

Development and Validation of the Dentists' Values Scale

by

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ABSTRACT

Development and Validation of the Dentists' Values Scale

by Angela D. Langille

During the yearly dental school admissions process, decision makers focus on determining which applicants will become competent practitioners. As such, the admissions procedure may benefit from including a reliable, valid tool that can assist in predicting the degree to which applicants are likely to become successful students and practitioners. One factor that is related to success in the dental profession is values. (Values are encompassed by the concept of professionalism, which is deemed a crucial element of dental success; Chamberlain, Catano, & Cunningham, 2005). However, systematic research on the values of dentists is lacking. Therefore, we developed a measure of dentists' values and validated it using a sample of Canadian dentists. Exploratory factor analysis results indicated 5 factors: Altruism, Personal Satisfaction, Conscientiousness, Quality of Life, and Professional Status. Confirmatory factor analysis indicated the 5-factor model was a good fit. We also administered the measure to dental students to determine the relationship between dentist and student values. For the values of Altruism and Professional Status, t-tests suggested that there were no differences between the two groups.

September 18, 2008.

CONSTRUCTION AND VALIDATION OF THE DENTISTS' VALUES SCALE

During the yearly dental school admissions process, decision makers are focused on determining which applicants will most likely become competent dental practitioners. Such admission decisions are made after considering applicants' results on a variety of factors including undergraduate grades, the Dental Aptitude Test, the new Canadian Dental Association (CDA) structured interview, and personality measures. Each of these factors has been shown to be a valid predictor of student performance in dental school. For instance, the Dental Aptitude Test predicts academic performance in the first two years of dental school (Dworkin, 1979; Kramer, 1986; Oudshoorn, 2003; Poole, Catano, & Cunningham, 2007; Smithers, Catano, & Cunningham, 2004; Thompson, Ahlawat, & Buie, 1979), the new CDA structured interview predicts clinical performance in years three and four of dental school (Poole et al., 2007), undergraduate grades predict first year academic performance (Sandow, Jones, Peeh, Courts, & Watson, 2002), and personality traits predict performance in all years or in part of the dental program, depending on the specific trait under consideration (Chamberlain et al., 2005; Poole et al., 2007; Smithers et al., 2004).

Although a considerable number of studies have focused on predicting grades of dental students, there is a lack of research related to admissions criteria that could be used to address post-graduate dentistry issues. Particularly, as suggested by Ranney, Wilson, and Bennett (2005), there is a gap in research directed at current challenges in the dental profession such as access to dentistry for disadvantaged groups, ethics and professionalism, filling academic positions, and conducting research. Thus, the purpose of the current research is to address the above-mentioned gap in research relating to post-graduation issues in the dental profession.

Professionalism and Values

Of the above-mentioned areas in which research is deficient, professionalism is of particular importance for success as a dentist (Chamberlain et al., 2005). Broadly, professionalism refers to “the conduct, aims, or qualities that characterize or mark a profession or a professional person” (“Merriam-Webster's Online Dictionary,” 2005). Although the exact definition of professionalism in health-related occupations has not been clarified (Chamberlain et al., 2005; Arnold, 2002), a common factor indicated in the literature is values, which are principles individuals use to guide their behaviour (Schwartz, 1994). For example, Epstein and Hundert (2002) stated that in addition to clinical skills and scientific knowledge, professional competence requires moral development. Furthermore, Arnold’s (2002) review of definitions demonstrated that several medical organizations agree that values are an important element of professionalism. Chamberlain’s (2003) review of professionalism in medicine and dentistry reached similar conclusions. Overall, professionalism definitions appear to include common values-related factors such as altruism, accountability, excellence, duty, self-assessment, communication, maturity, respect for others, reliability, honesty, and integrity (Chamberlain et al., 2005).

In addition to including values as a significant element of professionalism, Arnold (2002) emphasized the importance of measuring specific values-related elements of professional behaviour such as altruism, duty and service, empathy, and ethical decision-making. Arnold also commented that previous research has assessed such aspects of professionalism with values measures, but these measures were not necessarily related to medicine. Thus, it is important that future research assess specific elements of professionalism with medicine-specific instruments (Arnold 2002). Similar to the medical

profession, values have been measured in dentistry with instruments that were not specific to the dental profession. Therefore, a measure of values specific to dentistry would likely enhance the profession's ability to evaluate aspects of professionalism that are linked to values.

Broadly, Schwartz (1994) defines values as principles that guide one's behaviour. Similarly, in a dental context, values have been referred to as "orientations toward groups of activities seen as rewarding" (Chambers, 2001, p.1433). As mentioned above, the notion of collecting values data in the dental profession is not new. In fact, Cain, Silberman, Mahan, & Meydrech (1983) emphasized the importance of collecting values and personality data from students before their admittance to dental school. Cain et al. (1983) also advised that values information could be used to enhance dental student development, so that students become well integrated both personally and professionally. Loupe, Meskin, and Mast (1979a) also recommended that values information be collected during the admissions process because, ultimately, it could be used to influence the values of practicing dentists. The current research addresses the above-mentioned gap in professionalism-related research by creating a reliable, valid tool that assesses values related to the dental profession. Because this measure may assess information not included in existing admissions criteria, it may enhance the dental school admissions procedure as well as aid in development of professional behaviour in students after their admittance.

Values Measurement in the Medical Profession

In the medical profession, past research has considered values, largely in relation to career choices of medical students. For instance, using the Allport-Vernon-Lindsay SOV, Hojat et al. (1998) assessed medical students' values and their relationships to

students' salary expectations and their and career specialties 25 years later. They found that doctors in people-oriented specialties scored higher on Social values than doctors in technology-oriented specialties. Hojat et al. (1998) also found that high income expectations of students were positively related to scores on Economic values and negatively related to scores on Religious and Social values.

Leong, Hardin, and Gaylor (2005) also assessed values of medical students with the Values Scale (Nevill & Super, 1986), which assesses 21 intrinsic (e.g., Autonomy) and extrinsic (E.g., Economic Rewards) work values. Results of this research indicated a positive relationship between interest in family medicine and scores on the value of Physical Activity. Furthermore, for women, there was a negative relationship between interest in family medicine and scores on the value of Economic Rewards. For men, there was a negative relationship between interest in family medicine and the values of Autonomy and Social Interactions.

In addition to using pre-existing scales to measure values, researchers have created medicine-specific values. Hartung, Taber, and Richard (2005) constructed and validated a 6-factor medicine-specific values measure and, similar to Hojat et al. (1998), found that medical students' values might be related to their career-specialty choice. For instance, for participants who had decided on a specialty, those interested in non-primary care scored higher on Prestige and Scholarly Pursuits values scales than those interested in primary care. Participants who were undecided about their area of specialty also scored higher on Scholarly Pursuits than those interested in primary care.

Murdoch, Kressin, Fortier, Giuffre, and Oswald (2001) also developed and validated a medical-specific values scale. Specifically, they created a 7-factor instrument to assess career-related values of medical students. Results of this research demonstrated

a positive relationship between scores on the Bioscientific Orientation values scale and interest in radiology or surgery specialties, and a negative relationship for interest in primary care. Furthermore, scores on the Biosocial Orientation and Avoid Role Strain scales were positively related to interest in primary care and negatively related to interest in radiology or surgery.

Previous values-related research has made comparisons between values of medical and dental students. For instance, Crossley and Murbank (2002) developed a 6-dimension scale to assess students' values, which they defined as motivations toward career choice. Research findings indicated that dental students (versus medical students) were more motivated by Status and Nature of the Occupation, and less motivated by Career Opportunities, Patient Care and Working with People, Use of Personal Skills, and Interest in Science. Crossley and Murbank's (2002) findings suggest that dental students might be motivated by different values than medical students. Thus, measures that are related to health-care may provide valuable information about values related to dentistry. However, because dental students or dentists might hold unique values, these measures could exclude important information that is relevant to dentistry but not relevant to other healthcare professions.

Values Measurement in the Dental Profession

Of studies that focused on dentists' values, several assessed values with the 6-factor Allport-Vernon-Lindzey Study of Values (SOV). Studies using the Allport-Vernon-Lindzey SOV have yielded conflicting results. Specifically, in terms of Aesthetic values, Silberman (1976a; 1976b) and Manhold, Shatin, and Manhold (1963) found that dental students scored high, whereas Heist (1960) and Cain, Silberman, Mahan, and Meydrech (1983) found they scored low. For Theoretical values, research of Silberman,

Heist, and Cain et al. found that dental students scored high, but Manhold et al. found that students scored low. Also, for Economic values, Silberman and Cain et al. found that dental students scored average to low. Heist and McDaniel, Siler, and Isenberg, however, found that students scored high on Economic values. In terms of Social values, Silberman found that dental students scored average to high and Heist found they scored low. Finally, for Political values, Silberman found that students scored average and Cain et al. and McDaniel et al. found that students scored high.

As the above discussion has illustrated, dental-related research using the Allport-Vernon-Lindzey SOV has found that dental students obtained high and low scores on most of the scale's factors. These findings might be due to particular sample characteristics, such as participants' geographical location or year of dental school. Nonetheless, a clear picture of dental students' values cannot be formed with this group of studies.

In addition to the Allport-Vernon-Lindzey SOV, researchers have used other scales to measure values related to the dental profession. For instance, Becker, Kaldenberg, and Connor (1996) measured values of dental practitioners with the Rokeach Values Survey (RVS). The RVS measures 18 terminal values (desirable conditions such as having wisdom, equality, or salvation) and 18 instrumental values (desirable modes of conduct such as behaving in a way that is honest, capable, or loving).

Using the RVS, Becker et al. (1996) detected that in terms of terminal values, dentists valued Family Security, Self-respect, Happiness, Freedom, Inner Harmony, Mature Love, and Pleasure, but did not value a World of Beauty, Social Recognition, a World at Peace, Salvation, or National Security. In terms of instrumental values, dentists scored high on the values of being Honest, Responsible, Ambitious, Capable,

Independent, Logical, and Intellectual, but scored low on the values of being Polite, Imaginative, Obedient, Forgiving, Broad-minded, and Clean. However, reviewers of the RVS contend that it is extremely outdated (e.g., asks questions about Dr. Martin Luther King and Vietnam) and due to its mediocre reliability, should not be used to make important decisions about those it evaluates (Brookhart & Sanford, 1995).

The 6-factor Survey of Interpersonal Values has also been used to assess values of dental students. Specifically, Loupe et al. (1979b) found that dental students scored high on the values of Support, Independence, and Benevolence, and low on the value of Leadership.

At least one attempt has been made to develop a values measure specific to dental students in an educational environment. Casada, Willis, and Butters (1998) created a measure of 12 values and found that dental students valued passing licensure exams, completing course requirements, and personal satisfaction. However, because the authors did not discuss processes of construction or validation, this scale might not be suitable for wide scale assessment of values in the dental profession.

As illustrated by the previous discussion, values are an important element of professional behaviour in dentistry and other healthcare professions. However, systematic research is lacking. Specifically, past research of values in the dental profession has used a mix of generic or non-specific work values measures (i.e., measures not specific to the dental profession) or has demonstrated inconsistent results (Chambers, 2001).

Furthermore, studies related to values in dentistry are not numerous, and the majority of studies were conducted from 20 to almost 50 years ago. Therefore, in the current research, a new measure of values specific to the dental profession was developed.

Schwartz's Theory and Proposed Scale Structure

Schwartz's (1994; Schwartz & Boehnke, 2004) theory of values forms the theoretical foundation for the new Dentists' Values Scale (DVS). According to this theory, personal values are grouped according to the types of motivational goals they express. In total, there are 10 classifications of values, each representing its own motivational goal: Power, Achievement, Hedonism, Stimulation, Self-direction, Universalism, Benevolence, Tradition, Conformity, and Security (see Table 1 for definitions).

Schwartz's theory has been tested with at least 200 samples and has been used in over 60 countries (Roccas, Sagiv, Schwartz, & Knafo, 2002). Therefore, during scale construction of the DVS (described in the methods section of this paper), scale items were grouped according to Schwartz's value types. Since no items of the DVS corresponded to Schwartz's Stimulation values, the DVS is comprised of the remaining 9 factors. Because the DVS values are grouped according to Schwartz's (1994) theory, scores on the DVS should correlate to scores on the Schwartz Value Scale for similar value types.

Values and Personality

Past researchers have considered the relationship between values and the Five Factor Model of personality (FFM), commonly known as the Big Five. The FFM assumes that there are five main factors of personality: Extraversion (degree of interpersonal interaction), Conscientiousness (organization and purposefulness), Neuroticism (degree of negative affect), Openness to Experience (seeking and appreciating new experiences), and Agreeableness (degree to which individual is compassionate or antagonistic; Costa & McCrae, 1992).

Table 1

Schwartz's types of values defined.

Type	Definition
Power	Social status and prestige, control or dominance over people and resources
Achievement	Personal success through demonstrating competence according to social standards
Hedonism	Pleasure and sensuous gratification for oneself
Stimulation	Excitement, novelty, and challenge in life
Self-direction	Independent thought and action – choosing, creating, exploring
Universalism	Understanding, appreciating, and protection for the welfare of all people and for nature
Benevolence	Preservation and enhancement of the welfare of other people with whom one is in frequent contact
Tradition	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms
Security	Safety, harmony, and stability of society, or relationships, and of self

Note. Adapted from Schwartz (1994, p. 22).

Extraversion

Previous studies focused on the relationship between values and personality in undergraduate university students have indicated that Extraversion is positively related to the values of Achievement, Stimulation, Hedonism (Roccas et al., 2002), Cheerfulness,

Exciting Life (Dollinger, Leong, & Ulicni, 1996), Social Power, and Order¹ (Aluja & Garcia, 2004). These studies have also demonstrated that Extraversion is negatively related to the values of Tradition (Roccas et al., 2002) and Logicalness (Dollinger et al., 1996),

Overall, Extraversion demonstrated a positive relationship with values that are similar to defining aspects of this personality trait. For instance, individuals who score high on Extraversion tend to be sociable, prefer to be in groups, like people, and are assertive and talkative. Extraverted individuals also tend to be active, cheerful, energetic, and optimistic (Costa & McCrae, 1992). As such, it is not surprising that values representing excitement, pleasure, and compassion (i.e., Stimulation, Hedonism, Cheerfulness, Exciting Life) are positively related to Extraversion.

The value of Achievement is not as visibly linked to Extraversion as values such as Cheerfulness and Hedonism are. However, Hedonism has been positively related to Extraversion and, according to Schwartz's model, Hedonism is related to Achievement (Roccas et al., 2002). Thus, it is not surprising that Achievement is also positively related to Extraversion.

The values of Social Power and Order also do not readily appear to relate to Extraversion. One distinctive element or facet of Extraversion is assertiveness, or the tendency to be forceful. Assertiveness might be relevant to the positive relationship between Extraversion and the value Order such that assertive individuals might value the ability to take charge of their social interactions. In terms of the relationship between Extraversion and Social Power, it is possible that because extraverted individuals tend to

¹ Instead of speaking about Extraversion, Aluja and Garcia (2004) used the term *Surgency*, which is defined as being talkative, energetic, and daring.

value interactions with others, they might also value being held in high esteem by others, especially those with whom they interact socially.

In addition to Extraversion's positive relationships with the above-mentioned values, this personality trait has been negatively related to the values of Tradition and Logicalness. Individuals scoring low on Extraversion tend to be reserved, independent, and even paced (Costa & McCrae, 1992). Given these characteristics, it is not surprising that individuals who score low on Extraversion would place emphases on the values of Tradition and Logicalness.

The current study uses Schwartz's values model to form the 9-factor structure for the DVS. As such, we expect to find similar relationships between Big Five personality traits and factors of the DVS that mirror Schwartz's model. Roccas et al.'s (2002) research on personality and values measured values with the Schwartz Value Scale (1994). Therefore, we draw primarily from their findings to inform expectations about values and personality. In terms of Extraversion, we expect to find positive relationships between Extraversion and both Hedonism and Achievement, and a negative relationship between Extraversion and the value of Tradition.

Openness to Experience

Research has also indicated that Openness to Experience is related to particular values. This personality trait was positively related to the values of Universalism, Self-direction, Stimulation (Roccas et al., 2002), World of Peace, World of Beauty, Broadmindedness, Imaginativeness, Intellectualness (Dollinger et al., 1996), Social Power, and Order² (Aluja & Garcia, 2004). Openness to Experience was negatively

² Aluja and Garcia (2004) used the term *Intellect* rather than Openness to Experience, which is defined as being creative, artistic, and imaginative.

related to the values of Power, Conformity, Security, Tradition (Roccas et al., 2002), Self-control, National Security, Pleasure, Social Recognition, Cleanliness, Obedience, and Responsibleness (Dollinger et al., 1996).

Overall, Openness to Experience has indicated a positive relationship with values that are similar to defining aspects of this personality trait. For instance, individuals who score high on Openness tend to have an active imagination, are sensitive to esthetics, and are attentive to inner feelings. They also have a preference for variety and intellectual curiosity, and demonstrate independence of judgment (Costa & McCrae, 1992). As such, it makes sense that values that seem to overlap with these characteristics are correlated with Openness (i.e., Universalism (e.g., valuing wisdom and a world of beauty), Self-direction, Stimulation, Broadmindedness, Imaginativeness, and Intellectualness) are positively related to Openness to Experience.

In terms of the values Social Power and Order, the link to Openness is less apparent. Specifically, it is not clear why individuals who score high on Openness (demonstrating characteristics such as preference for variety, independence, and curiosity; Costa & McCrae, 1992) would also place high value on Power and Order. Rather, it seems more plausible that individuals who score low on Openness (more conservative and traditional) would be more likely to value Social Power and Order (Aluja & Garcia, 2004).

Negative relationships have also been found between Openness to Experience and personal values. Given the characteristics of individuals who demonstrate high levels of Openness, it makes inherent sense that these individuals would not place particularly high value on Power, Conformity, Security, Tradition (see Roccas et al., 2002), Self-control, Responsibleness, Obedience, or Social Recognition (see Dollinger et al., 1996). It is not

clear, however, why high scores on Openness would be negatively related to the values National Security, Pleasure, or Cleanliness (see Dollinger et al., 1996).

Because we are drawing from Schwartz's (1994; Schwartz & Boehnke, 2004) model to form the factor structure for the DVS and are incorporating research findings of Roccas et al. (2002), we expect to find positive relationships between Openness and the values of Universalism and Self-direction, and negative relationships between Openness and the values of Power, Conformity, Security, and Tradition.

Agreeableness

In addition to the Big Five traits Extraversion and Openness to Experience, Agreeableness has been linked to personal values. Specifically, it has been positively linked to the values of Benevolence, Tradition, Conformity (Roccas et al., 2002), Helpfulness, Forgivingness, Cheerfulness, Honesty, Lovingness (Dollinger et al., 1996), and negatively connected to the values of Power, Achievement, Hedonism, Stimulation, Self-direction (Roccas et al., 2002), and Social Recognition (Dollinger et al., 1996).

Agreeableness demonstrates positive relationships with values that are similar to significant aspects of this personality trait. Individuals who score high on Agreeableness tend to be altruistic, sympathetic, and eager to help others. They also tend to be modest, obedient, and trusting (Costa & McCrae, 1992). As such, it is not surprising that these individuals also emphasized values resembling these characteristics (i.e., Benevolence, Tradition, Conformity, Helpfulness, Forgivingness, Cheerfulness, Honesty, and Lovingness).

In addition to Agreeableness' positive relationships with the above values, it demonstrates negative relationships with values. Given the characteristics of those who score high on Agreeableness, it is plausible that they would not place high importance on

the values of Power, Achievement, Hedonism, Stimulation, Self-direction, and Social Recognition. Moreover, placing low importance on these values is more consistent with the personality characteristics of altruism, helping others, and obedience.

In the current research, we expect Agreeableness to relate to DVS values as it would relate to similar SVS values. Therefore, again drawing from the research of Roccas et al. (2002), we expect Agreeableness to demonstrate positive relationships with Benevolence, Tradition, and Conformity, and negative relationships with Power, Achievement, Hedonism, and Self-direction.

Conscientiousness

Finally, in terms of the FFM of personality, research has demonstrated a positive relationship between Conscientiousness and the values of Achievement, Security, Conformity (Roccas et al., 2002), Ambitiousness, Cleanliness (Dollinger et al., 1996), and Order (Aluja & Garcia, 2004), and a negative relationship between Conscientiousness and Stimulation (Roccas et al., 2002) and Imaginative values (Dollinger et al., 1996).

Individuals who score high on Conscientiousness tend to concentrate on activities such as planning, organizing, and task completion. They are also purposeful, strong-willed, determined, scrupulous, punctual, and reliable (Costa & McCrae, 1992). Given these characteristics, it is not surprising that these individuals would place high importance on the values of Achievement, Security, Conformity (see Roccas et al., 2002), Ambitiousness, Cleanliness (Dollinger et al., 1996), and Order (see Aluja & Garcia, 2004). The positive association between Conscientiousness and these values is apparent.

Conscientiousness also demonstrates negative relationships with particular values. Because conscientious individuals tend to focus on order and duty (Costa & McCrae,

1992), it is easy to see why they would not place high importance on the values of Stimulation (Roccas et al., 2002) or Imagination (see Dollinger et al., 1996).

The current research proposes that Conscientiousness will demonstrate similar relationships to DVS values as it has demonstrated to similar SVS values. Therefore, because Conscientiousness was positively related to Achievement, Security, and Conformity in Roccas et al.'s (2002) research that measured values with the SVS, we expect to find the same relationships with the DVS values and Conscientiousness.

Although the above-mentioned studies considered values and personality of undergraduate university students, it is reasonable to assume that similar relationships between values and personality would likely hold in the general population and in the dental profession. Thus, in order to provide evidence of construct validity for the DVS, a FFM measure of personality will be administered in the current research.

In sum, because we anticipate that the DVS will reflect 9 of the possible 10 factors of the SVS, we expect that Big Five personality factors will demonstrate similar relationships to DVS values as they would to SVS values. Because none of the above research has found a relationship between Neuroticism and values, this expectation excludes the personality trait of Neuroticism. Also, because Roccas et al. (2002) measured values with the SVS, we used their findings to form specific inferences for the current research.

Comparing Dentist and Student Values

Another area of focus of the proposed research is to examine the relationship between the values of dental students and practitioners. Studying this relationship is important because, as suggested by Chamberlain et al. (2005), in order to predict success in dental school and therefore in dentistry as a career, normative data should be obtained

from both of these groups (also see Allport, Vernon, & Lindzey, 1970). In other words, by obtaining values data from students and dentists, decision makers may be more equipped to assess who will likely excel as a student and who will likely become a successful practitioner.

Although previous research has studied the relationship between values of dental students and dental faculty (Silberman, 1976a; 1976b), to my knowledge there have been only two attempts to compare the values of students and practitioners. McDaniel, Siler, and Isenberg (1988) compared values of recent graduates to their values as students and found that, overall, values were similar. Conversely, Loupe et al. (1979b) compared the values of practitioners to their values in dental school and found that values were different. No firm conclusions can be drawn from such a small quantity of research. Furthermore, these studies were focused more on assessing stability of values over time rather than comparing values of independent groups of students and dentists. The current research addresses this gap in the literature by studying the relationship between different groups of dental students' and practitioners' values.

In summary, because problems exist with the measurement of dentists' values, the current research will develop a psychometrically sound measure that can be used to draw meaningful inferences about the nature of values and professionalism specific to the dental profession. Another purpose of this research is to investigate the relationship between values scores obtained on the Schwartz Value Scale and the DVS. Relationships between the Schwartz measure and the Big Five measures should be replicated with the DVS because of the similar theoretical foundations of Schwartz's measure and the DVS. Finally, previous research focused on the relationship between the values of dentists and dental students is minimal and inconclusive. Therefore, the current research explores this

relationship by examining values scores of dentists and students on the newly developed DVS. To meet the goals of the proposed research the following hypotheses will be tested:

Hypothesis 1: The DVS will fit the theorized 9-factor model derived from Schwartz's model of values.

Hypothesis 2: Subscales of the DVS will demonstrate high internal consistency.

Hypothesis 3: Values scores assessed by the Schwartz Value Scale will be related to similar value scores assessed by the DVS.

Hypothesis 4a: Extraversion will be positively related to the DVS subscales of Achievement and Hedonism, and negatively related to Tradition.

Hypothesis 4b: Openness to Experience will be positively related to the DVS subscales of Universalism and Self-direction, and negatively related to Power, Conformity, Security, and Tradition.

Hypothesis 4c: Agreeableness will be positively related to the DVS subscales of Benevolence, Tradition, and Conformity, and negatively related to Power, Achievement, Hedonism, and Self-direction.

Hypothesis 4d: Conscientiousness will be positively related to the DVS subscales of Achievement, Security, and Conformity.

Hypothesis 5: Dentists' values, as measured with the DVS, will be related to students' values.

Study 1 will present the development of the DVS and Study 2 will compare the values of dentists and dental students using the DVS.

STUDY 1

Method

Phase 1: Scale Development

In the initial stage of scale development, four focus groups were conducted with subject matter experts (i.e., dental practitioners and dental faculty). The first three focus groups were held at Dalhousie University's dental school. During the admission interview process, interviewers (dental practitioners and faculty members interviewing dental school applicants) were invited to participate in a focus group with the purpose of discussing dentists' values. Interviewers who agreed to participate gathered in a meeting room during their lunch break, on one of three interview days, to contribute to the discussion of values. The fourth focus group was held at the Nova Scotia Dental Association (NSDA). Board members of the NSDA were invited to participate in a focus group prior to the beginning of a regularly scheduled association meeting.

In each of the focus groups, participants were asked to discuss four questions, each related to values (see Table 2). Each of the 4 focus groups ranged from 4 to 7 participants with a total of N=23. Participants graduated from dental school between the years of 1965 and 2004, and their average age was 44.6 years. Ten of the focus group participants were male, and 9 were female. Four individuals did not indicate their graduation year or gender and 5 did not indicate their age.

During the focus groups, each of the questions was presented to the participants individually, and participants were given time to consider and record their answers. Then, each participant shared his or her response with the group, which was followed by group discussion. After conclusion of the focus groups, all responses and discussions were

Table 2

Focus Group Questions

Question
1. Take a piece of paper and write down three values that you possess and rank them in order of importance. We will discuss thee values in a few minutes.
2. Try to remember back to when you decided to become a dentist. What was the most important factor than influenced your decision?
3. Think back over the last several years, Have you noticed any changes in what is important to you now (versus earlier)? What do you think prompted these changes?
4. The purpose of this discussion was to find out about dentists' values. Are there any important issues that no one has mentioned or are there additional questions we should have asked?

analyzed and amalgamated. If a particular value or concept was mentioned in more than one focus group, it was marked for inclusion in the new scale. For example, *honesty* was mentioned in at least two focus groups; therefore, it was included as a value in the scale. Concepts mentioned in only one focus group were excluded from further consideration unless subject matter experts deemed they were theoretically important. For example, *affordable dentistry* was mentioned in only one group but was incorporated into the scale.

The next step of scale development included conducting a literature review and locating previous research focused on values of individuals in the dental profession including practitioners, professors, and dental students. Based on the information gathered from the literature review and focus groups we composed 99 items for the new values measure. Upon completion of item writing, subject matter experts (i.e., dental faculty and individuals experienced in values and scale construction) reviewed the scale

items to ensure they were meaningful and appropriate in a dental context. After receiving and addressing feedback from these subject matter experts, the scale consisted of 92 items. At this stage, the scale was pilot tested with a small sample of dental faculty members (N=9).

Based on feedback from the pilot test, problematic items were revised or deleted. For example, the item “I am egalitarian” was deleted from the scale, and the item “I exhibit forthrightness” was changed to “I am sincere.” After addressing comments and refining the scale, the DVS contained 91 items, each beginning with the phrase, “In my career as a dentist, it is now or will be important that....”(adapted from Hartung et al. (2005) and Leong et al. (2005)). Sample items from this scale are “I have a social conscience,” and “I have autonomy in how I carry out my work” (see Appendix A).

Phase 2: Validation Procedure

After initial scale development and refinement, Canadian dental practitioners completed a four-part survey, comprised of the new Dentists’ Values Scale (DVS), the Schwartz Value Scale (SVS), the Mini-International Personality Item Pool (Mini-IPIP), and demographic questions.

Participants and Procedure

Dentists were recruited to participate in the study with assistance from the Canadian Dental Association (CDA). Specifically, during its regularly scheduled email communication the CDA sent two mass emails to approximately 9180 of its members, explaining that members were invited to participate in values-related research. The email directed individuals to the members section of the CDA website, where the web link to the survey was located (see Appendix B). Once participants clicked on the website link, their web browsers were directed to the online measures and they were presented with an

informed consent letter. This letter explained the purpose of the study and indicated that by completing and submitting the survey they agreed to participate in the research (see Appendix C).

All participants completed the survey online, with the exception on one individual who printed the survey and completed it by hand, and then returned it by mail. This research followed ethical standards and was approved by the Saint Mary's University Research Ethics Board. Participants did not receive any compensation for completing the survey and were free to withdraw their participation at any time without penalty.

Out of the 456 participants who completed the survey, 7 were still in dental school and not yet practicing. Therefore, responses of these individuals were removed from the dentist data and added to the student data, which was collected later. After removing these individuals, the total sample size was 449. Participants ranged in age from 22 to 78 ($M=47.89$), and graduated from dental school between the years of 1947 and 2007 and ($M=1985$). 71.7% of participants were male. Career type of the sample was as follows: general practice 80.8%, public health 2.7%, educational dentistry 2.7%, and other specialty 13.4%. Practice locations of the sample were 94.2% urban, 3.6% rural, and 1.8% remote.³

Measures

The following measures were presented to the participants as a four-part online survey: demographics, dentists' career related values, personal values, and personality. The survey procedure was completely anonymous. Participants followed a website link to

³ Practice location options were presented to participants as follows: Urban – population of at least 1000, Rural – population under 1000, Remote – rural community 80-400 km from a major regional hospital, and Isolated – rural community greater than 400 km from a major regional hospital.

an external online survey hosting organization (Infopoll) where they completed the survey. No identifying information about who participated in the study was recorded.

Demographics. Participants were asked to indicate their gender, year of graduation, age, career type (general practitioner, public health, educational dentistry, research, or other specialty), and practice location (urban, rural, remote, or isolated).

Dentists' Career Related Values. The 91-item Dentists' Values Scale (DVS) developed in Phase 1 measured dentists' values related to their careers. Items in the DVS are scored on a 5-point rating scale (1 = *strongly disagree*; 5 = *strongly agree*) indicating to what extent participants possess particular values (see Appendix A). Reliabilities for the final scale, after refinement, are discussed below (see Results).

Personal Values. In addition to the DVS, values were measured with the Schwartz Value Scale (SVS). This 46-item scale is usually scored on a 9-point scale indicating to what extent individuals judge each value as a guiding principle in their lives (Schwartz, 1994; Schwartz & Boehnke, 2004). For the current research, response options of the SVS were adjusted to a 5-point scale (1 = *opposed to my values*; 5 = *of supreme importance*) to be more consistent with the rating scale of the DVS. Sample items of the SVS are "Protecting the environment" and "National security" (see Appendix D). Reliabilities of the 10 subscales of the SVS in the current research are as follows: Power $\alpha = .66$, Achievement $\alpha = .63$, Hedonism $\alpha = .55$, Stimulation $\alpha = .64$, Self-direction $\alpha = .70$, Universalism $\alpha = .81$, Benevolence $\alpha = .74$, Tradition $\alpha = .67$, Conformity $\alpha = .54$, and Security $\alpha = .61$.

Personality. Personality traits were assessed with the Mini-International Personality Item Pool (Mini-IPIP), a 20-item measure of the FFM of personality that assesses Extraversion, Conscientiousness, Neuroticism, Openness to Experience, and

Agreeableness. The Mini-IPIP directs participants to indicate how well each statement describes them on a 5-point scale. Response options range from 1 = *very inaccurate* to 5 = *very accurate* (Donnellan, Oswald, Baird, & Lucas, 2006; "IPIP"). Sample items of the Mini-IPIP are "Talk to a lot of different people at parties" and "Feel others' emotions" (see Appendix E). Reliabilities of the Mini-IPIP in the current research were Neuroticism $\alpha = .72$, Extraversion $\alpha = .76$, Openness $\alpha = .67$, Agreeableness $\alpha = .69$, and Conscientiousness $\alpha = .60$.

Results

Data Cleaning and Screening

Before testing research hypotheses, data were inspected to eliminate errors, test assumptions, and deal with potential outliers. Data from four dentists were excluded from analyses because they were outliers on a substantial number of variables. In total, the final sample size for analyses consisted of 445 participants. All analyses were conducted with SPSS 11.0 unless specified otherwise.

Initial Factor Structure, Scale Refinement, and Reliability

To test Hypothesis 1 and examine whether the hypothesized 9 factors were present in the item pool, we conducted an initial unrotated principle components analysis (PCA) on a random 50% of the data. The initial PCA revealed 23 variables with eigenvalues over one; however, because the scree plot indicated 5 factors, Hypothesis 1 was rejected, and further analyses focused on scale refinement and reducing the number of total scale items. After PCA, we conducted exploratory factor analysis with principle axis factoring (PAF) with promax and varimax rotations. Because we concentrated on item reduction, PAF was performed several times with alternating rotations, deleting items with loadings of less than .40 on each new run.

The final PAF run, with promax rotation, resulted in a clear 5-factor scale, with all loadings over .40 (see Table 3). The 5 underlying traits or factors of the scale were labeled Altruism, Personal Satisfaction, Conscientiousness, Quality of Life, and Professional Status. Altruism refers to values such as being caring, considerate, and empathetic; Personal Satisfaction refers to the values of harmony, self-respect, and having an enjoyable life; Conscientiousness refers to the values of behaving ethically, competently, and dependably; Quality of Life refers to the values of earning a good living, achieving financial stability, and having a comfortable life; and Professional Status refers to the values of ambition, prestige, and belonging to a respected profession. The total model accounted for 48.78% of variance.

At this stage of data analysis, we focused on reducing the number of items of each DVS factor. Although at 61 items the DVS is a clear 5-factor scale with excellent loadings, our priority was to maximize usability of the scale. Practically, this scale is intended for use as a dental school selection or development tool, and would likely be used in conjunction with other measures. As such, administering a 61-item values measure would likely be cumbersome, which would limit the scale's use. Thus, we retained the top 5 loadings (see Table 3) on each scale factor for further reliability analysis, using all available dentist data. As illustrated in Table 4, Cronbach's alphas for the reduced 25-item DVS are as follows: Altruism $\alpha = .84$, Personal Satisfaction $\alpha = .88$, Conscientiousness $\alpha = .83$, Quality of Life $\alpha = .88$, and Professional Status $\alpha = .66$. These values demonstrate partial support for Hypothesis 2, which stated that subscales of the DVS would demonstrate high internal consistency.

Table 3
Exploratory factor analysis with promax rotation, means, and standard deviations.

Factor	1	2	3	4	5	M	SD
1. I am sensitive toward others	.87					4.44	.55
2. I am understanding	.78					4.41	.54
3. I am kind to others	.77					4.56	.51
4. I accept others despite their flaws	.76		-.35			4.03	.70
5. I behave compassionately	.69					4.51	.53
6. I display empathy toward my patients	.66					4.62	.50
7. I display cultural sensitivity	.64					4.31	.70
8. I am caring	.63					4.59	.49
9. I respect others	.60					4.51	.53
10. I am accepting of everyone	.59		-.34			3.85	.86
11. I am considerate	.58					4.52	.51
12. I have a social conscience	.57					4.49	.59
13. I am aware of values of different cultures	.56					4.07	.75
14. I recognize the value in other people	.55					4.46	.52
15. I am able to help others	.54					4.48	.52
16. I am helpful to society	.49					4.35	.58
17. I am flexible	.48					4.13	.65
18. I am able to work with people	.47					4.55	.52
19. I work with a variety of patients	.46					4.33	.72
20. I am satisfied with my life outside of work		.87				4.32	.79
21. I have harmony in my life		.87				4.20	.89
22. I am happy		.83				4.31	.75
23. I am successful in my career		.76				4.11	.87
24. I have quality time away from work		.68				4.17	.82
25. I am satisfied with my work/career		.67				4.36	.77
26. I am comfortable with who I am		.61				4.43	.69
27. I achieve personal satisfaction		.61				4.37	.70
28. My job is enjoyable		.57				4.27	.69
29. I am able to spend time with my family and friends		.55				4.36	.74
30. I find joy in my life		.55				4.39	.61
31. I have control over my work life		.55				4.06	.79
32. My life is enjoyable		.51				4.37	.67
33. My work brings me pleasure		.49				4.32	.69
34. I have self-respect		.46				4.52	.59
35. I maintain integrity (in my profession)			.80			4.74	.45
36. I am honest			.80			4.81	.39
37. I carry out my work conscientiously			.75			4.77	.42
38. I am competent			.73			4.62	.49
39. I behave ethically			.71			4.80	.41
40. My quality of work is high			.63			4.60	.52
41. I provide the best possible care to my patients			.59			4.81	.44
42. I display professionalism			.58			4.63	.51
43. I am detail oriented			.55			4.47	.65
44. I am sincere			.55			4.72	.46
45. I possess intellectual skills			.54			4.57	.52
46. I am capable to carry out my work			.51			4.62	.50
47. I am responsible			.50			4.66	.49
48. I am analytical			.48			4.46	.60
49. I am dependable			.43			4.60	.55
50. I earn a good living				.84		4.31	.62
51. I am well paid				.80		4.12	.69
52. I maintain financial security				.80		4.16	.76
53. I earn a reasonable income				.74		4.21	.63
54. I achieve financial stability				.60		4.14	.81
55. My life is comfortable				.52		4.29	.62
56. I have a high quality of life				.49		4.26	.72
57. I achieve prestige					.65	3.54	.93
58. I am devoted to my job					.54	4.15	.77
59. My work is related to the medical field					.51	4.45	.66
60. I belong to a respected profession					.44	4.37	.65
61. I am ambitious					.43	3.95	.87

Confirmatory Factor Analysis

To assess fit of the 5-factor structure of the DVS to the data, we conducted confirmatory factor analysis (CFA) using EQS 6.1. Because we wanted to increase sample size, we combined the initial random 50% sample with the holdout sample for this particular analysis.

When judging CFA model fit, the value of χ^2 is, ideally, nonsignificant. Our value was significant, $\chi^2 = 659.927, p < .01$, indicating that the model might be a poor fit. Tabachnick and Fidell (2007) indicated, however, that χ^2 is a very sensitive statistic and, as such, other indicators of fit should be considered. Hu and Bentler (1999) suggested using a minimum of two fit indices when describing CFA results, one of which should be the standardized root mean square residual (SRMR) because it is the most sensitive to misspecification error. Tabachnick and Fidell (2007) noted that the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) are the most commonly reported fit indices. Therefore, these three maximum likelihood indices will be reported in this paper.

According to Hu and Bentler (1999), SRMR should have a value of .08 or less. SRMR = .052 in the current study, well within the preferred cutoff point. Also according to Hu and Bentler (1999), good fitting models should have CFI values above .95. CFI = .915 in this study, indicating that the model is not ideal, but is approaching a good fit. RMSEA should be .06 or less in good fitting models (Hu & Bentler, 1999). RMSEA = .06 in the current research, which meets the recommended cutoff point. Overall, fit indices indicated that the model was a good fit. In addition to the model being a good overall fit, each item loaded significantly onto its respective scale. Furthermore, individual scale items accounted for at least 22.1% of variance in the solution.

Table 4
Correlations among DVS factors and other constructs, and Dentists' Value Scale Reliabilities.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Altruism	(.84)																			
2. Personal Satisfaction	.25**	(.88)																		
3. Conscien.	.45**	.30**	(.83)																	
4. Quality of Life	.20**	.41**	.19**	(.88)																
5. Professional Status	.31**	.13*	.32**	.33**	(.66)															
6. Universalism	.39**	.09	.19**	.06	.28**															
7. Benevolence	.57**	.19**	.45**	.17**	.31**	.52**														
8. Tradition	.45**	.13**	.17**	.13*	.38**	.49**	.52**													
9. Conformity	.34**	.08	.24**	.11*	.35**	.45**	.61**	.67**												
10. Security	.24**	.00	.24**	.09	.36**	.50**	.49**	.40**	.50**											
11. Power	.14**	.02	.04	.11*	.42**	.33**	.18**	.30**	.22**	.44**										
12. Achievement	.23**	.09	.28**	.18**	.58**	.32**	.31**	.36**	.37**	.46**	.55**									
13. Hedonism	.14**	.14**	.12*	.16**	.24**	.30**	.21**	.25**	.24**	.33**	.40**	.44**								
14. Stimulation	.22**	.10	.21**	.14**	.33**	.40**	.33**	.32**	.24**	.38**	.43**	.45**	.41**							
15. Self Direction	.33**	.07	.37**	.17**	.39**	.53**	.47**	.30**	.34**	.42**	.31**	.49**	.34**	.49**						
16. Extraversion	-.16**	-.11*	-.05	.00	-.19**	-.08	-.07	-.02	.05	-.09	-.14**	-.19**	-.17**	-.21**	-.15**					
17. Agreeableness	-.37**	-.08	-.13*	.01	-.10	-.37**	-.35**	-.21**	-.17**	-.14**	-.06	-.04	-.03	-.11*	-.17**	.21**				
18. Conscien.	-.20**	-.12*	-.16**	-.18**	-.19**	-.19**	-.23**	-.25**	-.23**	-.28**	-.08	-.19**	-.02	-.01	-.20**	.07	.21**			
19. Neuroticism	.20**	.33**	.15**	.17**	.18**	-.08	.04	.02	-.01	-.08	-.01	.00	-.01	.10	.03	-.11*	.03	-.07		
20. Openness	-.18**	-.08	-.14**	-.01	-.11*	-.24**	-.17**	-.07	-.02	-.12*	-.06	-.09	.00	-.25**	-.34**	.26**	.30**	.08	-.03	

Note. * $p < .05$, ** $p < .01$. DVS factors are labeled 1 to 5, SVS factors are labeled 6 to 15, and Mini-IPIP factors are labeled 16 to 20.

Scale Validity

To investigate construct validity of the DVS, we examined relationships between its scales, SVS scales, and Mini-IPIP scales using Pearson product-moment correlations (see Table 4).

Correlations with Schwartz Value Scale

Hypotheses 3 stated that SVS scores would be related to DVS scores; Hypotheses 4a, 4b, 4c, and 4d indicated specific relationships among DVS scores and Extraversion, Openness, Agreeableness, and Conscientiousness, respectively and were based on the assumption that DVS items would conform to a 9-factor structure (Power, Achievement, Hedonism, Self-direction, Universalism, Benevolence, Tradition, Conformity, and Security). Because exploratory factor analysis results indicated that our data fit a 5-factor structure, these hypotheses could not be tested. Therefore, we concentrated on describing the relevant correlations among DVS scales and scales of other constructs (i.e., SVS and Mini-IPIP).

Correlations among DVS and SVS scales ranged from $r = .00$, *ns* (Altruism, DVS, and Security, SVS) to $r = .58$, $p < .01$ (Professional Status, DVS, and Achievement, SVS). Of particular interest are the correlations between factors of the SVS and similar factors of the DVS. For instance, the DVS and SVS each contain factors relating to *helping, caring for, and respecting others* (Altruism in DVS, Benevolence, Tradition, and Universalism in SVS), *prestige and public perception* (Professional Status in DVS, Power and Achievement in SVS), and *competence* (Conscientiousness in DVS and Achievement in SVS).

In terms of factors related to helping, caring for, and respecting others, correlations between DVS and SVS factors demonstrate that both scales are measuring similar values. For instance, the correlation between Altruism (DVS) and Benevolence (SVS) is $r = .57, p < .01$, the correlation between Altruism (DVS) and Tradition (SVS) is $r = .45, p < .01$, and the correlation between Altruism (DVS) and Universalism is $r = .39, p < .01$. With respect to scale factors relating to prestige and public perception, similar relationships demonstrate that the DVS and SVS are measuring similar values. Specifically, the correlation between Professional Status (DVS) and Power (SVS) is $r = .42, p < .01$, and the correlation between Professional Status (DVS) and Achievement (SVS) is $r = .58, p < .01$. In terms of factors relating to competence, the DVS and SVS are also measuring similar values; the correlation between Conscientiousness (DVS) and Achievement (SVS) is $r = .28, p < .01$. As mentioned above, none of these correlations are surprising because elements of each pair of correlating factors contain similar constructs. Each of these correlations provides evidence for validity of the DVS.

In addition to relationships between DVS and SVS factors that are unsurprising, there is one correlation that is surprising. Specifically, because there is similarity between the constructs of Personal Satisfaction (DVS) and Hedonism (SVS; they both depict pleasure) we might expect a substantial relationship between these two values. Although the correlation between these factors was significant ($r = .14, p < .01$) it was of low magnitude and therefore is likely of little practical significance.

Correlations with Mini-IPIP

Correlations among DVS values and Mini-IPIP personality traits ranged from $r = -.37, p < .01$ (Altruism, DVS, and Agreeableness, Mini-IPIP) to $r = .33, p < .01$ (Personal

Satisfaction, DVS, and Neuroticism, Mini-IPIP). All but 7 of the correlations between DVS and Mini-IPIP factors were significant at the .01 or .05 level. However, due to the large sample size of the current research these correlations might not be practically meaningful in terms of effect size. In total, four correlations were at least .20 including two that were greater than .30. These values indicate small effects among the DVS and Mini-IPIP scales.

The correlation between Agreeableness (Mini-IPIP) and Altruism (DVS) was $r = -.37, p < .01$, indicating that those who have high scores on the value of Altruism (DVS) tend to have lower levels of the personality trait of Agreeableness (Mini-IPIP). Similarly, the correlation between the personality trait of Conscientiousness (Mini-IPIP) and the value of Altruism (DVS) was $r = -.20, p < .01$, indicating that individuals who score high on the personality trait of Conscientiousness (Mini-IPIP) tend to score lower on the value of Altruism as assessed with the DVS. The correlation between the personality trait of Neuroticism (Mini-IPIP) and the value of Altruism (DVS) was $r = .20, p < .01$, demonstrating that those who value Altruism (DVS) tend to possess higher levels of the personality trait Neuroticism (Mini-IPIP). Finally, the correlation between Neuroticism (Mini-IPIP) and Personal Satisfaction (DVS) was $r = .33, p < .01$; those who value Personal Satisfaction (DVS) tend to be more Agreeable (Mini-IPIP).

DVS values of Conscientiousness, Quality of Life, and Professional Status do not appear to be practically related to any personality traits assessed by the Mini-IPIP. For the value of Conscientiousness, correlations range between $r = -.16, p < .01$ (personality trait of Conscientiousness) and $r = .15, p < .01$ (personality trait of Neuroticism). For the value of Quality of Life, correlations range between $r = -.18, p < .01$ (personality trait of

Extraversion) and $r = .17, p < .01$ (personality trait of Neuroticism). For the value of Professional Status, correlations range from $r = -.19, p < .01$ (personality traits of Extraversion and Conscientiousness) to $r = .18, p < .01$ (personality trait of Neuroticism). Overall, these correlations indicate that DVS values are not related to Mini-IPIP personality traits.

Discussion

The primary purpose of Study 1 was to develop and validate a psychometrically sound measure of dentists' values. Although dentists' and dental students' values have been measured in the past, they have not revealed a clear picture of values related to dentistry. Our results did not support the 9-factor model of values. Exploratory factor analysis results showed strongest support for a 5-factor model (Altruism, Personal Satisfaction, Conscientiousness, Quality of Life, and Professional Status) encompassing 61 of the original 91 items. Exploratory factor analysis results also indicated that the scale measures constructs consistent with aspects of previous dental values research. Reliability analysis of the 5 highest loading items on each of the 5 factors allowed us to further narrow down the scale to 25 items, 5 on each factor. CFA results indicated that the model was a good fit to the data and that all scale items loaded significantly onto their respective scales.

Internal consistencies of the DVS factors were moderate (.83 to .88) with the exception of Professional Status (.66). These internal consistency values suggest that the DVS is a reliable measurement tool.

DVS factors tended to relate appropriately to parallel factors in an existing values measure, the SVS. Specifically, the DVS and SVS contain common elements: helping,

cares for, and respecting others; prestige and public perception; and competence. Correlations between factors of the DVS and SVS demonstrated that each of these common elements is positively related, thereby providing validity evidence for the DVS. Overall, results indicated that the DVS is a valid values measure.

In terms of the relationships between values assessed with the DVS and personality assessed with the Mini-IPIP, three DVS factors (Conscientiousness, Quality of Life, and Professional Status) did not seem to be related to personality. Furthermore, statistically significant correlations between the remaining DVS factors (Altruism and Personal Satisfaction) and personality traits were low in magnitude, indicating low to small effects among the DVS and Mini-IPIP scales. Thus, the nature of the relationships between the DVS factors and Mini-IPIP traits suggests that the DVS is not capturing personality. Rather, as indicated by its correlations with SVS factors, it is measuring dentists' values related to their careers.

The final 25-item Dentists' Values Scale was primarily comprised of items reflecting values gleaned from focus group data, collected during the scale construction phase of this research. Therefore, we are confident that the scale represents the domain of interest and demonstrates content validity.

Overall, the current findings provide initial support for the psychometric properties of the newly created DVS. It is a valid and reliable measure that assesses values related to the dental profession.

STUDY 2

Study 2 was conducted to obtain initial normative data for the DVS. Specifically, the DVS developed and validated with dentists in Phases 1 and 2 was administered to a sample of dental students, and the values of these two groups were compared.

Method

Participants and Procedure

Dalhousie University dental students from years one through four were recruited to participate in a study investigating the values of dental students and dentists. Initially, students received an email explaining the purpose of the study and requesting their participation (see Appendix F). Approximately three days later, the students received a second email including the informed consent form (see Appendix G) and DVS as an attachment in the form of a word document. In this email, the students were asked to complete the measure and return it by email (see Appendix H). Next, dental students received an additional email reminding them to complete and return the survey if they wished to participate in the research (see Appendix I).

Because the initial response rate was lower than expected (42 respondents out of approximately 160 students), on two separate occasions an additional email was sent to the students inviting them to a pizza party and explaining that they would be eligible to win one of three prizes if they participated in the research. All students who had previously participated were also invited for pizza and were told they were eligible to win one of the prizes (see Appendix J). In total, two pizza parties were held. This research followed ethical standards and was approved by the Research Ethics Boards of St. Mary's University and Dalhousie University.

Eighty-nine students were recruited to participate in the research. With the addition of 7 students who completed the dentist survey, the total sample size was 96. Participants ranged in age from 21 to 42 ($M=26.02$), and expected to graduate from dental school between the years of 2008 and 2011 ($M=2009$). 45.3% of participants were male. Expected career type of the sample was as follows: general practice 89.5%, educational dentistry 1.1%, research 1.1%, and other specialty 8.4%. Furthermore, expected practice locations of the sample were 77.9% urban, 16.8% rural, and 3.2% remote.

Measures

During Study 2 of the current research, dental students were invited to complete a survey comprised of the DVS and demographic questions.

Demographics

Dental students were asked to provide the same demographic information as dentists (i.e., gender, year of graduation, age, career type, and practice location). However, because the students were not yet practicing, they were asked to indicate their *expected* practice type and *expected* practice location.

Dental Students' Career Related Values

Scale refinement of the DVS (see Results, Study 1) was not complete before beginning data collection with the current student sample. Therefore, although results are discussed in terms of the final 25-item scale, dental students completed the same 91-item DVS, which was created in Study 1, Phase 1, and was administered to dentists as the first section of the four-part survey in Study 1, Phase 2. Dental students received and returned the measure as an email attachment or completed the DVS as a pen-and-paper survey.

Cronbach's alphas for the reduced 25-item DVS for the present student sample are as follows: Altruism $\alpha = .86$, Personal Satisfaction $\alpha = .82$, Conscientiousness $\alpha = .78$, Quality of Life $\alpha = .90$, and Professional Status $\alpha = .56$.

Results

Data Cleaning and Screening

Before hypothesis testing, data were inspected to eliminate errors, test assumptions, and deal with potential outliers. Data of one student were excluded from analyses because the participant was an outlier on a substantial number of variables. Also, data of one participant in the student sample was deleted because of an irregular response pattern. In total, the final sample size for analyses consisted of 94 participants.

Comparing Dentist and Student Values

Independent samples t-tests were conducted to test Hypothesis 5, which stated that dentists' values would be related to students' values. As illustrated by Table 5, there were no significant differences between career stage (i.e., dentist versus student) and the values of Altruism, $t(528) = -.542$, *ns* or Professional Status, $t(532) = -.116$, *ns*. Using .05 as the cutoff for alpha, there were significant differences between groups for the DVS values of Conscientiousness, $t(532) = 1.997$, $p = .046$, Quality of Life, $t(526) = 2.156$, $p = .032$, and Personal Satisfaction, $t(528) = -3.839$, $p = .000$. Therefore, Hypothesis 5 was partially supported. The values of Altruism and Professional Status, assessed with the DVS, were similar for students and dentists, and the values of Conscientiousness, Quality of Life, and Personal Satisfaction were different for students and dentists. Dentist and student mean scores, standard deviations, and effect sizes on the DVS scale factors (Altruism, Personal Satisfaction, Conscientiousness, Quality of Life, and Professional

Status) are reported in Table 5. For Altruism, $M_{\text{Dentist}} = 4.39$ and $M_{\text{Student}} = 4.42$; for Personal Satisfaction, $M_{\text{Dentist}} = 4.20$ and $M_{\text{Student}} = 4.48$; for Conscientiousness, $M_{\text{Dentist}} = 4.75$ and $M_{\text{Student}} = 4.67$; for Quality of Life, $M_{\text{Dentist}} = 4.16$ and $M_{\text{Student}} = 4.00$; and for Professional Status, $M_{\text{Dentist}} = 4.10$ and $M_{\text{Student}} = 4.11$.

Table 5

Means, standard deviations, t-tests, and effect sizes between DVS factors and career stage.

Factor	<i>t</i>	<i>p</i>	Dentist <i>M</i>	Student <i>M</i>	Dentist <i>SD</i>	Student <i>SD</i>	<i>d</i>
Altruism	-.542	.588	4.39	4.42	.444	.499	.06
Personal Satisfaction	-3.839	.000	4.20	4.48	.672	.508	.47
Conscientiousness	1.997	.046	4.75	4.67	.336	.378	.22
Quality of Life	2.156	.032	4.16	4.00	.030	.071	3.13
Professional Status	-.116	.908	4.10	4.11	.498	.460	.02

Discussion

The purpose of Study 2 was to assess the relationship between dentists' and dental students' values. T-tests demonstrated that, for the values of Altruism and Professional Status, values of dentists tended to be similar to values of dental students. There were statistical differences between the groups for the remaining values. However, with the exception of Quality of Life, these differences might not be meaningful in terms of effect size. Based on Cohen's (1988) criteria, the effect size for Conscientiousness ($d = .22$) indicates that the difference between the two groups is close to small. Similarly, the effect size for the value of Personal Satisfaction ($d = .47$) indicates that the difference between

the groups is almost medium. These results are important in terms of establishing initial norms for the DVS.

These findings also have implications for individuals who make admissions and curriculum decisions. Because it is possible that this sample of students possessed the values before they were admitted to dental school, admission authorities could view these findings as an indication that they have selected students into their dental program who might be predisposed to become principled, professional dentists. It is also possible that dental students' values have developed during their progression through the dental school program. As such, individuals who make decisions about dental school curriculum may view these findings as positive reinforcement for the curriculum at their school.

Limitations, Future Research, and Practical Applications

In addition to the positive aspects of the current research, there are also limitations and suggestions for future research. The first recommendation in terms of future research concerns research samples. In this research, the sample of dental students was obtained from a single dental school. Therefore, our findings regarding dentist and dental student values might not apply to other dental student samples. Future research should administer the DVS to a broad sample of dental schools to determine if the relationships hold, and whether values are consistent across dental schools.

Future researchers should also administer the DVS to prospective dental students to determine whether the values obtained in this research are characteristic of individuals before they are exposed to dental school, or whether dental school curriculum and/or culture influence student values. Furthermore, future studies should explore whether DVS scores differentiate between applicants who are admitted and those who are not permitted

into dental school. Information obtained from such studies would position authorities to consider using the DVS for purposes of dental student selection⁴ and development.

The DVS should also be administered to the general population and to individuals in other professions. Obtaining such data would assist authorities to determine if DVS values are characteristic of dentists in particular or are representative of the general public and other professions.

Second, the current research did not obtain any criterion-related validity evidence for the DVS. Future studies should obtain performance data from dentists and dental students to determine the extent to which the DVS predicts important outcomes such as job performance, client satisfaction, or success in dental school.

Third, the reliability of the DVS factor Professional Status is not ideal ($\alpha = .66$). Therefore, future researchers should focus on increasing the reliability of this particular factor by improving existing scale items or creating new items.

Fourth, future studies should focus on the relationship between Big Five personality factors and values. In the current research, there were few meaningful relationships found between dentists' values and their personality traits. Future researchers should determine whether the lack of meaningful relationships between personality and values in the current research holds across different samples.

Fifth, this research defined an urban practice location as one that has a population of at least 1000. This definition does not differentiate between large cities and smaller towns and, as a result, we risk losing valuable information about dental practice locations.

⁴ It is possible that admitting individuals based solely on a measure such as the DVS might result in a homogeneous pool of students. Therefore, I recommend that the DVS be used in conjunction with other tools and that processes are implemented to ensure diversity in dental schools and in the dental profession.

Therefore, future researchers should improve the definition of urban. With an improved definition, researchers would be in a position to determine if values of dentists practicing in large cities are different from values of dentists practicing in smaller towns.

Sixth, future research should focus on establishing whether there is a difference between values of dentists who work in various areas of dentistry. For instance, it would be interesting to determine if values of dentists in academia are different than values of dentists in general practice. In this research, sample size in each area of dentistry (i.e., general practice, public health, educational dentistry, research, other specialty) was not large enough to conduct meaningful analysis. Future studies should concentrate on obtaining sample sizes large enough to draw conclusions about the values of dentists in each of these areas. Obtaining such information would equip mentors and dental faculty to counsel students who are undecided about their specialty about the areas of dentistry to which they might be best suited. For example, students exhibiting high levels of the value Personal Satisfaction might be more suited to pursue a career in academia if dentists in academia also tend to demonstrate high levels of Personal Satisfaction.

Finally, the DVS consisted entirely of positively worded items. As such, results might be influenced by response acquiescence, or the tendency of participants to agree with scale items as a general response pattern (Coolican, 1999). Therefore, results of this research should be interpreted with this caution in mind.

In terms of practical applications for the DVS, the opportunities are numerous. For instance, the scale could be used with dental practitioners, who could view their values scores as an indication about how they compare to other practitioners. If practitioners determine that their values are fundamentally different than values of other

practitioners, then they might wish to engage in self-development activities to enhance their values.

The DVS could also be a valuable tool to implement in values training with dental students. If the scale was administered and revealed that students did not exhibit values deemed essential for success in dentistry, then development activities could be implemented to influence and change the students' values. Such activities could include the behaviour of dental faculty. For example, they could mentor students about values and could model values for students to observe. Furthermore, dental schools could make changes to curriculum and include courses on values-related material and could create systems that acknowledge and reward students who demonstrate appropriate values. One school in particular, Dalhousie University Dental School, has already begun the process of enhancing values in its curriculum by initiating a course on mindfulness, which concentrates on issues such as self-awareness and quality of life.

CONCLUSION

In conclusion, our research takes an important initial step in filling a gap in dentistry research by establishing a reliable and valid measure that assesses values specifically related to the dental profession. This research found that there are 5 broad factors that can be used to describe dentists' values: Altruism, Personal Satisfaction, Conscientiousness, and Professional Status. Reliability and correlational analyses indicated that the measurement tool created in the current research reliably and validly assesses these 5 broad factors, but does not capture personality. Because we refined the scale from 91 to 25 items, this scale is also very well suited for use in a practical setting. Furthermore, t-tests indicated that for the values of Altruism and Professional Status,

dental students demonstrated similar values to dentists, which is encouraging information for individuals who are authorities of the dental school involved in this research. Dental school authorities should consider using this scale to enhance their admissions processes or to establish dental school curriculum.

REFERENCES

- Allport, G., Vernon, P., & Lindzey, G. (1970). *Manual: Study of Values*, Boston: Houghton Mifflin Co.
- Aluja, A., & Garcia, L. F. (2004). Relationships between Big Five personality factors and values. *Social Behavior and Personality*, 32, 619 - 626.
- Arnold, L. (2002). Assessing professional behavior: Yesterday, today, and tomorrow. *Academic Medicine*, 77, 502 - 515.
- Becker, B. W., Kaldenberg, D. O., & Connor, P. E. (1996). Dentists' personal values: An exploratory investigation. *Journal of the American Dental Association*, 127, 503 - 509.
- Brookhart, S., & Sanford, E. (Eds.). (1995) *The Twelfth Mental Measurements Yearbook* (Vols. 12). Lincoln, NE: Buros Institute of Mental Measurements.
- Cain, M., Silberman, S., Mahan, J., & Meydrech, E. (1983). Changes in dental students' personal needs and values. *Journal of Dental Education*, 47, 604 - 608.
- Casada, J. P., Willis, D. O., & Butters, J. M. (1998). An investigation of dental student values. *Journal of the American College of Dentists* 65, 36 - 41.
- Chamberlain, T. (2003). Defining and assessing professionalism in dentistry.
- Chamberlain, T., Catano, V., & Cunningham, D. (2005). Personality as a predictor of professional behavior in dental school: Comparisons with dental practitioners. *Journal of Dental Education*, 69, 1222 - 1237.
- Chambers, D. (2001). The role of dentists in dentistry. *Journal of Dental Education*, 65, 1430 - 1440.

- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Coolican, H. (1999). *Research Methods in Psychology. Research Methods in Psychology (3rd ed).* London: Hodder & Stoughton.
- Costa, P., & McCrae, R. (1992). *Revised NEO Personality Inventory (NEO-PI- R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual*: Odessa, FL: Psychological Assessment Resources Inc.
- Crossley, M. L., & Mubarik, A. (2002). A comparative investigation of dental and medical student's motivation towards career choice. *British Dental Journal*, 193, 471 - 473.
- Dollinger, S. J., Leong, F. T., & Ulicni, S. A. (1996). On Traits and Values: With special reference to Openness to Experience. *Journal of Research in Personality*, 30, 23 - 41.
- Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP Scales: Tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment*, 18, 192 - 203.
- Dworkin, S. F. (1979). Dental aptitude test as predictors of performance over four years of dental school: Analysis and interpretation. *Journal of Dental Education*, 34, 58 - 62.
- Epstein, R., & Hundert, E. (2002). Defining and assessing professional competence. *Journal of the American Medical Association*, 287, 226 - 234.

- Hartung, P. J., Taber, B. J., & Richard, G. V. (2005). The Physician Values in Practice Scale: Construction and initial validation. *Journal of Vocational Behavior, 67*, 309 - 320.
- Hojat, M., Brigham, T. P., Gottheil, E., Xu, G., Glaser, K., & Veloski, J. J. (1998). Medical students' personal values and their career choices a quarter-century later. *Psychological Reports, 83*, 243 - 248.
- Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analyses: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1 - 55.
- International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality Traits and Other Individual Differences from (<http://ipip.ori.org/>). Internet web site
- Kramer, G. A. (1986). Predictive validity of the Dental Admission Test. *Journal of Dental Education, 50*, 526 - 531.
- Leong, F., Hardin, E., & Gaylor, M. (2005). Career specialty choice: A combined research-intervention project. *Journal of Vocational Behavior, 67*, 69 - 86.
- Loupe, M., Meskin, L., & Mast, T. (1979a). Changes in the values of dental students and dentists over a ten-year period. *Journal of Dental Education, 43*, 171 - 175.
- Loupe, M., Meskin, L., & Mast, T. (1979b). Changes in values of dental students and dentists over a ten-year period. *Journal of Dental Education, 43*, 170 - 175.
- Manhold, J., Shatin, L., & Manhold, B. (1963). Comparison of interest, needs and selected personality factors of dental and medical students. *Journal of the American Dental Association, 52*, 601 -1605.

- McDaniel, S., Siler, W., & Isenberg, B. (1988). Comparison of personality variables and values among dental students, practitioners, and faculty. *Journal of Dental Education, 52*, 156 - 159.
- Merriam-Webster's Online Dictionary. (2005). *Merriam-Webster Online* Retrieved April 15, 2007, from <http://www.m-w.com/dictionary/professionalism>
- Murdoch, M., Kressin, N., Fortier, L., Giuffre, P. A., & Oswald, L. (2001). Evaluating the psychometric properties of a scale to measure medical students' career-related values. *Academic Medicine, 76*, 157 - 165.
- Nevill, D. D., & Super, D. E. (1986). *The values scale: Theory, application, and research*. Palo Alto, CA: Consulting Psychologists Press.
- Oudshoorn, W. C. (2003). The utility of Canadian DAT perceptual ability and carving dexterity scores as predictors of psychomotor performance in the first-year of operative dentistry. *Journal of Dental Education, 67*, 1201 - 1208.
- Poole, A., Catano, V., & Cunningham, D. (2007). Predicting performance in Canadian dental schools: The new CDA structured interview, a new personality assessment, and the DAT. *Journal of Dental Education, 71*, 664 - 676.
- Ranney, R., Wilson, M., & Bennett, R. (2005). Evaluation of applicants to predoctoral education programs: Review of the literature. *Journal of Dental Education, 69*, 1095 - 1105.
- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The Big Five personality factors and personal values. *Personality and Social Psychology Bulletin, 28*, 789 - 801.

- Sandow, P., Jones, A., Peeh, C., Courts, F., & Watson, R. (2002). Correlation of admission criteria with dental school performance and attrition. *Journal of Dental Education, 66*, 385 - 392.
- Schwartz, S. (1994). Are there universal aspects in the structure and contents of human values? *Journal of Social Issues, 50*, 19 - 45.
- Silberman, S. (1976a). Comparison of personal values among freshman and senior dental students and dental faculty. *Journal of Dental Education, 40*, 334 - 339.
- Silberman, S. (1976b). Standardization of value profiles of dental students and dental faculty. *Journal of Dental Research, 55*, 939 - 950.
- Silberman, S. L. (1976a). Comparison of personal values among freshman and senior dental students and dental faculty. *Journal of Dental Education, 40*, 334 - 339.
- Silberman, S. L. (1976b). Standardization of value profiles of dental students and dental faculty. *Journal of Dental Research, 55*, 939 - 950.
- Smithers, S., Catano, V. M., & Cunningham, D. P. (2004). What predicts performance in Canadian dental schools? *Journal of Dental Education, 68*, 598 - 613.
- Tabachnick, B., & Fidell, L. (2007). *Using Multivariate Statistics* (5th ed.). Toronto: Allyn and Bacon.
- Thompson, G. W., Ahlawat, K., & Buie, R. (1979). Evaluation of the dental aptitude test components as predictors of dental school performance. *Journal of the Canadian Dental Association, 45*, 407 - 409.

Appendix A

Initial Dentists' Values Survey

Directions provided to respondents: *The following survey contains a number of statements related to your career as a dentist. Each sentence begins with the phrase "In my work as a dentist, it is now or will be important that...." Please indicate the extent to which you agree or disagree with each of the statements below. Response options: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree.*

- | | |
|-------------------------------------------------------|-------------------------------------------------|
| 1. I am open-minded | 14. I carry out my work conscientiously |
| 2. I provide the best possible care to my patients | 15. I am honest |
| 3. I maintain independence | 16. I am satisfied with my life outside of work |
| 4. I am benevolent | 17. I am happy |
| 5. I am ambitious | 18. I am loyal |
| 6. I am able to spend time with my family and friends | 19. I am a rational thinker |
| 7. I work with my hands | 20. I behave ethically |
| 8. I have harmony in my life | 21. I have control over my work life |
| 9. Patient relations are a priority | 22. I am dependable |
| 10. I am comfortable with who I am | 23. I am sincere |
| 11. I display cultural sensitivity | 24. I am satisfied with my work/career |
| 12. I have a social conscience | 25. I achieve personal satisfaction |
| 13. I have autonomy in how I carry out my work | 26. I am not focused on money |
| | 27. I am practical |
| | 28. I am accepting of everyone |

29. I achieve financial stability
30. I have freedom to make my own decisions
31. I am detail oriented
32. I maintain integrity (in my profession)
33. My job is enjoyable
34. I get to use my hands in a helpful way
35. I am competent
36. I possess intellectual skills
37. I am analytical
38. I am aware of the values of different cultures
39. I earn a good living
40. I display empathy toward my patients
41. I am a perfectionist
42. I belong to a respected profession
43. I am creative
44. I am capable to carry out my work
45. I am logical
46. I am kind to others
47. I demonstrate professionalism
48. I am well paid
49. I am caring
50. I maintain my own personal health
51. I respect others
52. I have artistic ability
53. I am flexible
54. I have excellent technical skills
55. I am understanding
56. I am involved in my community
57. My lifestyle is comfortable
58. I am able to help others
59. I am responsible
60. I have quality time away from work
61. I have self-respect
62. I have the ability to cope with difficult situations
63. I have an exceptional clinical education
64. I am considerate
65. I am helpful to society
66. I maintain financial security
67. I behave compassionately
68. I am a hard worker
69. I have a high quality of life
70. I have confidence in myself

71. My quality of work is high
72. I provide healthcare to others
73. I am committed to continual learning
74. My work brings me pleasure
75. All patients have access to affordable
dentistry
76. I earn a reasonable income
77. I am devoted to my job
78. My life is enjoyable
79. I achieve prestige
80. I work with a variety of patients
81. My work is related to the medical field
82. I recognize the value in other people
83. I find joy in my life
84. I am my own boss
85. I am sensitive toward others
86. I persevere in difficult times
87. I am successful (in my career)
88. I achieve work-life balance
89. I accept others despite their flaws
90. I am able to work with people
91. I am pleased by the work I do

Appendix B

Dentist Recruitment Email

Dentists Needed to Fill Out Survey

Angela Langille, a graduate student from the department of psychology at Saint Mary's University in Halifax, Nova Scotia, is asking Canadian dentists to participate in her master's thesis research on dentists' values. She is conducting this research under the supervision of Dr. Tom Boran, Dalhousie University and Dr. Vic Catano, St. Mary's University.

Access the short survey from CDA's website.

Appendix C

Informed Consent Form, Study 1

Informed Consent Form**Dentist's Values****Angela Langille****Department of Psychology****Saint Mary's University****Halifax, NS B3H 3C3****Phone: (902) 420-5862; Email: angela.langille@smu.ca**

I am graduate student in the Department of Psychology at Saint Mary's University. As part of my master's thesis, I am conducting research under the supervision of Dr. Vic Catano and Dr. Tom Boran, and I am inviting you to participate in my study. The purpose of the study is to create an instrument that will accurately determine dentists' values. The results of this study should help decision makers and researchers who are interested in measuring values related to the dental profession.

This study involves completing online surveys related to values. By completing the surveys online and clicking the 'submit' button upon completion, you are indicating that you fully understand the information provided on this information sheet and agree to participate in this study. This study should take approximately **15 minutes** to complete.

Your participation is completely voluntary. You may withdraw from this study at any time without penalty. You may withdraw from this study until you submit your completed survey. At that time, it will be impossible to distinguish your responses from those of other participants. All information obtained in this study will be kept

strictly **confidential and anonymous**. We will not be able to identify how you responded to this survey. Results of this study will be examined and reported at the group level, and no individual participants will be identified. Please do not put any identifying information on the surveys.

If you have any questions, please contact the student researcher, Angela Langille, at (902) 420-5862 or angela.langille@smu.ca. You may also contact Dr. Vic Catano at (902) 420-5845 or vic.catano@smu.ca.

This research has been reviewed and approved by the Saint Mary's University Research Ethics Board. If you have any questions or concerns about the study, you may contact Dr. Veronica Stinson, Chair of the Saint Mary's University Research Ethics Board at ethics@smu.ca or 420-5728.

Please read this information form carefully. By completing the survey online you are indicating that you understand the information provided in this form and agree to participate in this study.

Please keep one copy of this form for your own records.

Appendix D

Schwartz Value Survey

Directions provided to respondents: *The survey below contains a number of words describing principles people use to guide their behaviour. Please use the rating scale provided to indicate the extent to which these words are guiding principles in your life.*

Response options: *Opposed to my values, Of Minimal Importance, Somewhat Important, Of Supreme Importance.*

- | | | |
|------------------------------------|---------------------------------|--------------------------------|
| 1. Equality | 17. Moderate | 32. Social power |
| 2. Preserving public image | 18. Independent | 33. Authority |
| 3. Accepting one's portion in life | 19. Self-discipline | 34. Clean |
| 4. Ambitious | 20. Social justice | 35. Freedom |
| 5. World at peace | 21. Obedient | 36. Protecting the environment |
| 6. Influential | 22. Enjoying life | 37. Helpful |
| 7. Choosing own goals | 23. Forgiving | 38. Social order |
| 8. Devout | 24. Self-indulgent | 39. Daring |
| 9. Unity with nature | 25. Humble | 40. Reciprocation of favours |
| 10. Pleasure | 26. Honoring parents and elders | 41. Varied life |
| 11. Politeness | 27. Exciting life | 42. Family security |
| 12. Capable | 28. Respectful | 43. Loyal |
| 13. Wisdom | 29. Wealth | 44. National security |
| 14. Curious | 30. Broadminded | 45. Responsible |
| 15. Successful | 31. Creativity | 46. Honest |
| 16. World of beauty | | |

Appendix E

Mini-International Personality Item Pool

Directions provided to respondents: *The following survey contains a number of phrases describing people's behaviours. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.*

Response options: *Very Accurate, Moderately Accurate, neither Inaccurate nor Accurate, Moderately Inaccurate, Very Accurate.*

- | | |
|----------------------------------------------------------|--------------------------------------------------|
| 1. Am the life of the party | 12. Feel others' emotions |
| 2. Sympathize with others' feelings | 13. Like order |
| 3. Get chores done right away | 14. Get upset easily |
| 4. Have frequent mood swings | 15. Have difficulty understanding abstract ideas |
| 5. Have a vivid imagination | 16. Keep in the background |
| 6. Don't talk a lot | 17. Am not really interested in others |
| 7. Am not interested in other people's problems | 18. Make a mess of things |
| 8. Often forget to put things back in their proper place | 19. Seldom feel blue |
| 9. Am relaxed most of the time | 20. Do not have a good imagination |
| 10. Am not interested in abstract ideas | |
| 11. Talk to a lot of different people at parties | |

Appendix F

Dental Student Recruitment Email 1

Dear D.D.S Students,

I am graduate student in the Department of Psychology at Saint Mary's University. As part of my Masters thesis, I am conducting research under the supervision of Dr. Boran (Dalhousie University), Dr. Catano (St. Mary's University), Dr. Cunningham (Dalhousie University), and Dr. Cleghorn (Dalhousie University). The purpose of the current study is to determine the relationship between dentists' and dental students' values. The results of this study should help decision makers and researchers who are interested in measuring and studying values related to the dental profession.

In approximately two days, you will receive an email containing an attached Informed Consent Form and a short survey. Should you wish to participate in the study, complete the survey and return it to me at angela.langille@smu.ca.

Your participation is greatly appreciated, If you have any questions please contact Angela Langille at angela.langille@smu.ca.

Sincerely,

Angela Langille

Appendix G

Informed Consent Form, Study 2

Department of Psychology
Saint Mary's University
923 Robie St.
Halifax, Nova Scotia
Canada B3H 3C3

Faculty of Dentistry
Dalhousie University
5981 University Avenue
Halifax, Nova Scotia
Canada B3H 1W2

Informed Consent Form

Title of Project: Development and Validation of the Dentists' Values Scale: Study 2

Contact Person

Participants in this study are encouraged to contact Angela Langille in the event of any unusual occurrences or difficulties related to this research project, or to receive more information or clarification about the study procedure at any time. Angela Langille can be reached at (902) 420- 5862 or by email at angela.langille@smu.ca. You may also contact Dr. Tom Boran at (902) 494-1911 or thomas.boran@dal.ca.

Introduction

We invite you to take part in a research study at the Faculty of Dentistry. Taking part in this study is completely voluntary. You may withdraw from the study at any time without penalty. Your performance as a student and your progress in the dental program will not be affected in any way by whether you participate or not in this study. The study is described below. This description tells you about the risks, inconvenience, or discomfort you might experience. Participating in this study will not benefit you, but we might learn things that will benefit others. As indicated above, you should discuss any questions you have about this study with Angela Langille or Dr. Tom Boran.

Purpose of Study

The purpose of this study is to use a newly developed a scale to determine the relationship between values of dentists and dental students.

Study Design

This study will look at the relationship between values of dentists and dental students.

The data used in this study will be collected via email survey.

Who Can Participate in the Study

Any student in the four-year D.D.S. program may participate in this study.

Who Will be Conducting the Research

The Principle Investigator and Co-Investigators named above will conduct the study.

Angela Langille is a graduate student at Saint Mary's University and this research will constitute part of her Masters thesis project. Dr. Boran is the Assistant Dean of the Faculty of Dentistry at Dalhousie University. Dr. Catano is a Psychologist employed at Saint Mary's University. Dr. Cleghorn is a dentist and faculty member at Dalhousie University. Dr. Cunningham a faculty member at Dalhousie University.

What You Will be Asked to Do

You will be asked to complete a survey relating to values, or principles that guide one's behaviour. We will also ask you to permit us to use the data from this survey as part of this study. The survey should take approximately 10 minutes to complete.

Possible Risks and Discomforts

There are no adverse events or side effects anticipated with participation in this study.

There are no known or perceived risks to you health, safety, or welfare by participating in this study. However, it is possible that you might experience mild discomfort in reflecting

on your values. If you feel discomfort for any reason you are free to withdraw from the study without penalty.

Possible Benefits

You will not benefit directly from participation in this study.

Compensation

You will not be paid or receive any other compensation for participating in this study.

Confidentiality

You will not be identified in any reports or publications and the dataset will not contain any personal identifiers. All data will be grouped together and only the group statistics will be reported. The database will be under secure control of the Principal Investigator.

This data will only be seen by the investigators and will not be used in any way to evaluate your performance as part of the dental program nor will it have any effect on your progress in the program. Do not put any identifying information on the survey. After you submit your survey, it will be impossible to distinguish your data from other participants' data. When the study is finished the data will remain in the possession of the Principle Investigator for 5 years post-publication. The data will be stored electronically and will not contain any identifying information.

Questions

If you have any questions about participating in this study, now or in the future, please address those questions to one of the contact persons listed above.

Summary

Please keep a copy of this consent form for your records. As well, at the end of the study a report will be available to all participants. If you would like a copy of that report, please

email, fax, or telephone the Principle Investigator and we will send you an electronic summary of the results of the study when it is complete.

Termination

You may terminate your participation in this study at any time and for any reason until you submit the survey. Once you submit your survey, we cannot distinguish your answers from other participants' answers. Termination will have no effect on the evaluation of your performance as a student in the faculty of dentistry or your progress in the program.

Problems or Concerns

In the event that you have any problems or difficulties with, or wish to voice concern about and aspect of your participation in this study, you may contact the Human Research Ethics/Integrity Coordinator at Dalhousie University's office of Human Research Ethics and Integrity for assistance: (902) 494-1462.

Title of Project: Construction and Validation of the Dentists' Values Scale: Study 2

Consent

By completing and submitting the survey, you are indicating that you have read the explanation about this study. You agree that you have been given opportunity to discuss the study and have any questions answered to your satisfaction. **By completing and submitting the survey, you consent to take part in this study.** However, you realize that your participation is voluntary and you are free to withdraw from the study at any time until you submit the survey. Print a copy of this consent form to keep for your own records.

Appendix H

Dental Student Recruitment Email 2

Dear D.D.S. Students,

As indicated by my previous email, I am a Masters student from St. Mary's University and as part of my thesis I am researching dentists' values. You are invited to participate in my research. Attached is an Informed Consent Form and short survey. Should you wish to participate in the research after reading the Informed Consent Form, complete and return the attached survey to me at angela.langille@smu.ca. You will receive a reminder email about the survey in approximately one week.

Thank you for your participation. If you have any questions please contact Angela Langille at angela.langille@smu.ca.

Sincerely,

Angela Langille

Appendix I

Dental Student Recruitment Email 3

Dear D.D.S. Students,

As a follow-up to my previous emails, I am inviting you to participate in my research on dentists' values. If you wish to participate and have not already done so, please read the attached Informed Consent Form and complete and return the survey to angela.langille@smu.ca.

Thank you for your participation. If you have any questions please contact Angela Langille at angela.langille@smu.ca. Please disregard this message if you have already completed the survey or if you do not wish to participate in the study.

Sincerely,

Angela Langille

Appendix J

Dental Student Recruitment Email 4

Dear D.D.S. Students,

As a follow-up to my previous emails, I am inviting you to participate in research on dentists' values. If you wish to participate and have not already done so, I am offering you another opportunity to complete the values survey.

On [DATE] at [TIME], you will have the opportunity to complete the short survey in the dental building in room. At approximately [TIME], after you finish the survey, we will draw for prizes. Following the draw, you are invited to the third floor student lounge for pizza.

The draw is for three gift cards from Chapters (1 x \$100 gift card and 2 x \$50 gift cards). Everyone who participates in the study will be eligible to receive one of these prizes.

If you have already completed the survey and returned it by email, you are eligible to win one of the prizes and are welcome to come for pizza. Just join us in room 3156 shortly after [TIME] on [DATE] for the draw. **YOU DO NOT NEED TO COMPLETE THE SURVEY AGAIN.**

If you wish to participate in the research but are unavailable on [DATE], complete the attached survey and return it to me at angela.langille@smu.ca. Also, to ensure you are entered into the draw, send me an email with your name and contact information.

Thank you for your participation. If you have any questions please contact Angela Langille at angela.langille@smu.ca.

Sincerely,

Angela Langille



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Research Ethics Board Certificate Notice

The Saint Mary's University Research Ethics Board has issued an REB certificate related to this thesis. The certificate number is: 07-177

A copy of the certificate is on file at:

Saint Mary's University, Archives
Patrick Power Library
Halifax, NS
B3H 3C3

Email: archives@smu.ca

Phone: 902-420-5508

Fax: 902-420-5561

For more information on the issuing of REB certificates, you can contact the Research Ethics Board at 902-420-5728/ ethics@smu.ca.