maximum of 42. A higher score meant a higher level of moral inclusiveness or a broader moral community. It is important to note that this study did not have the intention to create and validate a scale to measure moral inclusiveness in dentists; rather, the objective was to do preliminary research on the relationship between moral inclusiveness and treatment intensity.

Treatment intensity was measured by a set of ten case scenarios, based on common clinical situations for a general dentist. For example, there were cases scenarios on the extraction of asymptomatic third molars, the frequency of recall appointments and radiographs, and placement of sealants in children. Each case scenario had four treatment options of varying
aggressiveness; the most conservative option was scored as ‘1’ and the most aggressive as ‘4’.

Aggressiveness of treatment options was determined from the literature and through expert consultation. The sum of the scores for the case scenarios yielded a “treatment intensity score”; a higher score meant a higher treatment intensity.

Statistical Methods

In terms of analyses, univariate, bivariate and multivariable analysis was performed using SPSS v. 23. Binary logistic regression was performed for variables which had significant relationships (p <0.1) to the outcome, breadth of moral community, in chi-square tests. Variables that had significant relationships (p<0.05) in binary logistic regression were then entered as a block into multivariable logistic regression to find the dominant predictors for the outcome.

Results

We received 1,075 usable surveys, giving a 33.6% response rate. The respondents’ demographic characteristics were compared to the membership records of the Ontario Dental Association, a voluntary professional organization whose membership comprises 90% of dentists with a valid licence to practice in Ontario (Table 6) (ODA, 2018). Respondents were comparable in terms of gender, place of initial dental training and practice ownership, but not age or year of graduation; a greater proportion of older dentists responded to the survey.

Due to the respondents’ propensity to pick the conservative options in the case scenarios and the subsequent skewed distribution towards the low treatment intensity side, the treatment intensity score was dichotomized at the median to delineate the “low” and “high” treatment intensity groups. We found that the median score was 15 and the 90th percentile score was 20. It
seems that when dentists were asked how to treat a theoretical case, they tended to give the textbook answer. Also, as three of the ten case scenarios revealed little variability, the sum of seven case scenarios was used. Thus, the minimum score would be 7 and maximum 28. The Spearman’s correlation for the sum of seven case scenarios and the sum of ten case scenarios was 0.958 at the 0.001 level, showing that these two sums were highly correlated.

Other variables that were dichotomized at the median due to the lack of a normal distribution included the referral score, percentages of specific clinical procedures performed per week, and percentages of patients who paid by private insurance, public insurance, and out-of-pocket. We also grouped the clinical procedures into the following types and dichotomized them at the median: percentage of diagnostic and preventive procedures (such as exams, x-rays, scaling, prophylaxis, sealants and fluoride); treatment procedures (such as restorations, endodontics and surgery); and elective procedures (such as cosmetic dentistry and orthodontics) performed per week.

When examining the responses to the Likert-type scale questions representing moral inclusiveness, Table 7 shows that most dentists strongly agreed or agreed with such attitudes. Table 8 shows the relationships between the moral inclusiveness questions and treatment intensity. Though many of the questions did not reach statistical significance, there was a trend. Strongly agreeing or agreeing with the moral inclusiveness questions was associated with a low treatment intensity.

When measuring moral inclusiveness by the moral community score, we found that the data were not normally distributed, with negative skewness. The moral community score was thus dichotomized at the median to delineate the “narrow” and “broad” moral community groups. Among 1005 respondents, 42.5% and 57.5% of respondents had narrow and broad moral communities respectively. The most common score was the maximum score of ‘42’, given by
23.8% of respondents. Further analysis was conducted to compare the demographic and practice characteristics of dentists who had the maximum score to the remaining respondents with lower scores. Bivariate analysis showed that there were generally no significant differences between the two groups. However, those who had the maximum score had a 39% greater odds (OR = 1.39; 95% CI 1.01, 1.91) of having a greater percentage of patients pay by public insurance in their practices than those who had a lower moral community score.

Importantly, dentists who had a broad moral community had a 20% lesser odds (OR = 0.80; 95% CI 0.62, 1.02) of having a high treatment intensity, but this was marginally significant (p = 0.073). Mann-Whitney U tests were used to compare the distributions of the percentages of procedures performed per week by dentists with narrow and broad moral communities. There was a significantly different distribution for the percentage of cosmetic dentistry procedures performed per week, with the broad moral community group performing less cosmetic dentistry. But there were no significant differences between the narrow and broad moral community groups with respect to the percentages of the other procedures we examined: diagnostic and preventive (such as exams, x-rays, scaling, prophylaxis, sealants and fluoride), endodontic, surgical, full-mouth reconstruction, implant placement, orthodontic, fixed prosthodontic, removable prosthodontic or restorative procedures.

Table 9 shows the detailed results of the logistic regression analyses to find the significant predictors of having a broad moral community. In binary logistic regression, female gender, less years of practice (0–10 years), perceiving one’s student loans to be medium or large compared to small, higher number of patients per day (9 or more), performing fewer treatment procedures per week (0–69%), a higher referral rate, perceiving other dentists to be colleagues rather than competitors, and feeling no or a small amount of pressure from other dental practices compared to medium or large pressure were associated with an increased odds of having a broad
moral community. Dissatisfaction with practice busyness had a negative relationship with moral community breadth. In multivariable logistic regression, female gender and perceiving other dentists to be colleagues rather than competitors were the dominant predictors of a broad moral community.

Discussion

In line with the literature, which has reported women to be more caring, empathetic, patient-centred (Haidet et al., 2002; Hojat et al., 2001; Krupat et al., 2000), and more likely to accept poor patients (Medicaid and charity care) (Nicholson et al., 2015), we found female gender to be a significant predictor of a broad moral community. Also, the relationship between less years of practice (0–10 years) and a broad moral community may be related to the recent incorporation of ethics instruction and patient-centred, humanistic practice into medical and dental school teaching (Gray, 2011; Moyer et al., 2010). Further, we found that dentists with broad moral communities tended to perform a lower percentage of treatment procedures per week. This can be expected, as when dentists fully inform patients of invasive procedures, patients may tend to opt out of them (Grembowski et al., 1997).

More importantly, the sociological literature has suggested that the breadth of one’s moral community can change contextually (Opotow, 1990). Dental researchers have similarly concluded that dentists who felt substantial pressure from market forces had less expression of an ethical obligation to serve society at large (Dharamsi et al., 2007; Harris et al., 2014; Öcek & Vatansever, 2014). Our bivariate results support this relationship between market pressures and dentists’ moral inclusiveness. Dentists who felt little pressure from market forces (as shown by rating their perceived pressure from other dental clinics as none or small, or considering other
dentists to be colleagues rather than competitors) had a greater odds of having a broad moral community. It can also be argued that when dentists reach a “satisfactory” level of income, measured by their satisfaction with their practices’ busyness and willingness to refer patients to other practitioners, they will then be more likely to devote their attention to “less profitable” patients. Compared to dentists who were very satisfied with their practices’ busyness, those who were either satisfied, dissatisfied or very dissatisfied with their practices’ busyness had a lower odds of a broad moral community. Further, those who had a high referral score tended to have broad moral communities. In addition, when a dentist’s practice is composed of a great number of low-income patients, the dentist may need to see more patients per day to make up for the lower levels of remuneration compared to a practice composed only of patients with private insurance. We found that a higher number of patients seen per day was associated with a broad moral community. However, there was the unexpected finding that those who perceived their student loans to be medium or large compared to small had an increased odds of a broad moral community. Perhaps dentists with such debt may be more sympathetic to others with financial instability.

Essentially, this study’s main objective was to measure dentists’ general concern for others, and examine its relationship to the aggressiveness of treatment decisions. Our results suggest that a high level of moral inclusiveness is associated with low treatment intensity. When dentists place high priority on patient considerations, and fully inform them of treatment plans, this will likely result in more conservative treatment choices (Grembowski et al., 1997). Furthermore, patients expect dentists to exhibit morally inclusive values, such as altruism, even in the face of economic pressures (Welie, 2004b). But the fact that we have found relationships between demographic and practice characteristics and the breadth of dentists’ moral communities suggests that dentists differ in their moral inclusiveness. And if it were found that
dentists’ variation in moral inclusiveness did indeed have an impact on treatment decisions, this would erode public trust and threaten dentistry’s status as a health care profession. Dentists, under the social contract, are explicitly granted professional status by society in exchange for looking after the public’s well-being first and foremost (Welie, 2012).

**Strengths, Limitations, and Future Directions**

Our exploratory study has the following strengths: we achieved our minimum sample size; it was representative of Ontario dentists, except for age and year of graduation; and it was relatively robust, as we investigated over 30 variables that could have a relationship to treatment intensity. Our limitations are the same as other cross-sectional studies which use survey data: causation cannot be inferred; there may be social desirability bias, non-response bias, and recall error; the items in the survey may not be factors associated with the outcome; and we may have missed other factors that may be associated with the outcome.

This is the first empirical study, to our knowledge, to investigate the relationship between moral inclusiveness and treatment intensity. Because there were no previous scales to measure the moral inclusiveness of health care professionals, the development of the moral inclusiveness questions and moral community score posed challenges of construct validity. However, as our results included significant relationships between exposure and outcome variables that supported the literature and/or made inherent sense, this exploratory study may lay the preliminary groundwork for the development of a moral inclusiveness scale for health care professionals. Also, while our study’s objectives did not include validation of our measures of moral inclusiveness, the Cronbach’s alpha for the five questions which represented moral inclusiveness was found to be 0.63. Although not reaching the recommended level of 0.7, our Cronbach’s
alpha may still be considered a reasonable level of internal consistency, given this set of questions aimed to measure a broad construct with a small number of items (Spiliotopoulou, 2009). As Cronbach’s alpha is known to increase with the number of items in the scale, it has been suggested that we cannot always divide outcome measures as reliable or unreliable based on rigid benchmarks (i.e., the 0.70 benchmark) (Voss, Stem, & Fotopoulos, 2000). Finally, given the significant social desirability bias in our survey, further work should be done to refine the measure of treatment intensity.

Conclusions

Moral inclusiveness was found to have a relationship to treatment intensity. Further, several demographic and practice characteristics were found to be predictors of a broad moral community. Our results also corroborate the literature on the relationship between market pressures and dentists’ moral inclusiveness. Importantly, the public expects dentists to be morally inclusive and have broad moral communities, even in the face of economic pressures. But if it were found that there were significant differences in dentists’ moral inclusiveness, and that it led to differences in treatment decisions, this would constitute dentists not fulfilling their end of the social contract. Consequently, this would have serious implications for public trust and dentistry’s status as a health care profession.
Table 6: Respondents’ Characteristics

<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>Categories</th>
<th>n</th>
<th>Survey sample</th>
<th>Ontario Dental Association members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>700</td>
<td>65.5%</td>
<td>62.0%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>369</td>
<td>34.5%</td>
<td>38.0%</td>
</tr>
<tr>
<td>Age</td>
<td>40 and younger</td>
<td>154</td>
<td>14.4%</td>
<td>29.0%</td>
</tr>
<tr>
<td></td>
<td>41 to 50</td>
<td>274</td>
<td>25.7%</td>
<td>25.0%</td>
</tr>
<tr>
<td></td>
<td>51 to 60</td>
<td>325</td>
<td>30.4%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>61 and older</td>
<td>315</td>
<td>29.5%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Year of graduation</td>
<td>Before 1970</td>
<td>35</td>
<td>3.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td></td>
<td>1970 - 1979</td>
<td>184</td>
<td>17.8%</td>
<td>11.0%</td>
</tr>
<tr>
<td></td>
<td>1980 - 1989</td>
<td>302</td>
<td>29.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td></td>
<td>1990 - 1999</td>
<td>296</td>
<td>28.7%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>2000 - 2009</td>
<td>160</td>
<td>15.5%</td>
<td>24.0%</td>
</tr>
<tr>
<td></td>
<td>2010 - 2016</td>
<td>55</td>
<td>5.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Place of initial dental training</td>
<td>Canadian dental school</td>
<td>806</td>
<td>75.4%</td>
<td>71.0%</td>
</tr>
<tr>
<td></td>
<td>American dental school</td>
<td>84</td>
<td>7.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td></td>
<td>International dental school</td>
<td>179</td>
<td>16.7%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Practice ownership</td>
<td>Owner/Partner</td>
<td>777</td>
<td>73.3%</td>
<td>66.0%</td>
</tr>
<tr>
<td></td>
<td>Associate</td>
<td>283</td>
<td>26.7%</td>
<td>34.0%</td>
</tr>
</tbody>
</table>
Table 7: Dentists’ Level of Agreement with Moral Inclusiveness Questions [questions adapted from Bebeau et al. (1993); Harris et al. (2014); Krupat et al. (2000)]

<table>
<thead>
<tr>
<th>Moral inclusiveness question</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly agree/ agree</td>
</tr>
<tr>
<td>It is important to understand a patient’s culture and background in order to treat a patient’s illness. (n=1028)</td>
<td>75.0</td>
</tr>
<tr>
<td>Patients should be treated as if they were partners with the dentist, equal in power and status. (n=1026)</td>
<td>71.0</td>
</tr>
<tr>
<td>That I provide an equally good standard of care whether working on publicly or privately insured patients is important to me. (n=1033)</td>
<td>98.0</td>
</tr>
<tr>
<td>Reducing inequalities in oral health across the population is important to me. (n=1022)</td>
<td>79.3</td>
</tr>
<tr>
<td>Dentists should lobby for dental benefits for the disadvantaged. (n=1020)</td>
<td>69.2</td>
</tr>
</tbody>
</table>

*may not add up to 100% due to rounding error
Table 8: Relationships Between Strongly Agreeing or Agreeing with Moral Inclusiveness Questions and Treatment Intensity

<table>
<thead>
<tr>
<th>Moral inclusiveness question</th>
<th>Odds ratio (95% CI) for high treatment intensity</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to understand a patient’s culture and background in order to treat a patient’s illness.</td>
<td>1.149 (0.775, 1.704)</td>
<td>0.489</td>
</tr>
<tr>
<td>Patients should be treated as if they were partners with the dentist, equal in power and status.</td>
<td>0.693 (0.482, 0.998)</td>
<td>0.049</td>
</tr>
<tr>
<td>That I provide an equally good standard of care whether working on publicly or privately insured patients is important to me.</td>
<td>0.376 (0.099, 1.427)</td>
<td>0.151</td>
</tr>
<tr>
<td>Reducing inequalities in oral health across the population is important to me.</td>
<td>0.724 (0.415, 1.263)</td>
<td>0.255</td>
</tr>
<tr>
<td>Dentists should lobby for dental benefits for the disadvantaged.</td>
<td>0.918 (0.562, 1.501)</td>
<td>0.733</td>
</tr>
</tbody>
</table>
Table 9: Logistic Regression Analyses for the Predictors of a Broad Moral Community

<table>
<thead>
<tr>
<th></th>
<th>Bivariate</th>
<th>Multivariable (n=336)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio (95% CI)</td>
<td>P</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>1.429 (1.092, 1.869)</td>
<td>0.009</td>
</tr>
<tr>
<td>Years of practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 10 years</td>
<td>1.563 (1.015, 2.407)</td>
<td>0.042</td>
</tr>
<tr>
<td>More than 10 years (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Perception of student loans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Medium</td>
<td>1.665 (1.080, 2.566)</td>
<td>0.021</td>
</tr>
<tr>
<td>Large</td>
<td>1.524 (0.974, 2.385)</td>
<td>0.065</td>
</tr>
<tr>
<td>Number of patients per day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – 8 (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>9 or more</td>
<td>1.294 (1.006, 1.666)</td>
<td>0.045</td>
</tr>
<tr>
<td>Satisfaction with practice busyness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very satisfied (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td>0.708 (0.518, 0.970)</td>
<td>0.031</td>
</tr>
<tr>
<td>Somewhat dissatisfied</td>
<td>0.558 (0.382, 0.815)</td>
<td>0.003</td>
</tr>
<tr>
<td>Very dissatisfied</td>
<td>0.845 (0.436, 1.635)</td>
<td>0.017</td>
</tr>
<tr>
<td>Percentage of treatment procedures per week*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 59%</td>
<td>1.261 (0.977, 1.629)</td>
<td>0.075</td>
</tr>
<tr>
<td>60 – 100% (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Referral rate*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>High</td>
<td>1.360 (1.032, 1.791)</td>
<td>0.029</td>
</tr>
<tr>
<td>Perception of other dentists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitor (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Colleague</td>
<td>1.578 (1.115, 2.232)</td>
<td>0.010</td>
</tr>
<tr>
<td>Perceived pressure from other dental practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium/Large amount of pressure (reference)</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Do not feel pressure/Small amount of pressure</td>
<td>1.406 (1.081, 1.828)</td>
<td>0.011</td>
</tr>
</tbody>
</table>

*continuous variable that was dichotomized at the median due to the lack of a normal distribution
Journal Article 3: Do dentists’ views on professionalism include moral inclusiveness?

Yu, Bonnie, Ghoneim, Abdulrahman, Lawrence, Herenia, Glogauer, Michael, Quiñonez, Carlos
(To be submitted to Community Dentistry and Oral Epidemiology)

Abstract

Objective: To examine the relationship between: perceived professional role (PPR), defined as the dentists’ belief that they are health care professionals versus business people; and moral inclusiveness, defined as the breadth of people’s moral communities, or extent of people we apply moral values, rules and considerations of fairness towards.

Methods: A 46-item survey containing questions on dentists’ demographic, practice and professional characteristics was mailed to a random sample of 3,201 general dentists in Ontario, Canada. PPR was measured by visual analog scale and by Likert-type scale questions, which have been validated in the literature in terms of their ability to measure PPR. Moral inclusiveness was measured by a “moral community score”, which was the sum of the responses to a question about the dentist’s duty to care for several marginalized groups. Responses were assigned weights according to dentists’ inclusiveness towards each group. A higher score meant a higher level of moral inclusiveness. Univariate, bivariate and multivariable analysis was performed.

Results: One-thousand and seventy-five dentists returned usable surveys (33.6% response rate). The visual analog scale and moral community score were dichotomized into “health care professional” and “business person”, and “broad” and “narrow” moral community respectively. Dentists identifying as health care professionals by visual analog scale had a 38% greater odds of
having a broad moral community, but the relationship was insignificant. Also, there was a trend for dentists who agreed with the Likert-type scale questions representing health care professional values to have a broader moral community compared to those who disagreed with the questions. In multivariable logistic regression, agreeing with health care professional values significantly predicted a broad moral community over demographic and practice variables.

Conclusions: PPR had a significant relationship to moral inclusiveness. These findings may have implications for patient care and dentistry’s status as a health care profession.

Keywords: dentist-patient relations, dentists’ practice patterns, professional ethics, professional role, social responsibility, surveys and questionnaires

Introduction

Lack of access to dental care is a major issue for low-income populations, contributing to their disproportionate burden of oral disease (Burt & Eklund, 2005; Canadian Academy of Health Sciences [CAHS], 2014). Some have argued that the dental profession is in a stalemate with respect to what should be done to decrease these inequalities (Welie, 2006). While some subscribe to the market to distribute dental care efficiently and call for welfare and other public mechanisms to correct disparities, others notice the influence of the social determinants on health, and argue that the market discriminates against the least advantaged (CAHS, 2014; Dharamsi, 2006). Welie (2006) poses the provocative question: are oral health inequalities unfortunate or unfair? He argues that if we believe oral health inequalities to be unfortunate, then doing something about it would be laudable, but not required. However, if we believe oral health inequalities to be not only unfortunate, but also unfair, then not doing something about it would be morally wrong. Consequently, the profession would be obligated to do something about the disparities.
If the profession is to tackle oral health inequalities, we must first understand dentists’ attitudes on fairness towards other groups. Social psychology has studied people’s propensity to engage in fair behaviour with others using the concepts of moral inclusion and moral community (Morselli & Passini, 2012; Opotow, 1990; Schwartz, 2007). Moral inclusion is the positive application of moral values, rules and considerations of fairness towards others. Moral community, simply put, consists of those whose well-being concerns us (Regan, 1983). Specifically, it is the group(s) of people to whom we apply moral inclusion (Opotow, 1990). It can also be defined as those we grant full and equal moral status, i.e., whose needs, interests, or well-being we take into account in our deliberations (Warren, 1997). With respect to dentistry, someone who has equal moral status would be an equal participant in treatment decisions (Ozar, 1985). Naturally, people extend moral inclusion to those they are close to, such as family or friends, or social groups they identify with, such as people who share the same gender, race, class, profession, religion or nationality (called their “in-groups”) (Schwartz, 2007; Spohn, 1996). In contrast, moral exclusion is the exclusion of others from our boundaries of fairness. Moral inclusiveness describes the breadth of one’s moral community or extent of people we apply moral inclusion towards. People who apply moral values only to those they are close to are described as having a narrow moral community, and thus, a low level of moral inclusiveness. Those who apply moral values to people who are different than themselves (“out-groups”) are described as having a broad moral community, or a high level of moral inclusiveness (Morselli & Passini, 2012; Schwartz, 2007; Spohn, 1996).

Social psychology studies have shown a positive relationship between moral inclusiveness and altruistic behaviour towards marginalized groups (Crimston et al. 2016; Morselli & Passini, 2012; Schwartz, 2007). Schwartz (2007) found significant relationships between moral inclusiveness, measured by Likert-type questions on universalism values, and
favourable perceptions of immigration and participation in activities that benefit the wider society, such as donating to or volunteering in humanitarian organizations. Crimston et al. (2016), using the term “moral expansiveness” rather than moral inclusiveness, created a “Moral Expansiveness Scale” (MES). Respondents were asked to indicate their level of agreement for Likert-type scale questions about their moral concern and obligation towards several groups of people and entities, such as sentient and non-sentient beings. The sum of the responses yielded the MES. They found that those high in moral expansiveness were more likely to endorse universalism values and to base their moral judgments on considerations of the well-being of others and protecting them from harm.

While the Canadian Dental Association’s code of ethics (Canadian Dental Association, 2018) states that dentists must “practice in a just and equitable manner” and “[p]rovide care to, and promote the well-being of, all members of society” – principles which represent moral inclusion and moral inclusiveness – the literature suggests that some may not act accordingly, particularly with low-income populations. There are dentists who choose not to see poor patients altogether, and the ones that do “can signal the message, often inadvertently, that they would prefer not to have to treat such patients” (Burt and Ekland, 2005, p. 34). For example, dentists may direct their staff to re-book patients who have missed an appointment if they have private insurance, but are less willing to do the same for those who pay by public insurance (Lévesque et al., 2016). They may categorize poor patients into “deserving” and “non-deserving”, perpetuating stereotypes of the poor (Lévesque et al., 2015; Loignon et al., 2012). Dentists also tend to communicate and collaborate less on health care decisions with low-income patients (Verlinde et al., 2012; Willems et al., 2005). They may even discount procedures that are complex and/or expensive, giving reasons such as a lack of remuneration and patients’ lack of self-care (Bedos et al., 2013; Redford & Gift, 1997). They instead perform what Bedos et al.
(2013) call “dentistry for the poor”, emergency dentistry or very basic care. Double standards, biased evaluation of groups, and victim blaming represent processes of moral exclusion (Opotow, 1990). The danger is that even though these actions may be subtle, “[t]hose who habitually employ them can perceive some people as objects and imperceptibly cross a threshold that excludes these others from their moral [community]” (Opotow, 1990, p. 12).

Given the above, there is a paucity of studies on the relationship of health care professionals’ moral inclusiveness to altruistic behaviour. Grembowski et al. (1997), in their study of dentists’ clinical decision-making factors, considered the factor “information giving to patients”, which may represent moral inclusion. Patients in the study were given an initial oral assessment by calibrated hygienists. The research team then tracked insurance records for the next two years to quantify any treatment rendered by fee-for-service “private” dentists. They found there was a higher odds of undertreatment (as compared to the initial oral assessments) when the dentist had a strong belief in information giving to patients. McKernan et al.’s (2015) study explored the relationship between attitudes towards altruism, the Medicaid program and Medicaid patients and the odds of accepting Medicaid patients. Altruism was measured by Likert-type scale questions which represented moral inclusiveness, such as “Dentists have an ethical obligation to treat Medicaid patients”. In multivariable logistic regression, attitudes significantly predicted acceptance of Medicaid patients after controlling for demographic characteristics.

Importantly, the sociological literature has suggested that the breadth of one’s moral community can change contextually (Opotow, 1990; Schwartz, 2007). The dental literature has similarly found that market pressures may impact dentists’ views of their social responsibility (Dharamsi et al., 2007; Harris et al., 2014; Öcek & Vatansever, 2014). For example, the dentist-participants in Öcek and Vatansever’s (2014) qualitative study stated that the market
environment in dentistry forced them to adopt a business person perspective and prevented them from fulfilling the basic requirements of professionalism. Quiñonez et al. (2009) found that making a “business decision” to reduce the amount of public insurance in the dentist’s practice was a significant negative predictor of accepting new publicly insured patients. As Dharamsi et al. (2007) concluded in their qualitative study, when it came to dentists’ social responsibility, economics “was the bottom line against which other positions had to be justified” (p. 1585).

This paper will examine the relationship between perceived professional role, defined as the dentists’ belief that they are health care professionals versus business people, and moral inclusiveness. It is hypothesized that dentists who consider themselves health care professionals rather than business people will have a higher level of moral inclusiveness, as measured by the breadth of their moral communities. This exploratory study will also use multivariable logistic regression to find the predictors of high moral inclusiveness.

**Methods**

The Health Research Ethics Board at the University of Toronto approved the research (protocol reference #33949). The sampling frame was the 2016 Royal College of Dental Surgeons of Ontario register, which included all dentists who held a valid license to practice in Ontario, Canada’s most populated province. The inclusion criterion was a generalist license. Exclusion criteria were: a specialist license; dentists who worked in settings not subject to the dental care market, e.g. dental school faculty, public health unit, etc.; dentists not in Ontario; and dentists who participated in the pilot testing of the survey. This resulted in a sampling frame of 7,067 dentists.

We used the following equation to calculate our minimum sample size:

\[ n = \frac{(P)(1-P)}{(C/Z)^2} \]

where \( P \) is the proportion of the population expected to choose one of two
responses, C the assumed sample error, and Z the zed statistic of the confidence interval (Salant & Dillman, 1994). The following achieved a sample with a maximum variance and standard confidence interval of 95% +/- 3%: 

\[ n = \frac{(1.96)(0.5)}{(0.03)^2} = 1,067. \]

Due to the historically low response rates from dental professionals (Hardigan et al., 2012), this number was tripled. In 2017, using a random start, systematic sampling method, 3,201 dentists were chosen from the sampling frame and invited to participate in the study. Three mailings of the survey were sent; the first with an introductory letter and survey, and the remaining with a short reminder and survey. Reminder mailings were only sent to those who had not responded to prior mailings. The incentive for survey completion was entry into a draw for one free continuing education course offered by the Faculty of Dentistry, University of Toronto.

Survey Creation

The data for this study came from a larger study on the factors that may have a relationship to treatment decision-making. It employed a 46-item survey with questions on dentists’ demographic and practice characteristics. It also included questions on professional characteristics, such as opinions on professional responsibilities. The survey was pre-tested amongst a sample of University of Toronto teaching faculty for face and content validity before it was pilot tested with 20 general dentists for face validity and ease of completion.

Perceived professional role was measured by two methods. The first method was by visual analog scale. Along a 100mm line with the two ends labelled as “Health Care Professional” and “Business Person”, respondents were asked to place an ‘x’ where they perceived their role to be. The second method was a set of 5-point Likert-type scale questions that have been validated in the literature in terms of their ability to classify a respondent’s attitudes as that of a health care professional or a business person (Bebeau et al., 1993; Harris et
al., 2014; Krupat et al., 2000). The first five questions represented the morally inclusive attitudes of a health care professional (Table 11). The last four questions represented business practices in dentistry.

Dentists’ moral inclusiveness was measured by the breadth of their moral communities. Respondents were asked: “To which patient populations do you think you have a duty to care? Please state your level of agreement for each of the following groups.” This 5-point Likert-type scale question was posed for several social groups: population at-large; all patients in my practice; low-income children; low-income adults; low-income seniors; and adults on social assistance. To calculate the “moral community score”, we first assigned weights to the dentists’ ranking of their duty to care. “Not sure”, “Disagree”, and “Strongly disagree” were given a weight of ‘1’ to represent the lowest level of moral inclusiveness. “Agree” and “Strongly agree” were weighted as ‘2’ and ‘3’, to represent high and the highest levels of moral inclusiveness, respectively. Next, weights were applied to the social groups to represent dentists’ levels of moral inclusiveness. Dentists who worked with patients most different than themselves would be considered to have the highest level of moral inclusiveness. As “population at-large”, “low-income adults”, and “adults on social assistance” were the most different than dentists, these groups were given the highest weight of ‘3’. Further, Burt and Ekland (2005) have suggested that private dentists’ offices are composed mainly of patients similar in socio-economic status as themselves. Thus, “All patients in my practice” would be most similar to dentists and received a weight of ‘1’. Low-income children and low-income seniors received the intermediate weight of ‘2’ as the literature has suggested that dentists and society consider these groups as “deserving” of assistance (Quiñonez, 2009). Finally, for each of the six social groups, the dentists’ ranking of their duty to care was multiplied by the social group weight. The sum yielded the moral community score, with a minimum score of 14 and a maximum of 42. A higher score meant a
higher level of moral inclusiveness or a broader moral community. It is important to note that
this study did not have the intention to create and validate a scale to measure perceived
professional role or moral inclusiveness in dentists; rather, the objective was to do preliminary
research on the relationship between these two concepts.

**Statistical Methods**

In terms of analyses, univariate, bivariate and multivariable analysis was performed using
SPSS v. 23. Binary logistic regression was performed for variables which had significant
relationships (p < 0.1) to the outcome, breadth of moral community, in chi-square tests. Variables
that had significant relationships (p<0.05) in binary logistic regression were then entered as a
block into multivariable logistic regression to find the dominant predictors for the outcome.

Previous multivariable logistic regression analysis (Yu, Ghoneim, Lawrence, Glogauer,
& Quiñonez, 2018) has shown that demographic and practice characteristics were significant
predictors of a broad moral community. However, to test if the morally inclusive attitudes of
health care professionals predicted a broad moral community over demographic and practice
characteristics, we based our methodology on McKernan et al. (2015). We constructed two
multivariable logistic regression models. The first model included all demographic and practice
characteristics entered simultaneously as a block. In the second model, the average score of the
five health care professional questions (the first five questions in Table 11) was entered as a
second block. We then compared models by examining the Nagelkerke pseudo-R² index and the
Hosmer-Lemeshow test results.
Results

We received 1,075 usable surveys, giving a 33.6% response rate. The respondents’ demographic characteristics were compared to the membership records of the Ontario Dental Association (Table 10), a voluntary professional organization whose membership comprises 90% of dentists with a valid licence to practice in Ontario (ODA, 2018). Respondents were comparable in terms of gender, place of initial dental training and practice ownership, but not age or year of graduation; a greater proportion of older dentists responded to the survey.

Because the data were not normally distributed, the perceived professional role visual analog scale was dichotomized into “health care professional” (for those who marked an ‘x’ from 0 to 49 mm) and “business person” (for those who marked an ‘x’ from 51 to 100mm), coded as ‘0’ and ‘1’ respectively. We excluded respondents who indicated they were equally health care professional and business person (score of 50) as we aimed to find the characteristics which would differentiate the two roles. Using the visual analog scale, 92% of respondents identified as health care professionals and 8% as business people (n=925).

As the moral community score was also not normally distributed, it was dichotomized at the median to delineate the “narrow” and “broad” moral community groups, and coded as ‘0’ and ‘1’ respectively. Among 1,005 respondents, 42.5% and 57.5% of respondents had narrow and broad moral communities respectively. Of note was the maximum score of ‘42’, given by 23.8% of respondents. Further analysis was conducted to compare the demographic and practice characteristics of dentists who had the maximum score to the remaining respondents with lower scores. Bivariate analysis showed that there were generally no significant differences between the two groups. However, those who had the maximum score had a 39% greater odds (OR=1.39; 95% CI 1.01, 1.91, p=0.042) of having a greater percentage of patients pay by public insurance in their practices than those who had a lower moral community score.
Table 11 shows the responses to the Likert-type scale questions that measured perceived professional role. The majority of dentists agreed with both the morally inclusive attitudes of health care professionals and business practices in dentistry. The only exception was the final question, with 76.9% of respondents disagreeing with this statement: “Thinking about the financial implications for the practice when I advise patients of treatment options is important to me”. Further, the percentages of dentists who strongly agreed or agreed they had a duty to care for the listed social groups confirm dentists’ reluctance to treat patients on social assistance. The social groups’ percentages in descending order were: all patients in my practice 94.7%; low-income children 87.6%; population at-large 84.1%; low-income seniors 82.3%; low-income adults 75.8%; and adults on social assistance 68.9%.

Dentists who identified as health care professionals on the visual analog scale had a 38% greater odds (OR=1.38; 95% CI 0.85, 2.26, p=0.2) of having a broad moral community, but the relationship was not statistically significant. Also, for many of the Likert-type scale questions that measured perceived professional role, strongly agreeing or agreeing with the questions did not have a significant relationship to moral community breadth (Figure 3). However, there was a trend; strongly agreeing or agreeing with the health care professional questions was associated with a broad moral community. Except for the last question, strongly agreeing or agreeing with business person questions did not have a significant relationship to moral community breadth. In addition, we looked at the convergent validity of the two methods to measure perceived professional role (Figure 4). Though the bivariate analysis did not reveal many significant relationships, there again was a trend. Agreeing with the Likert-type scale questions representing a business person role was associated with a greater odds of reporting a business person role by visual analog scale. Except for the first question, agreeing with the Likert-type scale questions
representing a health care professional role was not significantly associated with a lower odds of reporting a business person role by visual analog scale.

In a previous multivariable logistic regression analysis which employed only block entry of demographic and practice variables, female gender and perceiving other dentists to be colleagues rather than competitors were found to be significant predictors of a broad moral community (Yu et al., 2018). In this study, after controlling for demographic and practice characteristics, we found that perceiving other dentists as colleagues rather than competitors and the average score of the health care professional questions representing moral inclusiveness predicted a broad moral community (Table 12). Gender had ceased to be a significant predictor, while perceiving other dentists as colleagues rather than competitors remained a significant one. It could be argued that the latter variable is also related to a morally inclusive attitude, as it could represent whether or not respondents consider other dentists to be in their moral community.

While the Nagelkerke pseudo-$R^2$ statistics showed that the second model had a higher predictive power than the first model, the second model still had a relatively low predictive power (Nagelkerke pseudo-$R^2 = 0.229$).

**Discussion**

Our study corroborates the literature that highlights the conflict between business considerations and dentists’ moral inclusiveness (Dharamsi et al., 2007; Harris et al., 2014; Öcek & Vatansever, 2014). Further, these findings may have implications for patient care. We found that agreeing or strongly agreeing with the question “It is important to understand a patient’s culture and background in order to treat a patient’s illness” was positively associated with a broad moral community (high moral inclusiveness) and negatively associated with a business person role. The literature has also suggested that a business orientation may be associated with
low moral inclusiveness. Walsh and Gordon (2010) posited that practitioners who follow a business-like model of professionalism would tend to interact as little as possible with patients to make transactions run more quickly and smoothly. Further, Lévesque et al. (2015) found that business-oriented dentists tended to distance themselves from their social assistance patients and instead employed biomedical models of care. Thus, a business orientation, accompanied by low moral inclusiveness, may be another potential source of tension between dentists and low-income patients, as the literature has shown that using a biomedical approach to care rather than a patient-centred one may have a negative impact on patient satisfaction and compliance (Haidet et al., 2002; Krupat et al., 2000).

Moreover, low moral inclusiveness has the potential to endanger dentistry’s status as a health care profession. It has been argued that physicians should only have a duty to care for their own patients and not society at-large (Arnett, 2002). However, Welie (2012) reminds us that dentists, like any other health care professionals, are under the social contract, and are granted professional status in exchange for looking after the well-being of all members of society. Exhibiting moral exclusion towards certain groups would constitute non-fulfillment of the profession’s side of the contract and may erode public trust.

Our finding that attitudinal factors may predict moral inclusiveness over demographic and practice characteristics suggests that dentists’ moral inclusiveness can be measured. A moral inclusiveness measure may aid the profession in gauging the willingness of its members to engage in proposed social policies. Issues of social justice, like lack of access to care and oral health inequalities, can only be tackled if the profession’s collective members believe moral inclusiveness to be an integral part of professionalism.

Furthermore, it has been argued that if the profession wishes to foster a culture of social responsibility amongst its members, dental schools may intentionally select for candidates who
express a sense of obligation towards marginalized groups (Dharamsi, 2006; O’Toole, 2006). However, current methods involving admissions interviews or other screening devices have had only limited success with predicting professionalism in practice (Bebeau & Monson, 2012). As such, we propose that a moral inclusiveness measure be used to monitor dental school students’ connectedness with patients and sense of social responsibility throughout the course of the program. Dental schools have the responsibility to teach students the social contract, and the importance of caring for all members of society. Using a measure of moral inclusiveness may help educators evaluate the effectiveness of school curricula on students’ professionalism and humanism.

**Strengths, Limitations, and Future Directions**

Our study’s strengths include an adequate sample size and representativeness of Ontario dentists (Canada’s largest cohort of dentists), except for age and year of graduation. Our limitations are the same as for other studies which use cross-sectional survey data; causation cannot be inferred, and there may be social desirability bias and non-response bias. In addition, because there were no previous scales to measure the moral inclusiveness of health care professionals, the development of the moral community score posed challenges of construct validity. However, as our results include significant relationships between exposure and outcome variables that support the literature and/or make inherent sense, this exploratory study may lay the preliminary groundwork for the development of a moral inclusiveness scale for health care professionals. Also, our study corroborates the literature on the relationship between business considerations and moral inclusiveness. In terms of future directions, analysis should be done to compare dentists who feel they are equally health care professionals and business people to ones who feel they are primarily health care professionals or business people.
Conclusions

Perceived professional role was found to have a relationship to moral inclusiveness. Having morally inclusive attitudes was positively associated with having a broad moral community and negatively associated with considering oneself a business person. In addition, morally inclusive attitudes predicted a broad moral community over demographic and practice characteristics. Our study further highlights the conflict between professional responsibilities and business concerns. This may have implications for public trust and dentistry’s status as a health care profession. Dentists are expected to act in their patients’ best interest and uphold health care professional values, even in the face of economic pressures. Overall, values like altruism and fairness can only be sustained if the overwhelming majority of dentists believe them to be integral to professionalism.
Table 10: Respondents’ Characteristics

<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>Categories</th>
<th>n</th>
<th>Survey sample</th>
<th>Ontario Dental Association members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>700</td>
<td>65.5%</td>
<td>62.0%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>369</td>
<td>34.5%</td>
<td>38.0%</td>
</tr>
<tr>
<td>Age</td>
<td>40 and younger</td>
<td>154</td>
<td>14.4%</td>
<td>29.0%</td>
</tr>
<tr>
<td></td>
<td>41 to 50</td>
<td>274</td>
<td>25.7%</td>
<td>25.0%</td>
</tr>
<tr>
<td></td>
<td>51 to 60</td>
<td>325</td>
<td>30.4%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>61 and older</td>
<td>315</td>
<td>29.5%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Year of graduation</td>
<td>Before 1970</td>
<td>35</td>
<td>3.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td></td>
<td>1970 - 1979</td>
<td>184</td>
<td>17.8%</td>
<td>11.0%</td>
</tr>
<tr>
<td></td>
<td>1980 - 1989</td>
<td>302</td>
<td>29.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td></td>
<td>1990 - 1999</td>
<td>296</td>
<td>28.7%</td>
<td>22.0%</td>
</tr>
<tr>
<td></td>
<td>2000 - 2009</td>
<td>160</td>
<td>15.5%</td>
<td>24.0%</td>
</tr>
<tr>
<td></td>
<td>2010 - 2016</td>
<td>55</td>
<td>5.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Place of initial dental training</td>
<td>Canadian dental school</td>
<td>806</td>
<td>75.4%</td>
<td>71.0%</td>
</tr>
<tr>
<td></td>
<td>American dental school</td>
<td>84</td>
<td>7.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td></td>
<td>International dental school</td>
<td>179</td>
<td>16.7%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Practice ownership</td>
<td>Owner/Partner</td>
<td>777</td>
<td>73.3%</td>
<td>66.0%</td>
</tr>
<tr>
<td></td>
<td>Associate</td>
<td>283</td>
<td>26.7%</td>
<td>34.0%</td>
</tr>
</tbody>
</table>
Table 11: Dentists’ Level of Agreement with Perceived Professional Role Questions
[questions adapted from Bebeau et al. (1993); Harris et al. (2014); Krupat et al. (2000)]

<table>
<thead>
<tr>
<th>Perceived professional role question</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly agree/agree</td>
</tr>
<tr>
<td>It is important to understand a patient’s culture and background in order to treat a patient’s illness. (n=1028) (Culture)</td>
<td>75.0</td>
</tr>
<tr>
<td>Patients should be treated as if they were partners with the dentist, equal in power and status. (n=1026) (Power)</td>
<td>71.0</td>
</tr>
<tr>
<td>That I provide an equally good standard of care whether working on publicly or privately insured patients is important to me. (n=1033) (Standard)</td>
<td>98.0</td>
</tr>
<tr>
<td>Reducing inequalities in oral health across the population is important to me. (n=1022) (Inequalities)</td>
<td>79.3</td>
</tr>
<tr>
<td>Dentists should lobby for dental benefits for the disadvantaged. (n=1020) (Lobby)</td>
<td>69.2</td>
</tr>
<tr>
<td>Identifying new business opportunities for the practice is important to me. (n=1022) (Opportunities)</td>
<td>62.0</td>
</tr>
<tr>
<td>Positioning the practice in the marketplace is important to me. (n=1024) (Marketplace)</td>
<td>65.3</td>
</tr>
<tr>
<td>Having remuneration in line with my years of training/skills is important to me. (n=1022) (Remuneration)</td>
<td>81.5</td>
</tr>
<tr>
<td>Thinking about the financial implications for the practice when I advise patients of treatment options is important to me. (n=1020) (Financial)</td>
<td>13.8</td>
</tr>
</tbody>
</table>

*may not add up to 100% due to rounding error
Figure 3: Relationships Between Strongly Agreeing or Agreeing with Professional Role Questions and a Broad Moral Community

Figure 4: Relationships Between Strongly Agreeing or Agreeing with Professional Role Questions and Identifying with a Business Person Role, by Visual Analog Scale
Table 12: Logistic Regression Analyses for the Predictors of a Broad Moral Community

<table>
<thead>
<tr>
<th></th>
<th>Bivariate (n=334)</th>
<th>Multivariable Model 1 (n=334)</th>
<th>Multivariable Model 2 (n=334)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio (95% CI)</td>
<td>P</td>
<td>Odds ratio (95% CI)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (reference)</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Female</td>
<td>1.429 (1.092, 1.869)</td>
<td>0.009</td>
<td>1.699 (1.015, 2.841)</td>
</tr>
<tr>
<td>Years of practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 10 years</td>
<td>1.563 (1.015, 2.407)</td>
<td>0.042</td>
<td>1.572 (0.786, 3.145)</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Perception of student loans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small (reference)</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Medium</td>
<td>1.665 (1.080, 2.566)</td>
<td>0.021</td>
<td>1.642 (0.948, 2.844)</td>
</tr>
<tr>
<td>Large</td>
<td>1.524 (0.974, 2.385)</td>
<td>0.065</td>
<td>1.261 (0.691, 2.302)</td>
</tr>
<tr>
<td>Number of patients per day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – 8 (reference)</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>9 or more</td>
<td>1.294 (1.006, 1.666)</td>
<td>0.045</td>
<td>1.236 (0.766, 1.995)</td>
</tr>
<tr>
<td>Satisfaction with practice busyness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very satisfied (reference)</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td>0.708 (0.518, 0.970)</td>
<td>0.031</td>
<td>0.819 (0.460, 1.459)</td>
</tr>
<tr>
<td>Somewhat dissatisfied</td>
<td>0.558 (0.382, 0.815)</td>
<td>0.003</td>
<td>1.271 (0.619, 2.608)</td>
</tr>
<tr>
<td>Very dissatisfied</td>
<td>0.845 (0.436, 1.635)</td>
<td>0.617</td>
<td>1.751 (0.31, 5.768)</td>
</tr>
<tr>
<td>Percentage of treatment procedures per week*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 59%</td>
<td>1.261 (0.977, 1.629)</td>
<td>0.075</td>
<td>-</td>
</tr>
<tr>
<td>60 – 100% (reference)</td>
<td>1.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Referral to other dentists score*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low referral rate (reference)</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------</td>
<td>---</td>
<td>-----</td>
</tr>
<tr>
<td>High referral rate</td>
<td>1.360 (1.032, 1.791)</td>
<td>0.029</td>
<td>1.200 (0.743, 1.939)</td>
</tr>
<tr>
<td>Perception of other dentists</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitor (reference)</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Colleague</td>
<td>1.578 (1.115, 2.232)</td>
<td>0.010</td>
<td>2.173 (1.186, 3.981)</td>
</tr>
<tr>
<td>Perceived pressure from other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dental practices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium/Large amount of</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>pressure (reference)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not feel pressure/Small</td>
<td>1.406 (1.081, 1.828)</td>
<td>0.011</td>
<td>1.108 (0.623, 1.968)</td>
</tr>
<tr>
<td>amount of pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of health care</td>
<td>4.428 (3.351, 5.851)</td>
<td>&lt;0.001</td>
<td>-</td>
</tr>
<tr>
<td>professional questions (continuous)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagelkerke Pseudo-(R^2)</td>
<td>-</td>
<td>-</td>
<td>0.089</td>
</tr>
<tr>
<td>Hosmer-Lemeshow test</td>
<td>-</td>
<td>-</td>
<td>0.836</td>
</tr>
</tbody>
</table>

* continuous variable that was dichotomized at the median due to the lack of a normal distribution
7 General Discussion

This thesis has added to the literature on the multifactorial nature of clinical decision-making, namely treatment intensity. We have found that dentists’ beliefs and attitudes about professionalism – specifically, their perceived professional roles and moral inclusiveness – have significant relationships to treatment intensity. These findings have regulatory, professional and educational implications.

For regulatory implications, our findings may inform regulatory boards of the non-clinical factors which may influence treatment decisions and of members’ opinions on access to care issues. The latter is particularly important if the profession and other stakeholders seek to increase access to dental care for marginalized populations. Further, our findings may give regulatory boards a glimpse into the general treatment aggressiveness of their members. Based on the scores from ten case scenarios, we found that the median score was 20 and the 90th percentile score was 25 (with a minimum score of 10 and maximum score of 40), both of which fell in the conservative treatment range. We may interpret these findings in two ways. The first is that Ontario dentists as a whole are conservative in their treatment decisions. The second is that the responses may reflect social desirability bias, as we intuitively know that not all dentists are conservative. Whatever the reason, the fact that we have found that differences in dentists’ beliefs in their professional roles and moral inclusiveness were associated with differences in treatment intensity scores may be problematic.

If it were found that dentists were using criteria other than patients’ health conditions and preferences to make treatment decisions, then this may have professional implications, particularly for public trust and dentistry’s status as a health care profession. Professional codes state that dentists must act for the benefit of the patient and society (CDA, 2018). Further,
dentists, under the social contract, are explicitly granted professional status by society in exchange for looking after the public’s well-being, as well as assuring competence through self-regulation (Cruess & Cruess, 2008; Welie, 2012). Thus, dentists acting non-altruistically and the profession failing to regulate its members would constitute non-fulfillment of the profession’s side of the social contract.

Welie (2004a, 2004b, 2004c) states that the roles of health care professional and business person are irreconcilable, as the former acts in the patients’ best interest and the latter acts in self-interest. Other researchers have explored how the two roles can co-exist (Harris et al., 2014; Harris & Holt, 2013; Holden, 2018a). For example, it has been argued that both professionalism and commercialism are premised on a good public reputation. In addition, for patients to have continuous care, a practice must be run sustainably. Also, as most dental treatments are seen as discretionary by patients (with the exceptions being emergencies such as trauma, uncontrolled bleeding, pain that is unmanageable with analgesics and spreading infection), dentists must understand patients’ consumer-like behaviour (such as shopping around or negotiating prices) and meet patients’ wants (Holden, 2018a). In our study, we found that participants generally agreed with both health care professional values and the arguably necessary nature of business practices in dentistry. This may indicate a general shift in dentists’ nature vis-à-vis professionalism. Though the respondents in our study may have had conflicts with the market approach to dentistry, the majority have acknowledged it as a necessity for their practices to survive, or may even have internalized a business ethos.

In Harris and Holt’s qualitative (2013) study, dentist-participants reconciled the business aspects of their practice with their professional duties by showing reflexivity in care, rather than using purely clinical conditions to determine patient treatment. The participants asserted that the feelings of their patients carried weight; they talked through options with patients, being aware
of care from the patient’s perspective; and they offered services that patients desired, such as orthodontics and cosmetic dentistry. However, in the second paper from this study, the researchers stated that the same participants had less expression of an ethical obligation to society at large when resources were tight (Harris et al., 2014). They instead placed a higher priority on relationships with the patients in their practice and the immediate community, as these relationships would ensure practice survival. While the authors of the study have posited that the roles of health care professional and business person are not completely contradictory, the above findings show that market pressures may contribute to dentists limiting their moral community boundaries, favouring their patients, or “in-group”. Thus, we may argue that our study corroborates this study and others (Dharamsi et al., 2007; Lévesque et al., 2015; Öcek & Vatansever, 2014) which have shown the negative relationship between business considerations and moral inclusiveness.

Given the above, our study suggests that a business ethos, accompanied by low moral inclusiveness, may have negative implications for patient care, public trust and dentistry’s status as a health care profession. This leads us to the educational implications of our study. To counter a market mentality, two methods have been discussed in the literature. The first method, proposed in the medical literature, is to change the way doctors are paid for their services (Chaix-Couturier, Durand-Zaleski, Jolly, & Durieux, 2000; Eisenberg, 1985). It has been argued that fee-for-service remuneration often encourages procedures and penalizes the cognitive and interpersonal aspects of practice (Carmel & Glick, 1996). Also, the lack of remuneration for the extra time required to explain, counsel, comfort, and educate low-income patients and their families discourages health care professionals from treating marginalized groups (Pellegrino, 1999). However, it has been noted that financial incentives cannot be the sole tool for public health and professional policies as they do not change the motivation of practitioners (Chaix-
Couturier et al., 2000). For example, studies have shown that only increasing Medicaid reimbursement rates, without any other measures, was not always sufficient to improve dentists’ rates of participation in Medicaid or access to dental care in some American states (Borchgrevink, Snyder, & Gehshan, 2008).

The second proposed method to counter a market mentality is to instill health care professional values in practitioners. Dentists must be reminded of the social contract and the professional responsibilities they have towards their patients and the public at large. Rule and Welie have framed this concept as the need to promote a “culture of connectedness” in dentists (Rule, 2010; Rule & Welie 2009; Welie & Rule 2006). They have argued that dentists who are not connected with their patients may not understand the necessity of partnership with patients in the dentist-patient relationship, and may fail to recognize patients’ needs or concerns. Dentists who are not connected with other practitioners may perceive them to be competitors, and act in ways to “get ahead”. Further, dentists who are not connected with their profession may not understand the importance of upholding ethical codes of conduct and act in self-interest instead. Finally, dentists who are not connected with society at large may not understand its role in the sanctioning of professions, and neglect their responsibilities for the well-being of the public (Rule, 2010).

However, instilling connectedness in practitioners may prove to be challenging. For example, Asimakopoulou, Gupta and Scambler’s (2014) qualitative study found that dentist-participants did not practice patient-centredness due to reasons like overly or less keen patients and lack of time. The researchers concluded that the participants felt any failure to practice patient-centred care was due to an external or ‘other’-related problem rather than a dentist problem.
What is more, dentists’ reluctance to treat low-income populations is further perpetuated by the clashes between dentists’ and patients’ views on cultural behaviour and expectations (Gehshan, Hauck, & Scales, 2001). For example, in Bedos et al.’s (2013) qualitative study, dentist-participants complained of the rate of “no-shows” from patients on social assistance. “No-shows” represented a sign of disrespect for the dentists, and reinforced their negative perceptions about people on social assistance, as dentists assumed that their “no-shows” were due to lack of motivation or laziness. This highlights dentists’ misunderstandings of poverty; studies have found that many dentists believe poverty to be a product of individual choices, rather than external reasons, like unfavourable life circumstances or social context (Lévesque et al., 2015, 2016; Loignon et al., 2012). Combatting institutionalized views on poverty requires the conscious effort of dentists to understand underprivileged groups (Lévesque et al., 2016). A pilot course from McGill University on humanism and the social determinants of health has shown modest changes in attitudes toward low-income groups, though it did have the unintended consequence of reinforcing some participants’ negative views (Lévesque et al. 2016).

Given the difficulty with altering practicing dentists’ attitudes and behaviour, there has been a renewed focus on the teaching of professionalism to dental students (Masella, 2007). Using a combination of formal and informal curricula, educators have emphasized the importance of understanding the social contract, the foundation of the dental profession (Holden, 2018b; Masella, 2007; Rule & Welie, 2006). With regards to the effectiveness of formal curricula in the acquisition of ethical and professional values by students, Bebeau (1991) cites studies which have shown the following: the mental capacity to engage in relatively sophisticated moral reasoning generally does not develop until the late teens and early twenties, the age at which most people enter dental school; educational instruction to influence moral reasoning and judgment processes are effective; and moral perception and moral judgment are
related to actual real-life behaviour. Bebeau cautions that while ethics instruction cannot produce dramatic changes in people, it may teach people the methodology for making ethical decisions and give them the opportunity to practice their ethical problem-solving skills. With practice, people may improve their ability to make ethical decisions.

Other researchers have suggested that role modelling and the “hidden curriculum” may be used to teach professionalism to students (Hafferty & Franks, 1994). The hidden curriculum consists of the day-to-day interactions among students and faculty (Hafferty & Franks, 1994). However, this method requires a strong commitment from school leaders to act as role models themselves and to recruit faculty who prioritize professional values and who can articulate the reasons for their good behaviour (Ssebunnya, 2013).

Further, studies have shown that attitudes towards treating marginalized populations may be shaped by educational and professional experiences such as service learning and community-based clinical experiences (Kuthy, Heller, Riniker, McQuistan, & Qian, 2007; Yoder, 2006). In a study by Dharamsi et al. (2010), the researchers noted that while students had positive attitudes towards community-service learning experiences, they mentioned barriers that would likely prevent them from contributing to community-based volunteer activities in the future. Barriers included (with the percentage of respondents): time limitations (71%), debt incurred from education (67%), and financial obligations (57%). This suggests the need to find ways of relieving students’ financial burden, though our study had the unexpected finding that dentists who perceived their student loans to be medium or large, compared to small, had an increased odds of having a broad moral community. Rivkin-Fish (2011) also found that community-based education may fail to motivate dental students to serve the poor if it doesn’t educate new practitioners about the lives of poor people and the causal relationships between poverty and poor health.
In addition, it has been argued that if the profession wishes to foster a culture of social responsibility amongst its members, dental schools may intentionally select for candidates who express a sense of obligation towards marginalized groups (Dharamsi, 2006; O’Toole, 2006). However, current methods involving admissions interviews or other screening devices have had only limited success with predicting professionalism in practice (Bebeau & Monson, 2012). As such, we propose that a moral inclusiveness measure be used to monitor dental school students’ connectedness with patients and sense of social responsibility throughout the course of the program. We may then get a greater sense of the effect that school curricula have on students’ professionalism and humanism. Indeed, studies have suggested that students’ empathy, defined as the ability to understand a patient’s experiences and feelings and the capability to communicate this understanding, declines throughout the course of dental school (Sherman & Cramer, 2005).

With regards to dental school admissions, schools may select students from ethnic minority backgrounds and the lower and middle class, as studies have shown that the intention to treat the poor is associated with belonging to a minority group or being from the lower or middle class (Sherman & Cramer, 2005; Wear & Kuczewski, 2008). The current overrepresentation in the profession of dentists from affluent social classes may reinforce the lack of knowledge and negative attitudes concerning poverty and the poor (Dharamsi, 2006; Loignon et al., 2012).

Overall, dentists must understand the collective nature of the profession (Rule, 2010). Society’s trust in professionals is not vested in the individual service providers but in the profession at large (Ozar & Sokol, 2002). It follows that every dentist must act morally to maintain the public’s trust. Also, altruism is a “shared” competency; altruistic dentists would find it very difficult to continue caring for low-income patients if many of their peers did not take on their “fair share” (Welie & Rule, 2006). Finally, if the profession wishes to tackle social
justice issues such as lack of access to care and oral health inequalities, its members must mutually agree that values like fairness and altruism are integral to the profession, and then promote them as so. As members of a high-power group, dentists must understand the inequitable distributions of privilege and disadvantage within their society, and see how their individual actions may contribute to societal problems (Opotow et al., 2005).

8 Strengths, Limitations, and Future Directions

Our study’s strengths include an adequate sample size and representativeness of Ontario dentists (Canada’s largest cohort of dentists), except for age and year of graduation. Also, to our knowledge, we have conducted the first empirical studies on the relationships of perceived professional role and moral inclusiveness to treatment intensity.

Our limitations are the same as for other studies which use cross-sectional survey data; causation cannot be inferred, and there may be social desirability bias, non-response bias and recall error. In addition, there may have been issues with the construct validity of our measures. Rather than behavioural observation, we employed case scenarios to measure treatment intensity and Likert-type scale questions to measure perceived professional role and moral inclusiveness. While some have argued that survey data may provide the basis for constructing patterns of association between attitudinal variables and reported practice (Calnan, Silvester, Manley, & Taylor-Gooby, 2000), others argue that the relationships between behavioural intention and actual chair-side behaviour are often moderate (Harris et al., 2014). A more rigorous test would be one taken over time (Harris et al., 2014). Also, there were respondents who noted in their returned surveys that the case scenarios did not contain an option on patients’ preferences. For
these dentists, patient preferences took precedence over other considerations during treatment planning, and they may have been displaying moral inclusion.

It is important to note that these exploratory studies did not have the objective to create and validate a measure of moral inclusiveness. However, the Cronbach’s alpha for the five health care professional questions which represented morally inclusive values was found to be 0.63. Though it did not reach the recommended level of 0.7, our Cronbach’s alpha may still be considered a reasonable level of internal consistency, given this set of questions aimed to measure a broad construct with a small number of items (Spiliotopoulou, 2009). Schwartz (2007) also reported a Cronbach’s alpha of less than 0.7 with his measures, giving similar reasoning. As Cronbach’s alpha is known to increase with the number of items in the scale, it has been suggested that we cannot always divide outcome measures as reliable or unreliable based on rigid benchmarks (i.e., the 0.70 benchmark) (Voss et al., 2000).

For future directions, further analysis of our data may include the comparison of dentists who feel they are equally health care professionals and business people to ones who feel they are primarily health care professionals or business people. Studies in pharmacy have found attitudinal differences between pharmacists who consider themselves health care professionals, business people and “dualists” (both health care professional and business person) (Jacobs, Ashcroft, & Hassell, 2011; Kronus, 1975). We may also refine our measures of treatment intensity and moral inclusiveness to address issues of social desirability bias. In addition, we may investigate what other factors may have a relationship to the breadth of a dentist’s moral community. The sociology literature has suggested that one’s moral community may be impacted by factors such as an individual’s beliefs on fairness, resource scarcity, the prevailing social order, and the existence of conflict between groups (Crosby & Lubin, 1990; Opotow, 1990; Reed & Aquino, 2003; Schwartz, 2007).
In terms of the broad vision of how this research may be used, it may provide the preliminary groundwork for measuring moral inclusiveness in other health care professions. We may argue that moral inclusiveness is an integral part of professionalism, as professional codes of conduct dictate that practitioners act for the benefit of all of society, and concern for other groups is a prerequisite for tackling issues like population health inequalities. Overall, we must understand our biases and attitudes towards other groups before we can learn to humanize and help others.

9 Conclusions

We have found that dentists’ beliefs and attitudes about professionalism – specifically, their perceived professional roles and moral inclusiveness – have significant relationships to the aggressiveness of treatment decisions. We have also found a business orientation to be correlated with low moral inclusiveness. This may be problematic, as dentists are expected to base treatment decisions on their patients’ health conditions and needs rather than non-clinical factors. Professional codes of conduct state that dentists must act in their patients’ best interest and not in their self-interest. Further, dentists, under the social contract, are explicitly granted professional status by society in exchange for looking after the public’s well-being. While business considerations are inevitably a part of dentistry, dentists must be reminded of the social contract and their responsibilities towards not only their patients but the public at large. The challenge is to nurture in dentists a “willingness to go beyond the isolation of interpreting one’s professional role in order to be connected to the concerns of other individuals and to the overall well-being of society” (Hershey, 1994, p.33).
References


Appendix A: Ethics Approval

PROTOCOL REFERENCE # 33949

February 21, 2017
Dr. Carlos R. Quinonez Dr. Bonnie Yu
FACULTY OF DENTISTRY FACULTY OF DENTISTRY

Dear Dr. Quinonez and Dr. Bonnie Yu,

Re: Your research protocol entitled, "Dentists' clinical decision-making, moral communities and perceived professional roles"

ETHICS APPROVAL Original Approval Date: February 21, 2017
Expiry Date: February 20, 2018
Continuing Review Level: 1

We are writing to advise you that the Health Sciences Research Ethics Board (REB) has granted approval to the above-named research protocol under the REB's delegated review process. Your protocol has been approved for a period of one year and ongoing research under this protocol must be renewed prior to the expiry date.

Any changes to the approved protocol or consent materials must be reviewed and approved through the amendment process prior to its implementation. Any adverse or unanticipated events in the research should be reported to the Research Oversight and Compliance Office Human Research Ethics Program as soon as possible.

Please ensure that you submit an Ethics Renewal Form or a Study Completion/Closure Report 15 to 30 days prior to the expiry date of your current ethics approval. Note that ethics renewals for studies cannot be accepted more than 30 days prior to the date of expiry.

If your research is funded by a third party, please contact the assigned Research Funding Officer in Research Services to ensure that your funds are released.

Please note, all approved research studies are eligible for a routine Post-Approval Review (PAR) site visit. If chosen, you will receive a notification letter from our office. For information on PAR, please see

Best wishes for the successful completion of your research.

Yours sincerely,

Elizabeth Peter, Ph.D.
REB Chair

Research Oversight and Compliance Office - Human Research Ethics Program
McMurrich Building, 12 Queen's Park Crescent West, 2nd Floor, Toronto, ON M5S 1S8 Canada
Tel: +1 416 946-3273 Fax: +1 416 946-5763 ethics.review@utoronto.ca http://www.research.utoronto.ca/for-researchers-administrators/ethics/
Appendix B: Canadian Dental Association Principles of Ethics

**TRUST**
Trust is the cornerstone of the dentist-patient relationship and the contract between the dental profession and society.

**Honesty**
Be truthful; behave in a trustworthy manner by furthering the patient's well-being and acting with moral concern to achieve a good outcome.

**Competence**
Be competent; provide treatment in accordance with your level of clinical expertise, within currently accepted professional standards and evidence-based practice, and keep your knowledge and skills of dentistry contemporary.

**Fairness**
Be fair; treat all individuals, patients, and colleagues fairly, and practice in a just and equitable manner.

**Accountability**
Be accountable; take responsibility for your actions, decisions, judgment and professional competence and act, first and foremost, for the benefit of, and in service to, the health of patients and the community.

**HEALTH**
Achieving health is the primary objective of dentistry.

**Respect for autonomy**
Respect the patient's right to choose; patients have the right to be fully informed and make choices for, and actively participate in, their care and pursue their personal values, beliefs and goals in achieving their optimal oral health.

**Duty to care**
Provide care to, and promote the well-being of, all members of society; promote fair and reasonable access to quality oral health care without prejudice or discrimination, always regarding the patient as worthy of treatment.

**Prevention**
Prevent disease by encouraging healthful behaviour in individuals and society; promote health by addressing the broader contexts in which disease occurs.
Appendix C: Survey Question Sources

<table>
<thead>
<tr>
<th>Factor</th>
<th>Conceptual model category</th>
<th>Exposure/Outcome</th>
<th>Literature Source</th>
<th>Methodological notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Provider (dentist) characteristic</td>
<td>Exposure</td>
<td>“The role of dentist, practice and patient factors in the provision of dental services”. Brennan &amp; Spencer (2005) found a significant negative association for male dentists with preventive services. “The Feminization of Dentistry: Implications for the Profession”. McKay &amp; Quiñonez’s (2012) literature review found that gender may reflect a different perspective when deciding on treatment. Female dentists have been reported to make decisions based more on personal values and maintenance of harmony. Male dentists are found to base their decisions more on logical thinking and objectivity. Other studies also confirmed the treatment differences based on gender. It was found that female dentists favour a more preventive philosophy, take a more conservative approach to restoration and encourage more preventive strategies in the early stages of caries. Male dentists, however, would choose to intervene more often in the case of enamel lesions in low-risk patients. “Restorative Treatment Thresholds for Proximal Caries in Dental PBRN”. Kakudate et al. (2012) also concluded that gender difference functioned in the variation of the decision to restore enamel lesions. Male dentists have higher tendency to intervene surgically in enamel lesions in comparison to female dentists. We hypothesize that the treatment variation based on gender is reproducible among dentists practicing in Ontario.</td>
<td></td>
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</tbody>
</table>
“Thresholds of Restorative Decision in Dental Caries, Treatment among Dentists from Small Brazilian Cities”. Traebert, Wesoloski, Telino de Lacerda, & Marcenes (2007) found that gender was not a factor in interventionist attitude (restoring caries in enamel, at the DEJ, or at outer dentine).

“Dentists’ perspectives on caries-related treatment decisions”. Gomez, Ellwood, Martignon, & Pretty (2014) found that among Colombian dentists, influences of gender were not important in treatment decisions.

<table>
<thead>
<tr>
<th>Age</th>
<th>Provider characteristic</th>
<th>Exposure</th>
<th>“Factors influencing the appropriateness of restorative dental treatment: an epidemiologic perspective”. Grembowski et al. (1997) found that overtreatment was prevalent across different age groups of dentists. However, it was stated that the rationale behind the overtreatment was suggested to be different.</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td></td>
<td>“Thresholds of Restorative Decision in Dental Caries, treatment among Dentists from Small Brazilian Cities”. Traebert et al. (2007) stated that age was not a factor in interventionist attitude (restoring caries in enamel, at the DEJ, or at outer dentine)</td>
</tr>
<tr>
<td>Place of initial training</td>
<td>Provider characteristic</td>
<td>Exposure</td>
<td>“Variations in a restorative treatment decision: an international comparison”. Kay and Locker (1996) found Canadian dentists had a greater propensity to restore caries overall and at each lesion depth than Scottish dentists - study findings in agreement with other international findings.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“Changes in the Treatment Concept for Approximal Caries from 1983 to 2009 in Norway”. Vidnes-Kopperud, Tveit, &amp; Espelid (2011) found that only 7% of Norwegian dentists would treat approximal caries operatively before the lesion reached dentine.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“Clinical Decision Making in Restorative Dentistry, Endodontics, and Antibiotic Prescription”. Zadik and Levin (2008) found that in a sample of dentists from Israel, Eastern Europe, and Latin America, dentists differed in their practicing habits and decision-making.</td>
</tr>
</tbody>
</table>

Variability in clinical decisions across different countries is ubiquitous.
“Restorative Treatment Thresholds for Proximal Caries in Dental PBRN”. Kakudate et al. (2012) found that Japanese dentists were at high risk of restoring caries lesions in enamel.

“Restorative Treatment Strategies Reported by French University Teachers”. Tubert-Jeannin, Doméjean-Orliaguet, Riordan, Espelid, & Tveit (2004) found that French dental school teachers’ attitudes differed from those of private practitioners: they tended to intervene surgically at a later stage, but they would intervene earlier in the treatment of the carious process than would Scandinavian dentists.

Overall, Scandinavian dentists seemed to be the most preventive oriented compared to their international peers.

<table>
<thead>
<tr>
<th>Year of graduation</th>
<th>Provider characteristic</th>
<th>Exposure</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>“Restorative material and other tooth-specific variables associated with the decision to repair or replace defective restorations: Findings from The Dental PBRN”. Gordan et al. (2012) found that the less time since graduation from dental school, the higher the probability that the dentist does repairs instead of replacing of restorations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years of practice</th>
<th>Provider characteristic</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>“Brazilian Dentists’ Restorative Treatment Decisions”. Traebert et al. (2005) found that those who had graduated less than 10 years ago were less interventionist.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Clinical Decision Making in Restorative Dentistry, Endodontics, and Antibiotic Prescription”. Zadik and Levin (2007) suggested that general practitioners with less than 10 years after graduation were more likely to overmedicate (antibiotics) and over treat (caries).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Are clinical decisions in endodontics influenced by the patient’s fee-paying status?” Walker, Gilbert, &amp; Asimakopoulou (2015) suggested that experienced dentists in the UK may be practicing in entirely an ethical way and not driven by a financial gain.</td>
</tr>
</tbody>
</table>

We hypothesize that the year of graduation and the number of years in practice will have a significant impact on the outcome results.
Clear evidence was presented through those articles to support the hypothesis that seniority in the dental profession plays a role in the outcome of the treatment.

<table>
<thead>
<tr>
<th>Provider characteristic</th>
<th>Exposure/Outcome</th>
<th>Exposure</th>
<th>Exposure/Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of practice in Canada</td>
<td>“Comparing the treatment provided by UK and non-UK trained health professionals: dentists in Scotland”. Wang, Chalkley, &amp; Tilley (2012) found non-UK trained dentists initially provided more treatment than UK-trained dentists, but over two years of practice their treatment converged. The study revealed dentists who were trained outside the UK chose different clinical decisions than the ones who were trained in the UK. However, those decisions differences became insignificant after practicing in the UK for 2 years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hours worked</td>
<td>“The effect of education debt on dentists’ career decisions”. Nicholson et al. (2015) concluded that recent dental graduates (dentists who graduated 7 years ago or less) were more likely to work more hours.</td>
<td>“Repair or replacement of defective restorations by dentists in The Dental PBRN”. Gordan et al. (2012) suggested that dentists from large group practices were more likely to repair than to replace defective restorations than dentists in small or solo practices.</td>
<td>We hypothesize that dentists who feel the financial pressure may tend to work longer hours compared to their peers.</td>
</tr>
<tr>
<td>Number of dentists</td>
<td>“Factors Influencing the Appropriateness of Restorative Dental Treatment: and Epidemiologic Perspective”. Grembowski et al. (1997) found that solo dentists were more likely to overtreat than those in group practices. “Dental Decisionmaking and variation in dentist service rates”. Grembowski, Milgrom and Fiset (1991) found practice size explained variation in treatment decisions</td>
<td>“Repair or replacement of defective restorations by dentists in The Dental PBRN”. Gordan et al. (2012) suggested that dentists from large group practices were more likely to repair than to replace defective restorations than dentists in small or solo practices.</td>
<td>Despite the research done in regards to this factor, it remains vague how the number of dentists available at the office may influence the clinical decision making.</td>
</tr>
</tbody>
</table>
“Differences between reported and actual restored caries lesion depths: Results from The Dental PBRN”. Rindal et al. (2012) found that large group practices had a higher rate of discordance between reported and actual restored caries lesion depths.

| Employment status | Provider characteristic | Exposure | Antecedent | Anecdotal, dentists who are owners (compared to associates) will more likely take the financial aspects of the clinic into consideration when making treatment decisions.
|-------------------|-------------------------|----------|------------|--------------------------------------------------|
| Age of the practice | Practice characteristic | Exposure | “Factors Influencing Variation in Dentist Service Rates”. Grembowski et al. (1990) suggested that age of the practice may have an influence on the treatments provided to patients.  
“Dental decisionmaking and variation in dentist service rates”. Grembowski et al. (1991) found practice age explained variation in treatment decisions |
<p>| Perception of practice loans | Provider characteristic | Exposure | See the study loan section below. | The financial situation of the dentist and clinical decision making had shown to be associated in the literature. This association may be stronger in the |</p>
<table>
<thead>
<tr>
<th>Number of hygienists</th>
<th>Practice characteristic</th>
<th>Exposure</th>
<th>“Factors Influencing Variation in Dentist Service Rates”. Grembowski et al.’s (1990) study states that larger practices characterized by having a higher number of dental hygienists rendered more preventive and periodontic treatments than the smaller practices employing fewer hygienists.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of hygienist hours</td>
<td>Provider characteristic</td>
<td>Exposure</td>
<td>The presence of more hygienists in a practice may indicate its orientation towards preventive measures.</td>
</tr>
<tr>
<td>Study loans</td>
<td>Provider characteristic</td>
<td>Exposure</td>
<td>“The effect of education debt on dentists’ career decisions”. In Nicholson et al. (2015), it was found that higher initial educational debt was not associated with the choice of employment setting (entering private practice, accepting high-paying jobs on graduation, and working longer hours), practice ownership, and whether to provide Medicaid and charity care while dentists’ sexes and races were. The significant hike in the cost of dental school fees has put a massive burden on the fresh graduates shoulder. This pressure is likely to reflect on their clinical decisions.</td>
</tr>
<tr>
<td>Perception of study loans</td>
<td>Provider characteristic</td>
<td>Exposure</td>
<td>“Debt and Practice Profiles of Beginning Dental Practitioners”. Chambers, Budenz, Fredekind, &amp; Nadershahi (2002) found that for beginning practitioners, there was no association between educational debt and propensity to engage in unconventional procedures (procedures that other respondents did not routinely perform). In fact, larger debt discouraged or delayed practice ownership. “The Burden of Debt for Canadian Dental Students: Part 4. The Influence of Debt on Program and Career Decisions”. Walton, Matthew, Dumaresq, &amp; Sudmant (2006) concluded that debt influenced the choices of recent dental graduates as well as students contemplating to start their dental career.</td>
</tr>
<tr>
<td>Number of patients seen/day</td>
<td>Provider characteristic</td>
<td>Exposure/Outcome</td>
<td>Anecdotally, practicing dentists who are owners have increased motivation to see more patients.</td>
</tr>
</tbody>
</table>
Dentists who have full schedules may make different clinical decisions than those who do not have full schedules.

<table>
<thead>
<tr>
<th>Gross billing/day</th>
<th>Provider characteristic</th>
<th>Outcome</th>
<th>Owners (as compared to associates) may feel pressure to charge higher amounts to cover practice expenses.</th>
</tr>
</thead>
</table>

Perception of the level of busyness | Provider characteristic | Outcome | “Restorative Treatment Thresholds for Proximal Caries in Dental PBRN”. Kakudate et al.’s (2012) study showed that the decision to restore caries lesions had many variables that demonstrated significance. However, according to this study, the busyness of the dental office did not show a significant difference in the variation of clinical decision making of dentists. “Dental decisionmaking and variation in dentist service rates”. Grembowski et al. (1991) found practice busyness explained variation in treatment decisions. “Factors Influencing the Appropriateness of Restorative Dental Treatment: and Epidemiologic Perspective”. Grembowski et al. (1997) found that dentists were more likely to undertreat if they had a busy practice. The relationship between perception of busyness and decision-making by dentists is prominent and well demonstrated in most of Grembowski et al.’s studies. As a result of the competitive nature of the dental practices in the Canadian market nowadays, the perception of busyness will have an effect on dentists’ clinical decisions. |

<p>| Procedure time | Provider characteristic | Outcome | Although not being studied in the literature, we |</p>
<table>
<thead>
<tr>
<th>Breakdown/week</th>
<th>Provider characteristic</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical technologies used</strong></td>
<td>Provider characteristic</td>
<td>“Factors Influencing Variation in Dentist Service Rates”. Grembowski et al. (1990) hypothesized that older dentists would provide a lower number of services and lower number of new technologies in the market. The awareness of dental technologies by dental professionals may be correlated to the number of services offered to the patients and therefore can be an indirect factor affecting the clinical decision-making. Dentists who choose to invest in the most recent technologies may feel pressured to utilize them regardless of the actual need.</td>
</tr>
<tr>
<td><strong>Referrals</strong></td>
<td>Provider characteristic</td>
<td>We hypothesize that financially oriented dentists will tend to refer out less patients.</td>
</tr>
<tr>
<td><strong>Continuing education courses attended</strong></td>
<td>Provider characteristic</td>
<td>“Factors That Drive Dentists towards or Away from Dental Caries Preventive Measures: Systematic Review and Metasummary”. Suga et al. (2014) suggested that education and training have a direct effect on the dentist’s provision and motivation towards preventive services. It was also stated that low or no remuneration for preventive services may reduce dentist’s willingness to provide them. Newer procedures and techniques taught through continuing education courses tend to be less invasive and more preventive in nature. Exploring this factor may identify the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Factors Influencing the Appropriateness of Restorative Dental Treatment: and Epidemiologic Perspective”. Grembowski et al. (1997) found that dentists who had less continuing education were more likely to overtreat.</td>
</tr>
</tbody>
</table>
| Perception of competition | Provider characteristic | Exposure | “Brazilian Dentists’ Restorative Treatment Decisions”. Traebert et al. (2005)

“Thresholds of Restorative Decision in Dental Caries, treatment among Dentists from Small Brazilian Cities”. Traebert et al. (2007) found that dentists who attended postgraduate courses were less interventionist (less likely to restore caries in enamel, at the DEJ, or at outer dentine).

| Amount needed to bill to become profitable | Provider characteristic | Outcome | “Competition and Financially Related Misconduct in Dental Practice: A Retrospective Descriptive Study”. Yuen & Quiñonez's (2015) correlated dentist density (Number of dentists per FSA) with financially related misconduct as a proxy to measure the perception of competition. It was hypothesized that the perception of competition may adversely influence clinical decision-making.

“Does Fluoridation Reduce the Use of Dental Services Among Adults?” Grembowski, Fiset, Milgrom, Conrad, & Spadafora (1997) hypothesized that in a fluoridated market with a large supply of dentists, overtreatment may reflect providers’ response to less tooth decay and increased competition for patients. They found that Seattle, a fluoridated city which also had the highest concentration of dentists in the state, had the most restorative demand.

| Primary income earner | Provider characteristic | Exposure | We hypothesize that the higher amount needed to become profitable, the more aggressive and financially oriented the dentists will be.

|  |  |  | Though studies have not explicitly used income as an
<table>
<thead>
<tr>
<th>Number of dependents</th>
<th>Provider characteristic</th>
<th>Exposure</th>
<th>independent variable, it can be inferred that when someone is the primary income earner in the household and is constantly struggling to make ends meet, these circumstances may influence their clinical treatment decisions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>Provider characteristic</td>
<td></td>
<td></td>
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</tbody>
</table>
## Appendix D: Perceived Professional Role Question Sources

<table>
<thead>
<tr>
<th>Question</th>
<th>Literature source and notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>42.a)</strong> It is important to understand a patient’s culture and background in order to treat a patient’s illness.</td>
<td>Krupat et al. (2000), from the Patient-Practitioner Orientation Scale (PPOS), caring subscale, worded in reverse</td>
</tr>
<tr>
<td><strong>42.b)</strong> Patients should be treated as if they were partners with the dentist, equal in power and status.</td>
<td>Krupat et al. (2000), from Patient-Practitioner Orientation Scale (PPOS), sharing subscale</td>
</tr>
<tr>
<td><strong>42.c)</strong> That I provide an equally good standard of care whether working on publicly or privately insured patients is important to me.</td>
<td>Harris et al. (2014) – duty to staff and patients domain, factor loading 0.359</td>
</tr>
<tr>
<td><strong>42.d)</strong> Reducing inequalities in oral health across the population is important to me.</td>
<td>Harris et al. (2014) – duty to staff and patients domain, factor loading 0.567</td>
</tr>
<tr>
<td><strong>42.e)</strong> Dentists should lobby for dental benefits for the disadvantaged.</td>
<td>Bebeau et al. (1993) – responsibility domain, factor loading 0.586 in Swisher et al. (2004)</td>
</tr>
<tr>
<td><strong>43.a)</strong> Identifying new business opportunities for the practice is important to me.</td>
<td>Harris et al. (2014) – entrepreneurial commercialism domain, factor loading 0.867</td>
</tr>
<tr>
<td><strong>43.b)</strong> Positioning the practice in the marketplace is important to me.</td>
<td>Harris et al. (2014) – entrepreneurial commercialism domain, factor loading 0.772</td>
</tr>
<tr>
<td><strong>43.c)</strong> Having remuneration in line with my years of training/skills is important to me.</td>
<td>Harris et al. (2014) – entrepreneurial commercialism domain, factor loading 0.341</td>
</tr>
<tr>
<td><strong>43.d)</strong> Thinking about the financial implications for the practice when I advise patients of treatment options is important to me.</td>
<td>Harris et al. (2014) – entrepreneurial commercialism domain, factor loading 0.316</td>
</tr>
</tbody>
</table>
Appendix E: Survey Instrument

This survey will consist of a mixture of questions about yourself, your dental office(s), and your practice of clinical dentistry via case scenarios.

First, some questions about yourself.

1. You are?
   - Male
   - Female

2. What is your age?
   - Less than 31
   - 31 to 40
   - 41 to 50
   - 51 to 60
   - 61 and older

3. Where did you receive your initial dental training?
   - Canadian dental school
   - American dental school
   - International dental school

4. What year did you graduate from your initial dental training? ________

5. Considering all jurisdictions, how many years have you been in practice?
   - 0-5 years
   - 6-10 years
   - More than 10

6. If you are American or internationally trained, how many years have you been practicing in Canada?
   - 0-5 years
   - 6-10 years
   - More than 10
Now some case scenarios.

Please read the following case scenarios and select the answer that is **closest** to what you would do for each patient.

7. A 20-year-old male patient presents to your clinic for a regular check-up. Today’s radiographs and clinical examination show he has impacted 18 and 28 and fully erupted 38 and 48. He mentions he has had slight discomfort on 38 in the past. How would you proceed?

- Advise on the importance of extracting third molars because they will be harder to extract as he gets older.
- Take a “wait-and-see” approach.
- Extract 38, and refer him to an oral surgeon to extract 18, 28.
- Extract 38, 48 and monitor 18, 28.

8. The images below refer to a 25-year-old female patient with a history of depression and poor oral hygiene. She presents to your clinic complaining of dry mouth. At what caries lesion depth do you think it would be best to do a permanent restoration instead of trying a preventive therapy? Please circle one answer.

9. A 27-year-old male patient presents to your clinic. He has not gone to a dentist in five years and requests an exam and completion of any necessary treatment. You find he has good oral hygiene, a slight catch on the occlusal amalgam of 37, a sticky pit on the occlusal of 36 and dark stains along the margins of an amalgam on 35. How would you proceed?

- Restore 37, monitor 36, 35.
- Restore 36, 37, monitor 35.
- Restore 37, 36, 35.
- Restore 36, monitor 35, 37.
10. A 35-year-old female patient presents to your clinic. She is new to your practice, having recently moved to the city. She has a non-contributory medical history and fair oral hygiene. She tells you that at her last dentist visit two years ago, the dentist performed a complete examination and radiographs. She asks you how often she should have a complete examination and radiographs? What is your response?

- I perform complete examinations every year and radiographs whenever indicated.
- I perform complete examinations every year and radiographs every two years.
- I will do a complete examination for your initial visit and will only take radiographs if needed.
- I will need to do a complete examination and radiographs every year.

**Now some questions about your clinical practice:**

11. On average, how many hours a week do you currently work in clinical practice?

- Less than 20 hours
- 20-35 hours
- 35-50 hours
- More than 50 hours

12. On a per chair basis, how much do you feel you have to bill per hour to be profitable?

- Less than $100
- $100 - 200
- $200 - 300
- $300 - 400
- $400 - 500
- $500 - 600
- $600 - 700
- $700 - 800
- $800 - 900
- $900 - 1000
- Greater than $1000

13. What percentage of your patients are covered by:

*(Percentages should add up to 100%.)*

<table>
<thead>
<tr>
<th>Coverage Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private insurance</td>
<td></td>
</tr>
<tr>
<td>Public insurance</td>
<td></td>
</tr>
<tr>
<td>Out-of-pocket</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>
14. Considering your primary practice, how many dentists are in the practice, including yourself?

- 1
- 2-4
- 5 or more

15. Which describes your current employment status?
(Please check all that apply.)

- Sole owner
- Partner
- Associate

If you picked **Sole owner** or **Partner** in question 15, please answer the following questions. **If not**, please go to question 22.

16. How many practices do you own/partner in? _________

17. What percentage of time do you spend in each of your practices? (Percentages should add up to 100%.)

<table>
<thead>
<tr>
<th>Practice Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary practice you are an owner/partner</td>
<td>%</td>
</tr>
<tr>
<td>Secondary practice you are an owner/partner</td>
<td>%</td>
</tr>
<tr>
<td>Tertiary practice you are an owner/partner</td>
<td>%</td>
</tr>
<tr>
<td>Remaining practices you are an owner/partner</td>
<td>%</td>
</tr>
<tr>
<td>Practices you are an associate</td>
<td>%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

18. Considering your current situation, do you feel your practice loans are:

- Small
- Medium
- Large
- I do not have outstanding loans
Please answer the following questions for your primary practice.

19. How old is your practice?

- [ ] 0 to 5 years
- [ ] 6 to 10 years
- [ ] > 10 years

20. How many hygienists do you employ?

- [ ] 0
- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5 or more

21. How many total hours a week does the hygienist work?
(If you have more than one hygienist, please total their hours.)

- [ ] Less than 20 hours
- [ ] 20-35 hours
- [ ] 35-50 hours
- [ ] More than 50 hours

Now more case scenarios. Please select one answer for each scenario.

22. A 25-year-old female reporter on a local TV channel presents to your clinic for her regular check-up. She has a non-contributory medical history and good oral hygiene. She has discoloured 11 and 21 facial composite restorations and extrinsic stains on her maxillary anterior teeth. She states, “I hate those stains, they make me look ugly.” How would you proceed?

- [ ] Recommend in-office whitening and then replace the old composites with new fillings.
- [ ] Recommend full-coverage porcelain crowns on the anterior teeth.
- [ ] Recommend porcelain veneers on the maxillary anteriors.
- [ ] Recommend porcelain veneers on maxillary and mandibular anteriors.
23. A 10-year-old patient presents to your clinic for a check-up. He has no medical conditions and good oral hygiene. The exam reveals sticky pits on 54 O, 64 O, 36 O and 46 O. What treatment would you recommend?

- Place sealants on 54, 64, 36, 46.
- Monitor 54, 64, and place sealants on 36, 46.
- Place restorations on 54, 64, 36, 46.
- Place sealants on 54, 64, and restorations on 36, 46.

24. A 48-year-old male present to your clinic. He hasn’t been to a dentist in six years, and his chief complaint is having sensitivity when biting on 36. He has a non-contributory medical history and good oral hygiene. You find that teeth 15, 26 and 36 are chipped. In 15 and 26, this involves only the enamel, and on 36, this involves the dentine. The patient mentions he may have a clenching habit. What do you do next?

- Restore 15, 26, 36, and fabricate a night guard.
- Restore 15, 26, place a crown on 36, and fabricate a night guard.
- Monitor 15, 26, restore 36, and fabricate a night guard.
- Place crowns on 15, 26, 36 and fabricate a night guard.

**Now some questions about your student loans:**

25. Did you have any student loans?

- Yes
- No

**If you answered No,** please go to question 28.

26. How long did it take to pay off your student loans?

- Less than 1 year
- 1 to 5 years
- 5-10 years
- More than 10 years
- My student loans are not yet paid off
27. Do you feel your student loans are/were:

- [ ] Small
- [ ] Medium
- [ ] Large

Please read the following case scenarios and select one answer for each.

28. A 50-year-old male patient comes to your clinic for a check-up. The patient has a non-contributory medical history. His radiographs reveal a periapical radiolucency on the 46, which is an abutment for a 3-unit bridge from 44 to 46. The patient reports no pain and never having a problem concerning this site. How would you proceed?

- [ ] Remove the bridge, perform endodontic treatment on 46, and place a new bridge.
- [ ] Monitor the periapical lesion and advise the patient to come back for recalls.
- [ ] Remove the bridge, perform endodontic treatment on 46, place crowns on 46, 44, and a 45 implant.
- [ ] Perform endodontic treatment on 46 through the crown.

29. A 65-year-old female patient has 2mm of gingival recession on teeth 34 and 35, with moderate abrasion on teeth 24 and 25. She also has stained and sticky surfaces on the exposed buccal roots of 34 and 35. She takes medications that contribute to mild xerostomia. She demonstrates good manual dexterity and good oral hygiene. What would you recommend for this patient?

- [ ] Place her on a 3-month recall and apply fluoride varnish at every visit.
- [ ] Restore 34, 35, place her on a 3-month recall and apply fluoride varnish at every visit.
- [ ] Restore 24, 25, 34, 35, place her on a 3-month recall and apply fluoride varnish at every visit.
- [ ] Restore 34, 35, place her on a 6-month recall and refer her to a periodontist for gingival grafts on the exposed root surfaces.
30. An 8-year-old female patient presents to your clinic. Upon clinical examination, you find she has a normal tooth eruption pattern, excellent oral hygiene and no caries. What is your recommended treatment plan and recall frequency for this patient?

- Do a complete exam, prophy, give fluoride, and advise a 9-month recall.
- Do a complete exam, take radiographs, perform scaling, give fluoride, and advise a 9-month recall.
- Do a complete exam, take radiographs, perform scaling, prophy, give fluoride, and advise a 6-month recall.
- Do a complete exam, perform scaling, give fluoride, and advise a 6-month recall.

**Now some questions about your clinical work.**

31. Not including hygiene checks, how many patients do you see on an average day?

- Less than 5
- 5 - 7
- 7 - 9
- 9 - 11
- 11 - 13
- More than 13

32. On an average day, what would you estimate your **personal** gross billings to be?

- Less than $1000
- $1000 - 1500
- $1500 - 2000
- $2000 - 2500
- $2500 - 3000
- $3000 - 3500
- $3500 - 4000
- $4000 - 4500
- $4500 - 5000
- $5000 - 5500
- $5500 - 6000
- $6000 - 6500
- $6500 - 7000
- $7000 - 7500
- $7500 - 8000
- $8000 - 8500
- $8500 - 9000
- $9000 - 9500
- $9500 - 10,000
- More than $10,000
33. Are you satisfied with the level of busyness in your practice?

- Very satisfied
- Somewhat satisfied
- Not sure
- Somewhat dissatisfied
- Very dissatisfied

34. During a typical work week, what percentage of your time is devoted to each of the following procedures? (Percentages should add up to 100%.)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic and preventive (exam, x-rays, scaling, prophylaxis, sealants, fluoride, etc.)</td>
<td>%</td>
</tr>
<tr>
<td>Restorative (fillings)</td>
<td>%</td>
</tr>
<tr>
<td>Crowns (tooth-supported and implant-supported)</td>
<td>%</td>
</tr>
<tr>
<td>Extractions</td>
<td>%</td>
</tr>
<tr>
<td>Implant surgery</td>
<td>%</td>
</tr>
<tr>
<td>Orthodontics (including Invisalign)</td>
<td>%</td>
</tr>
<tr>
<td>Cosmetic Dentistry</td>
<td>%</td>
</tr>
<tr>
<td>Full-mouth reconstruction</td>
<td>%</td>
</tr>
<tr>
<td>Other:</td>
<td>%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

35. What type of clinical technologies do you use in your practice? (Please check all that apply.)

- Cone Beam Computed Tomography (CBCT)
- Panoramic radiographs
- Cephalometric radiographs
- Fluorescence visualization devices (e.g. Velscope)
- Cerec machine (CAD/CAM)
- Laser periodontal debridement devices (e.g. Periowave)
- Caries detection devices (e.g. VistaProof, Canary)
- Other: ____________________________
36. How often do you refer patients to other practitioners for the categories listed below?  
*(Check one response for each item.)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Always</th>
</tr>
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<tbody>
<tr>
<td>Periodontics</td>
<td></td>
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<tr>
<td>Complex periodontics</td>
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<td></td>
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<td></td>
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<tr>
<td>Prosthodontics - fixed</td>
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<td></td>
<td></td>
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<tr>
<td>Prosthodontics - removable</td>
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<tr>
<td>Endodontics</td>
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<td></td>
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<tr>
<td>Complex endodontics</td>
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<tr>
<td>Extractions</td>
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</tr>
<tr>
<td>Complex extractions</td>
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<tr>
<td>Orthodontics</td>
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<tr>
<td>Medically compromised</td>
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<td></td>
</tr>
<tr>
<td>Behaviour management</td>
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</tbody>
</table>

37. For the past two years, please check the **three subject areas** where you took the most continuing education:

- Practice management
- Oral medicine/pathology
- Infection control
- Radiology
- Medical emergencies
- Treatment planning
- Paediatric dentistry
- Malpractice
- TMD
- Implants
- Periodontics
- Orthodontics
- Restorative/cosmetic dentistry
- Endodontics
- Removable prosthodontics
- Anaesthesia
- Fixed prosthodontics
- Oral surgery
- Other: ___________________
38. Dentists have various roles, such as being a health care professional and a business person. In terms of the relative balance between the two roles, please place an ‘X’ on the line below to describe where you perceive yourself to be.

[Blank line]

Health Care Professional

Business Person

39. Do you perceive other dentists as colleagues or competitors? Please place an ‘X’ on the line below to describe your relationship.

[Blank line]

Colleague

Competitor

40. How would you rate the amount of pressure you feel from competition from other dental practices?

- [ ] Small amount
- [ ] Medium amount
- [ ] Large amount
- [ ] I do not feel pressure from other dental practices.

Now we would like to hear your perspective on some issues regarding the profession and the dentist-patient relationship:

41. To which patient populations do you think you have a duty to care? Please state your level of agreement for each of the following groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population at large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All patients in my practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-income children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-income adults</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-income seniors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults on social assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
42. Please make one selection for each statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to understand a patient’s culture and background in order to treat a patient’s illness.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients should be treated as if they were partners with the dentist, equal in power and status.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>That I provide an equally good standard of care whether working on publicly or privately insured patients is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reducing inequalities in oral health across the population is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentists should lobby for dental benefits for the disadvantaged.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Now some statements about your dental practice.

43. Please make one selection for each statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying new business opportunities for the practice is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positioning the practice in the marketplace is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having remuneration in line with my years of training/skills is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thinking about the financial implications for the practice when I advise patients of treatment options is important to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Finally, some questions about you and your family:

44. Are you the primary income earner in your household?
   - Yes
   - No
   - Me and my partner contribute equally
   - Prefer not to say

45. How many dependents do you have (people you support financially)?
   - 0
   - 1
   - 2-4
   - 5 or more

46. Approximately, what is your personal after tax income?
   - Less than $100,000/year
   - $100,000 – 150,000/year
   - $150,000 – 200,000/year
   - $200,000 – 250,000/year
   - $250,000 – 300,000/year
   - $300,000 – 350,000/year
   - $350,000 – 400,000/year
   - $400,000 – 450,000/year
   - $450,000 – 500,000/year
   - $500,000 – 550,000/year
   - $550,000 – 600,000/year
   - $600,000 – 650,000/year
   - $650,000 – 700,000/year
   - $700,000 – 750,000/year
   - $750,000 – 800,000/year
   - More than $800,000/year
   - Prefer not to say

If you have any other comments you would like to add, please use the space below.

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
Appendix F: Invitation Letter

Dear Doctor,

We are inviting you to participate in a study investigating the dynamics of the dental care market in Ontario. From practice ownership, busyness and clinical decision-making, to the number of hours worked, competition, and practice philosophy. The study is being conducted at the Faculty of Dentistry, University of Toronto. We expect that the information gathered will be helpful to policy makers and educators. There are no significant risks in participating, and your participation is completely voluntary.

This invitation is being sent to a random sample of general dentists in Ontario, and the questionnaire will take approximately 20 minutes to complete. Your answers will be confidential. Only members of the research team (see below) will have access to the data. The questionnaire has an identification number so that we may check your name off our mailing list when we receive your survey and to ensure confidentiality during data analysis. Completed surveys will be retained in a locked filing cabinet in a secure room at the Faculty of Dentistry for seven years as per record keeping protocol.

By completing the survey, you are automatically entered into a lottery to win one free Category 1 Core continuing education course from utooth.ca, the University of Toronto’s online oral health teaching hub.

Again, your participation is strictly voluntary. There is no penalty if you choose not to participate or answer specific questions. You are welcome to contact us at the addresses below if you have questions about the study or the Research Oversight and Compliance Office - Human Research Ethics Program at 416-946-3273 or ethics.review@utoronto.ca.

Access to the results of this study will be available to the dental community via scholarly journals once it has undergone the peer-review process. Please be advised that the Human Research Ethics Program may access study-related data and/or consent materials for quality assurance, and to help ensure participant protection procedures are followed at all times. Also, please note that you can withdraw from the study, but given that your responses will ultimately be anonymized during data extraction and analysis, there will come a point when withdrawal will no longer be possible. If you do wish to withdraw from the study, please notify us as soon as possible by calling or emailing at the information below.

If you wish to participate in the study, please complete and return the questionnaire in the enclosed, postage-paid envelope. Your cooperation is greatly appreciated, and we thank you in advance for your time and help on this important project.

The Research Team:

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Dr. Bonnie Yu
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Dr. Carlos Quiñonez
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416-979-4908 Ext. 4491
Appendix G: Reminder Letter

Dear Doctor,

About a month ago, we wrote to you seeking your participation in a study of the dental care market. As of today, we have not received your questionnaire. If you have already mailed the questionnaire, please disregard this letter.

If you have not completed the questionnaire, please consider participating in our study. The information from this study may be helpful to policy makers and may lead to improvements in the education of dentists. By completing the survey, you are automatically entered into a lottery to win one free Category 1 Core continuing education course from uooth.ca, the University of Toronto’s online oral health teaching hub.

If you wish to participate in the study, please complete and return the questionnaire in the enclosed, postage-paid envelope. Thank you for your help!

If you have questions about the survey, please contact us:

The Research Team:

Dr. Abdulrahman Ghoneim
abdulrahman.ghoneim@mail.utoronto.ca
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Dr. Carlos Quiñonez
carlos.quinonez@utoronto.ca
Telephone: 416-979-4908 Ext. 4491
Appendix H: Final Reminder Letter

UNIVERSITY OF TORONTO
FAculty of dentistry

Dear Doctor,

About two months ago, we wrote to you seeking your participation in a study of the dental care market. As of today, we have not received your questionnaire. If you have already mailed the questionnaire, please disregard this letter.

By completing the survey, you are automatically entered into a lottery to win one free Category 1 Core continuing education course from utooth.ca, the University of Toronto’s online oral health teaching hub.

If you wish to participate in the study, please complete and return the questionnaire in the enclosed, postage-paid envelope. Thank you for your help!

If you have questions about the survey, please contact us:

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