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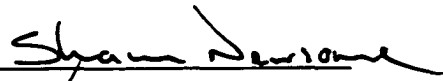Running Head: Predicting Success in a Dental Training Program

Predicting Success in a Dental Training Program

A Thesis Submitted in Partial Fulfillment of the

Requirement for the Degree of Masters of Science in

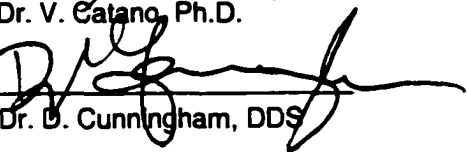Applied Psychology (Industrial/Organizational)

Saint Mary's University

Halifax, Nova Scotia

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Approved: _____

Dr. S. Newsome, Ph.D.

Approved: _____

Dr. V. Catano, Ph.D.

Approved: _____

Dr. B. Cunningham, DDS

Date: September, 2001

0-612-65745-0

Canada

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Acknowledgements

Who do you thank at the end of such a very long road and can you even put that thanks into words? I consider so many people when I think of this journey.

First and foremost I thank my mother. For her incredible devotion to my children, her praise and her unending love. I would never have been able to even consider doing this without her and for that I thank her.

To my very special advisor, Dr. Shaun Newsome. For being an incredible mentor and guiding force. Mere words will never convey the gratitude I feel towards him for believing in me.

To Dr. Victor Catano who never ever hesitated to give me advice and support. I especially thank him for his calm exterior that always made the situation seem brighter.

To an extraordinary individual, Dr. Don Cunningham for being my coach, teammate and cheerleader all in one. He was a constant source of wisdom and I am forever in his debt for all he has taught me.

To Dr. Kevin Kelloway for agreeing to be my external committee member on such short notice.

To two very special people Mia Ashkewe and Martin Royal. We started this together and we finished it. I thank Mia for her precious friendship, for her never ending words of encouragement and for the flashlight that she always had handy to help us get to the light at the end of the tunnel. To Martin for sharing so many moments of laughter with me, especially to and from Stellarton. We made it!!

Finally and most importantly I thank my own little family who have watched me go through so much in the past three years. I thank my husband Dwayne simply for his love, for pushing me in a way that no one else can, and inspiring me to reach for the stars. And of course there are my children to thank. My two little girls Paige and Caila, for giving me the love that only a child can give a mother.

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Abstract

The task of selecting dental applicants who are the most likely to excel out of an extremely competitive applicant pool is a problem faced annually by dental faculties. This study examined the validity of both cognitive and non-cognitive factors used for selection to Canadian dental schools. In particular, the study examined the validity of the interview and the Dental Aptitude Test in the prediction of dental training success.

Interest in personality measurement and the prediction offered by personality measures has escalated and may be applied to the selection of dental candidates. Therefore, the study also assessed whether the addition of a personality measure would increase the validity of predicting performance beyond that achieved by an interview and the Dental Aptitude Test.

Results suggest that the interview may be counterproductive to good decision making in the selection process. Consistent with previous research, results show that the Dental Aptitude Test is a good predictor of academic work with prediction declining when clinical components are introduced. Concerning the prediction offered by the personality measures, results indicated that Openness to Experience was significantly related to aspects of clinical training. Contrary to expectations this relationship was negative. Results further indicated that narrow personality traits of the broad factors may supply admissions officers with more information than the broader factors and that they are better at predicting clinical components of dental training. Implications of the findings are discussed and recommendations regarding the admission process to Canadian dental programs are offered.

INTRODUCTION

The utility of personality measures in the selection process has interested researchers for many decades (Guion & Gottier, 1965). However, only recently have personality measures become more useful in personnel selection procedures (Barrick & Mount, 1991; Salgado, 1998; Tett, Jackson, & Rothstein 1991;). Using personality measures for selection purposes may result in positive consequences such as selecting workers that are more conscientious and more open to new experiences. Such selection processes may not only apply to the selection of employees, but may also include selection of students to professional programs in dentistry and medicine.

Faculties of Dentistry in Canada are faced with the annual task of selecting dental applicants that are most likely to excel out of an extremely competitive applicant pool. Currently the decisions to accept or turn away candidates are traditionally based upon several factors that include academic achievement, a measure of cognitive ability, reference letters, an application, and an interview. An important factor that is often missing from this selection battery is an assessment of a non-cognitive variable such as personality. A selection process based upon both cognitive and non-cognitive factors may improve the prediction of success in dental school candidates.

In addition to selecting dental candidates for particular strengths, personality, a non-cognitive factor, may also aid in the prediction of performance by providing incremental validity to selection procedures such as interviews and cognitive testing. Significant increases in validity achieved through the addition

of personality variables, may also aid in the identification of dental applicants with the highest probability of performing well.

The decisions that admissions officers make concerning dental student admission must be based on selection systems that are both valid and reliable. The purpose of the present study is to examine the validity of both cognitive and non-cognitive factors used for selection to Canadian dental schools. In particular the study will examine the validity of the interview and the Dental Aptitude Test in the prediction of student success. The study will also assess whether the addition of a personality variable will increase the validity of predicting performance beyond that achieved by measures of cognitive ability and an interview.

Interviews and Selection

Interviews are the most widely used method for personnel selection and for the selection of applicants to all types of higher education (Edwards, Johnson, & Molider, 1990). Selection interviews are generally used to allow organizations and professional programs, such as dentistry, the opportunity to develop a personal impression of an applicant. They also enable an interviewer to verify the authenticity of other data that has been gathered on an applicant elsewhere in the application process (Schwind, Das, Werther, & Davis, 1995). More importantly, interviews help an interviewer to infer if a candidate has the necessary knowledge, skills, abilities and interests that are required for success in a targeted position (Edder & Harris, 1999).

There are many different types of interviews all of which can be conducted in various ways. For example, interviews can be structured in the sense that they have predetermined questions and answers. Conversely, interviews can lack structure. In an unstructured interview, a number of candidates can be asked different questions which may or may not be accompanied by a rating scale (Edder & Harris, 1999). Interviews can also vary in their level of structure (Catano, Cronshaw, Wiesner, Hackett, & Methot, 2000). Another type of interview is the Behaviorally Based Interview, which is derived from a job analysis and is based on the premise that past performance will predict future performance (Janz, Hellervik & Gilmore, 1986). Furthermore, different types of interviews can be conducted with one interviewer or a panel of interviewers.

Different types of interviews also have varying degrees of validity and the level of structure that an interview possesses appears to be a moderator of its predictive validity. For instance, structured interviews have superior levels of validity to those that are not structured (Huffcutt & Arthur, 1994). The estimated validity of interviews that are not structured has been reported to be as low as .14; the validity of those that are structured and based on job analysis procedures tend to be as high as .60 (Janz, Hellervik & Gilmore, 1986). Validity will also increase to the degree that the interview questions are related to the content of the job (McDaniel, Whetzel, Schmidt & Maurer, 1994; Wiesner & Cronshaw, 1988). In addition, interviews with scales that provide detailed information for the evaluation of responses are associated with much higher levels of validity than those lacking predetermined answers (Wright, Lichtenfels, and Pursell, 1989).

Furthermore, an interview that is conducted with a panel of interviewers adds little to its validity (Huffcutt & Woehtr, 1999).

Interviews and Dental Student Selection

Research examining the interview in the admissions process to professional schools such as medicine and dentistry, has led to different conclusions. Taylor (1990) believes that the admissions interview is too costly to administer. Conversely, Powis, Neame, Bristow and Murphy (1988) advocate its use and conclude that it is beneficial in determining who will perform well in professional programs of study. Lower interview scores were associated with those students who withdrew or did not complete their training in medical school (Powis, Bristow, Waring, & O'Connell, 1992). Lack of agreement on the use of the interview in the admissions process may result from the use of different interview formats at various schools of study.

The Canadian Dental Association's Interview

The interview used for admission to Canadian dental school is a critical component of the admissions process in over seventy percent of schools across Canada (Canadian Admissions Criteria, 1997). Despite this there is a lack of research regarding its validity.

The interview for selection to dental school in Canada was developed in the late seventies by the Dental Aptitude Test committee of the Council of Education of the Canadian Dental Association. The committee examined interview literature to determine the characteristics that were commonly assessed in an interview. With the assistance of a psychometric consultant from the

University of Michigan, eight characteristics were identified and defined. Faculty and students in Dental School at the University of British Columbia reviewed and evaluated the eight characteristics. This process led to all eight characteristics being included in the interview. The committee then developed questions that would elicit responses to assess these characteristics. The interview also included a checklist of other observations such as personal appearance, shyness, and articulateness. The interview was implemented during the 1980 admission cycle. Final selection of students was heavily weighted toward applicants who scored high on the interview (Graham & Boyd, 1982).

The characteristics that the dental admission interview attempts to assess include motivation, ability to relate, adaptability, self-appraisal, maturity, attitudes, problem exploration, and sense of responsibility. There is also a "gut feel" component in the interview based on the interviewers' perception of the interviewee. Interviewers establish their own criteria for rating the response of the applicant; a scoring key does not accompany the questions. There are however guidelines that aid in evaluating responses that include consistency of response, depth of understanding, conviction, absence of social desirability, and conceptualization of questions. Presence or absence of the desired characteristics are rated on a five-point scale. It is possible to obtain a total of five points on each subscale of the interview with the highest possible score being 40. The interview is usually conducted with a panel of two to three interviewers and takes approximately 45 minutes. The inter-rater reliability of the interview ranges from 0.83 to 0.87 (Graham and Boyd 1982).

Knowledge of whether or not an important component of a selection system is useful in adequately predicting who will perform well is essential. The Canadian Dental School interview wasn't derived from procedures that are thought to increase the validity of an interview. There are no rating scales to accompany each question, nor is the content of the questions related to success in dental practice or to what dental students may actually do in the program. The current study will examine the role that the interview plays in the selection of dental candidates to Canadian Dental schools. The incremental validity of the interview will be assessed to determine if it makes a unique contribution to the prediction of performance. Based on the construction of the dental interview, it is expected that at most the interview will have low validity as a predictor of dental school performance in either the clinical or academic portions of the dental school curriculum.

General Mental Ability and Selection

General Mental Ability is a valid predictor for many aspects of both job and training performance in a wide variety of positions (Hunter & Hunter, 1984; Ree, Earles, & Teachout, 1994; Reilly & Chao, 1982; Schmidt & Hunter, 1998). Interest in the relationship between general mental ability and job performance has continued for many years. For instance cognitive ability testing dates back to World War I and beyond. During World War I, the U.S. army launched the first large-scale cognitive ability test. Army recruits were tested to determine their suitability for service. Those that were viewed as being unfit for service were screened out while those who were not unfit were placed in various positions

based on their cognitive abilities. This testing program was viewed as successful and served as a guide for other large-scale cognitive ability tests that followed (Childs, Baughman, & Keil, 1997). The ease with which these tests are administered and scored has likely resulted in their increased use in the selection process both for educational and employment purposes (Cortina, Goldstein, Payne, Davison, & Gilliand, 2000).

Measures of general mental ability predict performance in a wide variety of academic settings (Gough & Wallace, 1964). In a report summarizing past research on the validity and utility of selection methods in personnel psychology, Schmidt and Hunter (1998) concluded that the most valid predictor of future performance and learning is general mental ability with a mean validity of .51. When combined with other selection procedures, including an interview, integrity tests, and a measure of personality, general mental ability consistently predicted performance above and beyond the validity offered by other measures.

General Mental Ability and Dental Student Selection

Those who possess high general mental ability are superior problem solvers, acquire knowledge quickly, and excel in abstract thinking (Schmidt & Hunter, 1998). These aspects of performance would be advantageous to possess in professional schools such as dentistry because of the vast amount of knowledge that a dental student is required to learn in a relatively short period of time. Individuals with higher general mental ability will have superior performance, as they are likely to acquire dental knowledge more rapidly and apply these skills with ease practically.

One measure of cognitive ability that is used for admission to Canadian Dental Programs is the Dental Aptitude Test (DAT). It is common practice to use aptitude tests such as the DAT as a proxy for cognitive ability tests to decide which students will be admitted into dental school. This is because there is little difference between how the terms ability and aptitude are defined. For example, the term ability refers to an individual's characteristic that contributes to learning or performance, in other words aptitude (Whetzel & Wheaton, 1997, pg.144)[1].

The Dental Aptitude Test

In 1967, the Canadian Dental Association instituted the Dental Aptitude Test program in Canada (Boyd, Teteruck, and Thompson, 1987). This initiative arose from the need to have additional scientific data to base admission decisions upon and to assist in determining which students possess the highest degree of intellectual ability (Thompson, Ahlawat, & Buie, 1979). There are four major components included in the DAT, the Survey of Natural Science Examination, the Reading Comprehension Examination in the Dental Sciences, the Perceptual Motor Ability Test, and the Carving Dexterity test.

The Survey of Natural Science Examination is an achievement test that contains forty items of biology-based material and thirty items of inorganic or general chemistry. Biology questions are based on knowledge in cell structure as well as function, life and its characteristics, the animal kingdom, human anatomy

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1. The Oxford English Dictionary provides very similar definitions for both ability and aptitude. For example, ability is defined as; a capacity or talent whereas aptitude is defined as; a natural propensity or talent.

and physiology, reproduction and development, genetics, evolution, and ecology. General chemistry questions are based on knowledge in nature of matter and measurement, stiochiometry, gases, atomic structure, liquids and solids, chemical equilibrium, rates of reaction and kinetics, thermodynamics and solutions, oxidation-reduction reactions, quantum mechanics, periodic properties, and nuclear reactions (Canadian Dental Association, 1998).

The Reading Comprehension Examination is a test that consists of a reading passage that contains approximately 4,000 words. The subject matter inherent in the passage contains material that is not typically covered in undergraduate education and involves some aspect of basic dental and clinical science. Students must then answer 50 items that cover concepts that were introduced in the passage. The idea of the test is to simulate a learning situation that would be encountered in dental school reading assignments (Canadian Dental Association, 1998).

The Perceptual Motor Ability Test consists of 90 non-verbal perceptual types of test items that measure both two and three-dimensional perceptual ability. Items incorporate line and angle discrimination, block counting, space relationship, and object visualization.

The final component of the DAT is called the Carving Dexterity Test. This is different from other tests on the examination because it is a manual performance test. Applicants are offered a number of items; a piece of chalk, a ruler, and a knife and are then instructed to carve a figure. This test measures an

applicant's ability to follow directions and to visualize in three dimensions. It is also an assessment of an applicant's manual dexterity (Graham & Boyd, 1979).

The DAT is a current requirement of admission at all ten Canadian dental schools and may also be recognized by American dental schools as an alternative to the American Admission Test. Students who complete the DAT are compared against one another rather than on the amount of material that they master through the course of the examination. Score scales range from 1 to 30 with 15 being the median point and there are no penalties for guessing as scores are based on the number of correct responses (Canadian Dental Association, 1998).

The validity of the DAT for admissions purposes has been addressed in a number of studies. For instance, dental students who are admitted into study based on DAT scores do significantly better than those students whose acceptance is based on other factors (Thompson, Ahlawat, & Buie, 1979). In addition, Kramer (1986) found support for the use of the DAT in predicting dental school performance in academic components in the first two years of dental training. Many DAT scores also correlate with grades in theory courses in dental school (Dworkin, 1970).

The DAT can provide admissions committees with information that will aid in decision-making tasks. It would be beneficial if the DAT continued to play an integral role in the selection process of Canadian Dental Schools. The history of cognitive ability testing also lends support for use of the DAT in selection processes. It is expected that the DAT, which is a measure of general mental ability, will aid in the prediction of dental student success.

In the early phases of DAT administration a personality component was part of the test. This section was eliminated from the test during the period when the use of personality for selection purposes was subject to considerable debate. Current meta-analytic reviews have been more supportive to the use of personality tests in selection (Barrick and Mount, 1991; Tett, Jackson, & Rothstein, 1991).

Personality and Selection

Non-cognitive factors, such as personality measures predict success in various educational settings and provide useful information for the selection of students in various programs of study (Bartram & Dale, 1982;Gough & Wallace, 1964; Harrell & Harrell, 1973; Jones, Courts, Sando & Watson, 1997). For example, successful military pilots have distinct personality characteristics that are significantly different than those of the general population (Bartram and Dale 1982). Business students who reach general management positions earlier in their careers tend to be more socially extraverted and to desire higher levels of independence and autonomy (Harrell & Harrell, 1973). Student nurses who are more tolerant of ambiguity tend to have higher grades at the end of their training programs than those who are less tolerant (Bruhn, Bunce & Greaser, 1978). Dental students tend to show characteristics that are different from those of students in business, social work, engineering and medicine (Silberman, 1982). Based on these findings, personality may be an important factor that could aid in the prediction of success in many academic programs.

Personality and Dental Student Selection

Many admissions officers responsible for the selection of dental school candidates believe that high academic potential is not the only requirement that determines if a candidate will perform well in a dental program or become a successful practitioner. For instance, caring abilities and time management skills seem to play a role in being perceived as a good dentist (Reddick & Macfarlane, 1998). While introverted dental students may perform better than extraverted students in understanding theories and ideas, extraverts prefer social interaction and may demonstrate superior communication skills in clinical components in dental programs (Westerman, Grandy, Erskine & Turner, 1989).

Dental faculty members have also rated non-cognitive qualities such as recognizing personal limitations and possessing high ethical standards as being relevant for success in the dental profession (Reid, Fish & Cowan, 1972). In a recent study conducted for the Canadian Dental Association, eight non-cognitive competencies were identified and deemed pertinent for success in the dental profession through the use of the Hilson Job Analysis Questionnaire (HJAQ) with focus groups that included both dentists and patients. The HJAQ is a structured questionnaire that aids in the identification of personality characteristics that are required for success in an occupation. The identified characteristics included many that could be characterized as personality traits. The competencies were: sensitivity to others, tact and diplomacy, oral communication, integrity, judgment and analysis, conscientiousness, and life long learning (Tomini & Keown, 1998). Assessing applicants for personality characteristics that are considered desirable

for the dental profession may lead to improvements in the selection process, particularly predicting success in more clinical aspects of the program. One could argue that those that possess certain personality traits will outperform those that do not in clinical work.

Researchers have expressed an interest in the relationship between personality and dental school performance for many years. This interest stems from the view that students with various personality types may differ in how they will perform throughout their dental training. For instance, Westerman, Grandy, Erskine, and Turner, (1989) demonstrated that over 90 percent of students who dropped out of dental school exhibited the same personality type. Recently, Jones, Courts, Sandow, and Watson (1997) used the Myers Briggs Type Indicator (MBTI) to examine the correlates of personality preferences and dental school performance. Introverts were more likely to experience difficulties than extraverts in the clinical components of the program. Conversely, introverted students outperformed the extraverted students in the academic component of the curriculum. In the same study, "judging and sensing" dental students received a higher class ranking over their four years of schooling than those students who were not identified as this personality type.

Researchers have also assessed the personality characteristics of dental students longitudinally to examine any differences in character that might occur over the four years of dental training. For instance, dental students become more organized, conscientious and punctual as they progress through their dental training (Mcreary & Gershen, 1982). As well, dental students become more

independent over time and become more personalistic (Vinton, 1978). In a

longitudinal study Loupe, Meskin and Mast (1978) demonstrated that dental

students became less interested in leadership roles after graduation from dental

school. These findings suggest that certain characteristics that a dental student

possesses going into training may not be the same as the ones they possess

following training.

The majority of the research related to dental school performance and

personality is descriptive in nature and relies on measures of personality that may

not be suitable for the purpose of admission decisions. For instance, The Myers

Briggs Type Indicator (MBTI) may not have relevance in predicting performance

in dental school and may be more suited to teambuilding and career development

rather than selection procedures (Barger & Kirby, 1995). An alternative

personality measure that assesses personality characteristics, the Five Factor

Model of Personality, may provide admissions officers with more informative

data.

<u>The Five-Factor Model of Personality</u>

The Five Factor Model of personality (FFM) is a universal template that

can be used for understanding the structure of personality (Goldberg, 1993). This

useful taxonomy is comprised of the dimensions of Neuroticism (the tendency to

experience negative affect, such as anxiety, depression, and hostility),

Extraversion (the quantity and intensity of interpersonal interaction), Openness

(the proactive seeking and appreciation of new experiences), Agreeableness (the

quality of one's interpersonal interactions along a continuum from compassion to

antagonism), and Conscientiousness (the amount of persistence, organization, and motivation in goal directed behaviors) (Piedmont & Weinstein, 1994; Costa & McCrae, 1992). The emergence of the Five Factor Model of personality aids in the classification of personality measures, and eliminates terminological confusion (Hogan, Hogan, & Roberts, 1996).

Early Big Five research in the workplace organized personality related information into the Big Five dimensions to aid in the prediction of job and training performance (Barrick &Mount, 1991; Day & Silverman, 1989; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990). Barrick and Mount (1991) conducted a meta-analysis based on 35 years of personality research to examine the relationship between the Big Five personality dimensions and job performance criteria of job proficiency, training proficiency, and personnel data for five different occupations. Personality was an important predictor of job performance for all occupational groups. In a similar study, Tett, Jackson, and Rothstein (1991) clustered scales from different personality inventories into five major personality constructs similar to the Big Five and found a similar relationship between these personality constructs and performance. They concluded that personality measures are an invaluable tool in the selection process.

Big Five Factors and Dental Student Selection

Two Big Five Factors, Openness to Experience and Conscientiousness, may be of particular interest to the prediction of performance in dental training. These two factors appear to be related to intellect and academic achievement (Costa & McCrae, 1992). Time management behaviors such as setting goals and

preference for organization are similar to facets of the Big Five factor of

Conscientiousness and are behaviors that are related to first year dental grades

(Mace and Tira, 1999). Conscientious individuals are likely to exert more effort

on tasks and possess higher levels of organizational skills (Schmidt & Hunter,

1998). These are skills that would be beneficial to possess in a highly taxing

dental training environment. Highly conscientious students are also more likely

to set and achieve goals, which makes them likely to perform better than others

(Barrick, Mount & Strauss, 1993). Individuals that score high on

Conscientiousness also exhibit superior performance in jobs, like dentistry, that

involve personal interaction in clinical settings (Barrick & Mount, 1998).

Openness to Experience may also be an important factor in determining

who will succeed in dental school. Openness to Experience is significantly

correlated with measured intelligence (Costa & McCrae, 1992). Students who

score high on Openness to Experience are likely to be more open to new ideas and

learning experiences (Barrick & Mount, 1991). Those that are more Open To

Experience are also better at problem solving skills, which would be an

advantageous quality in clinical components of dental training (Barrick, Mount, &

Stewart, 1998).

Narrow or Broad Personality Traits for Prediction

Certain personality factors may be relevant in the prediction of dental

school performance both at a facet level and at a broader level of prediction. This

raises the question of whether broadly defined traits of personality are better

predictors of behavior than narrowly defined personality traits (Black, 2000).

Some researchers argue that more information can be gained through the use of multiple unidimensional predictors (Paunonen, Rothstein & Jackson, 1997) while others favor broader personality variables (Ones & Viswesvaran, 1996).

For selection purposes and for the prediction of success in an academic program such as dentistry, it would be beneficial to use both broad and narrow traits of personality to predict behavior. Using broad and narrow traits for personality assessment may reveal links between these traits and performance that would otherwise remain hidden. Ashton, Jackson, Paunonen, Helmes, & Rothstein (1995) concluded that the facets of Conscientiousness had higher validity coefficients compared to the validity coefficients obtained for the general domain of Conscientiousness. Paunonen and Ashton (2001) also demonstrated that lower level personality traits are superior to higher level ones in their ability to predict course grades. More specific facets of personality may be better predictors when used to select students for admission to academic programs. Aggregating facets into one dimension has the potential of losing information; if the dimension is a successful predictor it becomes impossible to examine which facets are responsible for the prediction.

The NEO personality inventory revised edition (NEO-PI-R), uses both the broad five factors as well as the narrow facets to assess personality characteristics. Using this measure, this study examines whether personality inventories will aid in the selection of dental students and in the prediction of success in dental training. Those students who are more Conscientious and more Open to Experience are expected to perform better. The study also compares the

usefulness of both broad based versus narrow based personality measures in predicting dental success.

<u>Various Predictor Combinations</u>

Concentrating on one variable in selection may result in the loss of other important information about the applicant. An examination of the joint predictability of several factors may provide a more accurate portrayal of an applicant and a better prediction of performance (Hogan, Hogan, & Roberts, 1996). Concentrating too much on one variable, such as general mental ability, may result in the loss of other important information from non-cognitive measures such as personality (Murphy & Davidshofer, 1998).

Schmidt & Hunter (1998) examined the validity of various predictor combinations and reported that general mental ability in combination with an interview with high structure has a validity of .63, while adding an interview that lacks structure improves validity to only .55. GMA and a structured interview appear to be the best predictors of performance. Personality added to measures of cognitive ability also enhances the prediction of performance (Schmidt & Hunter, 1998).

Research has examined the increases in validity that other measures provide over and above measures of general mental ability. Interviews, to the extent that they are structured, can predict performance above measures of general mental ability (Cortina, Goldstein, Payne, Davison, & Gilliland, 2000). As well, personality can account for additional variance beyond that offered by general mental ability (Salgado, 1998). Little, if any research, has examined the increase

in validity due to adding a personality measure to both a measure of general mental ability and an interview.

Summary

Few studies have examined the incremental validity of multiple predictors for the purposes of admissions to dental training programs. Prediction offered by traditional measures including general mental ability and an interview may be enhanced through the use of other non-cognitive factors. Using a sample of dental students in Canada, the goals of the present study are to:

1. Examine the validity of two components of the selection system used for the selection of dental candidates in Canadian dental schools. This will involve an examination of the DAT and the Canadian Dental Association's interview.

2. Evaluate the validity of the Five Factor Model of Personality as a predictor of performance in dental programs both in academic and clinical components of training. Personality measures are expected to predict performance in dental school. More specifically, Conscientiousness and Openness to Experience are expected to predict performance in clinical components of training.

3. Examine whether the addition of a personality measure will improve the validity of a selection model that includes a measure of general mental ability and an interview. Personality is expected to provide a significant increment in validity to the current selection model. More specifically,

personality should increase the amount of variance explained in dental

school performance beyond that provided by the dental interview.

4. Explore whether broader personality factors or the narrow facets of these

factors are better at predicting dental school performance.

METHOD

Participants

One hundred and forty-five dental students from first through third year at

two Canadian dental schools participated in the study. The average age of the

students was 26. Forty-six percent of the students were male, 54 percent were

female. Participants were invited to participate in the study by the researchers

during routine class time. Participation in the study was strictly voluntary and

participants were assured that any data obtained through the course of the study

would remain confidential. Each participant was required to sign a consent form

that clearly explained the purpose of the study and were informed that they could

terminate participation at any time (See Appendix A). Table1 shows stratification

of the sample across gender and location. Table 2 shows the number of subjects

in each year of study. Chi square tests of independence revealed that the

distributions among the variables in table one and two have equal proportions.

Table 1
Stratification of sample across gender and location

	Nova Scotia	British Columbia
	n	n
Male	39	28
Female	53	25

$\chi^2 (1, n= 145)=1.47 \ p > .05$

Table 2

Stratification of Sample across Gender and Year of Study for Entire Sample

	First Year	Second Year	Third Year
	n	n	n
Male	20	9	26
Female	23	17	25

χ^2 (2, n= 145)=1.91 p > .05

Predictor Measures

Personality Inventory: The NEO-PI-R, Form S (Costa & McCrae, 1992) was used to assess the personalities of dental students in the current study. The NEO-PI-R is a 240-item scale that was developed in 1992 as a measure of the five broad domains of personality, including Extraversion, Conscientiousness, Neuroticism, Openness and Agreeableness as well as the important traits or facets that define each domain. There are 6 narrow facets for each of the broad factors. These are presented in Table Three. Test retest reliabilities for the NEO-PI-R range from .68 to .83 for the N, E, and O, scales for both self-report and observer ratings (Costa & McCrae, 1988). Cronbach's Alpha Coefficients were calculated for the NEO-PI-R, with internal consistencies for the individual facet scales ranging from .56 to .81 for self reports, and from .6 to .9 for observer ratings (Costa & McCrae, 1988). The NEO-PI-R is also a valid measure of personality. This has been demonstrated through studies addressing the convergent validity of the measure. For example, the NEO-PI-R correlates with the 16 Personality Factor Inventory (Cattell,Cattell, and Cattell (1993).

The alpha coefficients for the relevant scales of the NEO-PI-R in the current study were: (.83) for the Agreeableness scale, (.84) for the Neuroticism

scale, (.62) for the Extraversion scale, (.83) for the Conscientiousness subscale,

and (.70) for the Openness subscale.

Table 3

Domains and Facets of the NEO Personality Inventory-Revised

Agreeableness	
Trust:	Believe others honest, well intentioned.
Straightforwardness:	Frank, sincere and ingenious
Altruism:	Genuine concern for others, considerate, helpful
Compliance:	Control of aggression, forgiving
Modesty:	Humble, self-effacing
Tender-Mindedness:	Sympathetic
Neuroticism	
Anxiety:	Apprehensive, fearful, prone to worry
Angry Hostility:	Angry, frustrated
Depression:	Feelings of guilt and sadness
Self-Consciousness:	Uneasy around others, sensitive to ridicule
Impulsiveness:	Inability to control cravings and urges
Vulnerability:	Inability to cope with stress, dependent, panicky
Extraversion	
Warmth:	Affectionate, friendly, ability to form close attachments
Gregariousness:	Enjoys company of others, enjoy social situations
Assertiveness:	Dominant, forceful, socially ascendant
Activity:	Rapid tempo, vigorous movement
Excitement Seeking:	Craves excitement and stimulation, likes noisy environments
Positive Emotions:	Laugh easily, cheerful, optimistic
Conscientiousness	
Competence:	Capable, well prepared, sensible
Order:	Neat, tidy, well organized
Dutifulness:	Adhere strictly to ethical principles
Achievement Striving:	High aspirations, diligent, sense of direction
Self-Discipline:	Motivated
Deliberation:	Thinks carefully before acting, deliberate, cautious
Openness to Experience	
Fantasy:	Vivid imagination, active fantasy life, daydreamer
Aesthetics:	Deep appreciation for art and beauty, moved by poetry, music
Feelings:	Experiences deeper, more differentiated emotional states
Actions:	Prefer novelty and variety to familiarity and routine
Ideas:	Intellectually curious, enjoys philosophical arguments
Values:	Readiness to reexamine social, political, and religious values

Cognitive Measures Four components of the DAT were used as measures

of general mental ability. These included the Survey of Natural Science

Examination, the Reading Comprehension Examination, the Perceptual Motor

Ability Test, and the Carving Dexterity Test. These tests were taken by students

as part of the admission process and were obtained from their student records.

Interview As part of their admission process, all participants had been interviewed using the Canadian Dental Association's Interview. Admission committees, using CDA guidelines, scored interview results that were used to make admission decisions in conjunction with information from the DAT. The interview scores were also obtained from student records.

Criterion Measures

Five criterion were used to measure performance in dental school.

Criterion One The first criterion was grade point average in year one of dental training. This was a composite measure derived from academic course work. It was an average from courses that covered topics such as human biochemistry, anatomy, histology, physiology, basic mechanisms of disease, infectious diseases, cariology, and periodontology.

Criterion Two The second criterion included the average assessments from year two in dental training that covered advanced topics of the same courses from year one. The second criterion also included an evaluation of student's performance in a clinical component of dental training.

Criterion Three The third criterion was a measure of clinical competence in year three of dental training.

Criterion Four The fourth criterion assessed academic course work in year three.

Criterion Five The fifth criterion was a composite score of the third and fourth criterion.

Data Collection

Participants that completed the NEO-PI-R, as part of this study, were in either first, second, or third year of their dental training. Archival data were collected on these students from their admissions files. This data consisted of DAT scores, interview scores, and performance measures in all years of training that had been completed. For example, performance data of a fourth year student only included their performance measures up to their third year of training. Performance data on a third year student included performance measures from year one, year two and year three of study. Data on a second year student included performance measures from both their first year and second year of dental training. Performance data on a first year student included performance measures from his or her first year of study.

RESULTS

Gender Differences. Table four presents mean scores for males and females on the subscales of the NEO-PIR, the interview score and the four measures of the DAT. T-tests were calculated for the sample with Bonferroni corrections to control for type one error. There was a significant difference between males and females on the Neuroticism factor of the personality measure with Males, M=73.49, scoring significantly lower than females, $M = 86.10$, ($t = -3.42$, $p < .01$). No other significant differences between males and females were detected.

Table 4

Descriptive Statistics for male vs. female participants

Measures	Gender	n	Mean	SD
DAT academic	male	64	19.94	2.20
	female	74	18.97	2.88
DAT reading	male	58	20.40	3.11
	female	71	20.90	3.23
DAT perception	male	64	18.25	2.30
	female	74	17.50	2.60
DAT chalk carving	male	56	20.27	5.02
	Female	69	18.16	4.95
Interview	male	64	31.60	3.52
	female	75	32.34	3.56
Agreeableness	male	67	120.91	20.22
	female	78	126.28	17.98
Neuroticism	male	67	73.49	19.28
	female	78	86.10	24.26
Extraversion	male	67	124.04	17.80
	female	78	125.32	20.81
Conscientiousness	male	67	127.91	18.58
	female	78	127.08	19.16
Openness	male	67	116.84	18.77
	female	78	123.26	17.79

School differences

Table five presents mean scores for British Columbia (BC) participants

and Nova Scotia (NS) participants on the subscales of the NEO-PI-R, the

interview score, and the four measures of general mental ability. T-tests were

again calculated for the sample with Bonferroni corrections controlling for type

one error. There were no significant differences between participants in BC and

NS on any of the sub scales of the NEO-PI-R. Significant differences, however,

between BC participants (M = 29.68) and NS participants (M = 33.43), occurred

on the interview with NS participants scoring significantly higher than BC

participants (t = 7.03, $p<.01$). BC participants (M = 21.09), scored significantly

higher than NS participants (M = 18.38) on the DAT academic average measure (t

= -6.84, $p<.01$).

Significant differences also occurred between the two schools on the DAT

perceptual ability measure, the DAT reading comprehension measure, and the

DAT carving test. Specifically, NS participants scored significantly lower than

BC participants on the DAT reading comprehension measure (NS: $\underline{M}$ = 19.76;

BC: $\underline{M}$ = 21.98; $\underline{t}$ = -4.14, $\underline{p}$< >01), on the DAT perceptual ability measure (NS:

$\underline{M}$ = 17.05; BC: $\underline{M}$ = 19.13; $\underline{t}$ = -5.24, $\underline{p}$<.01), and on the DAT carving test (NS:

$\underline{M}$ = 17.25; BC: $\underline{M}$ = 21.62; $\underline{t}$ = -5.23, $\underline{p}$< .01).

Correlations among study variables

Pearson Product moment correlations were calculated for all variables. A

correlation matrix for all variables is presented in Appendix B.

Table 5
Descriptive Statistics for British Columbia (BC) vs. Nova Scotia (NS)participants

	Participants	n	Mean	SD
DAT Academic	NS	85	18.38	2.46
	BC	53	21.09	1.91
DAT reading	NS	76	19.76	2.94
	BC	53	21.98	3.06
DAT perception	NS	85	17.05	2.47
	BC	53	19.13	1.91
DAT carving test	NS	72	17.25	3.56
	BC	53	21.62	3.21
Interview	NS	86	33.43	3.15
	BC	53	29.68	2.88
Agreeableness	NS	92	127.64	17.98
	BC	53	117.13	19.50
Neuroticism	NS	92	77.40	22.37
	BC	53	85.26	23.19
Extraversion	NS	92	124.15	19.49
	BC	53	125.74	19.44
Conscientiousness	NS	92	126.53	18.38
	BC	53	129.08	19.67
Openness	NS	92	121.79	17.42
	BC	53	117.68	20.06

Relationships between Broad Personality Factors and Performance

Pearson Product moment correlations between the Five Broad Personality Factors and dental school performance are presented in Table 6. Openness to Experience was significantly related to performance in year two of dental training, ($r = -.18$), in year three clinical training ($r = -.15$), in year three course work ($r = -.40$), and in year three overall ($r = -.26$). Those students who scored lower on the Openness to Experience factor performed better in dental school in years two and three than those individuals that scored higher on the Openness to Experience factor. That is, those students who are not as imaginative, are not as intellectually curious, and tend to be more focused on keeping their minds on the task at hand performed better in the second and third year of dental training. As can be seen in Table 5, none of the other broad personality factors were related to performance in any year of dental training.

Relationships between DAT scores, the Interview, and Performance

Cognitive ability (the academic average component of the DAT) was significantly related to performance in year one of dental training ($r = .24$, $p<.01$). Students who performed better on the Academic Average component of the DAT outperformed students in year one of study who scored lower on the Academic Average component of the DAT. Cognitive ability was not related to performance in year three of study.

The Interview was negatively related to performance in year one of study ($r = -.17$, $p<.01$). That is, students who scored lower on the interview did better in

year one of dental training than students who scored higher on the interview.

Table 7 presents the summary of coefficients.

Relationships between Broad Personality Factors, DAT scores, and the Interview

Table 8 presents the relationships between the Broad Personality Factors, the DAT scores, and the Interview. Agreeableness had a small but significant negative relationship with the academic average component of the DAT (r = -.19, p< .01), the perceptual ability component of the DAT (r = -.18, p< .01), the reading comprehension component of the DAT (r = -.15, p< .01), and the carving test (r = -.15, p <. 01). Students who were less Agreeable were superior performers on the DAT than students who were more Agreeable. A moderate significant relationship occurred between Agreeableness and the Interview. Students who were more Agreeable had higher scores on the interview than those that were less Agreeable (r = .21, p < .01). That is, students that are sympathetic and moved by others needs did better on the interview than those who may be less moved by appeals to pity. Those that have aggressive tendencies, and may have a slightly more competitive nature, are rational, and less reluctant to get involved in other people's problems scored higher on the DAT.

The Interview was also significantly and negatively correlated with all four components of the DAT: the academic average (r = -.21), the reading comprehension (r = -.06), the perceptual ability (r = -.35), and the carving test (r = -.34). Students who scored lower on the interview scored higher on these four components of the DAT.

Relationships between the facets of the Broad Personality Factors and Dental

School Performance

The relationships between the facets of the broad personality factors and

dental school performance are presented in Tables 9 through 13. Three facets of

Agreeableness were related to some of the criteria; Straightforwardness was

moderately and positively related to performance in year two of training,

suggesting that those who were more sincere were better performers in year two (r

= .24, p< .01). Students who were less Compliant performed better in the course

work component and overall during year three of training (r = -.37, -.24,

respectively). Students who scored lower on Tender-Mindedness, also did better

in this component of dental training suggesting that those students who may be

less rational and less moved by appeals to pity will be superior performers

throughout this portion of training (r = -.26, p<.05). A moderate relationship

occurred between Vulnerability, a facet of Neuroticism and third year course

work. Students that were more vulnerable performed better in third year course

work than students who were less vulnerable (r = .38, p< .01). A moderate

relationship occurred between Positive Emotions, a facet of Extraversion, and

third year clinical training. Students that had more positive emotions

outperformed those who had less positive emotions in clinical components of

dental training (r = .25, p< .05). There were no significant relationships between

the facets of Conscientiousness and performance in year one, two or three of

study. Three of the facets of Openness to Experience were moderately correlated

with performance. Individuals who spent more time Fantasizing performed worse

in course work in year three of dental training than those who spent less time

Fantasizing (r = -.33, p<.05) Those who were less Open to New Ideas, with a

tendency to narrowly focus on a limited number of topics performed better in year

two, year three clinical, year three course work, and year three overall (r =-.20, -

.26, -.33,-.27, respectively.). Lastly, those that scored low on Aesthetics

performed better in year three course work and overall (r = -.33, -.27,

respectively).

Hierarchical regression analyses: Hierarchical regression analyses were used to

determine whether a measure of personality could predict performance in dental

school over and above the interview and general mental ability in the existing

selection system. Assumptions of normality, linearity, homoscedasticity,

independence of residuals, potential multicollinearity problems, and outliers were

evaluated and found to be acceptable. A separate regression analysis was

performed for each of the five criterion measures used to assess performance in

dental school.

The interview was negatively correlated with performance in year one of

study and was not significantly related to any of the other criterion variables. It

was however, positively related to Agreeableness. Openness to Experience was

the only personality variable that correlated with the criterion measures so the

other four personality factors were excluded from the regression analyses.

Table 6

Correlations for Broad Personality Factors and Dental School Performance Criteria

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. GPA year one	81.74	6.16	-									
2. GPA year two	79.24	5.58	.42**	-								
3. Clinical three	78.07	7.73	.25	.62**	-							
4. Course work three	78.21	8.57	.20	.75	.43**	-						
5. OGPA year three	78.91	5.78	.35**	.82	.68**	.90**	-					
6. Agreeableness	123.80	19.17	.04	.10	-.02	-.15	-.07	-				
7. Neuroticism	80.27	22.91	-.10	.01	.11	.21	.11	-.27	-			
8. Extraversion	124.73	19.43	.01	-.12	.19	-.10	-.07	.15*	-.30**	-		
9. Conscientiousness	127.46	18.83	.01	.06	.10	.01	.06	.26**	-.36	.09	-	
10. Openness	120.29	18.47	.02	-.18*	-.15*	-.40**	-.26**	.29**	-.14*	.50**	.06	-

Note: **$p<.01$, *$p<.05$
One-tailed test

Table 7

Correlations for DAT scores, Interview Scores and Dental School Performance Criteria

		Mean	SD	1	2	3	4	5	6	7	8	9	10
1.	GPA year one	81.74	6.16	-									
2.	GPA year two	79.24	5.58	.42**	-								
3.	Clinical year three	78.07	7.73	.25	.62**	-							
4.	Course work three	78.21	8.57	.20	.75*	.43**	-						
5.	OGPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-					
6.	DAT academic average	19.42	2.62	.24**	-.04	-.07	-.02	-.03	-				
7.	DAT perception	17.84	2.45	.08	.13	.16	.04	.14	.36**	-			
8.	DAT reading comp	20.67	3.18	.09	.12	-.08	.25	.15	.63**	.25**	-		
9.	DAT chalk carving	19.10	5.07	.08	.02	.08	.19	.14	.29**	.38**	.16*	-	
10.	Interview Scores	32.00	3.55	-.17**	.03	.07	.05	-.06	-.21**	-.35**	-.06	-.34**	-

Note: **p<.01, *p<.05
One-tailed test

Table 8
Correlations between Broad Personality Factors, the DAT, and the Interview.

		Mean	SD	1	2	3	4	5	6	7	8	9	10
1.	Agreeableness	123.80	19.17	-									
2.	Neuroticism	80.28	22.91	-.27**	-								
3.	Extraversion	124.73	19.42	.15*	-.30**	-							
4.	Conscientiousness	127.46	18.83	.26**	-.36**	.09	-						
5.	Openness	120.29	18.47	.29**	-.14*	.50**	.06	-					
6.	DAT academic average	19.42	2.62	-.19*	-.01	-.07	.02	-.02	-				
7.	DAT reading comprehension	20.67	3.18	-.15*	.04	-.09	-.00	-.04	.63**	-			
8.	DAT perceptual ability	17.85	2.48	-.18*	-.04	.01	.04	-.02	.36**	.25**	-		
9.	DAT carving test	19.10	5.07	-.15*	.01	.04	.04	-.13	.29**	.16**	.38**	-	
10.	Interview scores	32.00	3.55	.21**	-.17	.11	.03	.12	-.21**	-.06**	-.35**	-.34**	-

Note: **p<.01, *p<.05
One-tailed test

Table 9

Correlations for Facets of Agreeableness and Dental School Performance Criteria

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. GPA year one	81.74	6.16	-										
2. GPA year two	79.24	5.58	.42**	-									
3. Clinical year three	78.07	7.73	.25	.62**	-								
4. Course work three	78.21	8.57	.20	.75*	.43**	-							
5. GPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-						
6. Trust	20.88	4.07	.02	.08	-.02	-.01	-.01	-					
7. Straightforwardness	20.51	4.97	.10	.24**	-.01	.13	.15	.39**	-				
8. Altruism	24.34	3.80	-.09	-.06	.08	-.14	.13	.46**	.47**	-			
9. Compliance	18.05	4.54	.07	.02	.05	-.37**	-.24*	.43**	.40**	.44**	-		
10. Modesty	19.20	5.03	.00	.13	-.13	-.07	-.11	.39**	.57**	.40**	.37**	-	
11. Tender Mindedness	20.35	3.73	.09	-.04	-.02	-.26*	-.10	.54**	.44**	.54**	.49*	.46*	-

Note: **p<.01, *p<.05
One-tailed test

Table 10
Correlations for Facets of Neuroticism and Dental School Performance Criteria

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1.	GPA year one	81.74	6.16	-										
2.	GPA year two	79.24	5.58	.42**	-									
3.	Clinical year three	78.07	7.73	.25	.62**	-								
4.	Course work three	78.21	8.57	.20	.75*	.43**	-							
5.	GPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-						
6.	Anxiety	15.67	5.73	-.03	.03	.11	.13	.17	-					
7.	Angry Hostility	12.43	5.16	-.12	-.06	.04	.18	.07	.46**	-				
8.	Depression	12.16	5.14	-.12	-.02	-.01	-.08	-.03	.63**	.53**	-			
9.	Self-Consciousness	16.92	4.36	-.03	.05	-.08	.14	.05	.59**	.47**	.67**	-		
10.	Impulsiveness	9.39	4.10	-.08	.01	.25	.23	.15	.20**	.35**	.29**	.17*	-	
11.	Vulnerability	20.35	3.73	-.13	.08	.22	.38**	.24*	.62**	.49**	.67**	.60**	.35**	-

Note: **p<.01, *p<.05
One-tailed test

Table 11

Correlations for Facets of Extraversion and Dental School Performance Criteria

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. GPA year one	81.74	6.16	-										
2. GPA year two	79.24	5.58	.42**	-									
3. Clinical year three	78.07	7.73	.25	.62**	-								
4. Course work three	78.21	8.57	.20	.75*	.43**	-							
5. GPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-						
6. Warmth	24.20	4.06	-.00	-.08	.05	-.21	-.13	-					
7. Gregariousness	20.62	9.27	-.02	-.03	.09	-.15	-.02	.21**	-				
8. Assertiveness	18.03	5.07	.06	-.12	.05	-.03	-.11	.15**	.10	-			
9. Activity	19.12	4.23	-.04	-.16	.20	-.04	-.14	.17**	.07	.55**	-		
10. Excitement Seeking	20.09	4.71	.03	.01	.16	.03	.03	.23**	.22**	.31**	.28*	-	
11. Positive Emotions	22.57	4.32	.04	-.09	.25*	-.02	-.05	.62**	.15**	.34**	.36**	.43**	-

Note: $**p<.01$, $*p<.05$
One-tailed test

Table 12
Correlations for Facets of Conscientiousness and Dental School Performance Criteria

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. GPA year one	81.74	6.16	-										
2. GPA year two	79.24	5.58	.42**	-									
3. Clinical year three	78.07	7.73	.25	.62**	-								
4. Course work three	78.21	8.57	.20	.75*	.43**	-							
5. GPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-						
6. Competence	22.74	3.31	.06	.01	-.21	-.18	.09	-					
7. Order	19.24	4.40	-.14	.00	.13	.15	.10	.32**	-				
8. Dutifulness	24.23	3.94	.04	.02	-.06	-.02	-.07	.51**	.43**	-			
9. Achievement Striving	20.99	4.16	.01	-.07	.16	.11	.05	.49**	.42**	.47**	-		
10. Self-Discipline	21.45	4.68	.14	.06	.10	-.05	.02	.58**	.42**	.59**	.58**	-	
11. Deliberation	18.30	4.74	-.05	.13	.21	-.03	.03	.43**	.46**	.44**	.41**	.42**	-

Note: **$p<.01$, *$p<.05$
One-tailed test

Table 13

Correlations for Facets of Openness and Dental School Performance Criteria

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1.	GPA year one	81.74	6.16	-										
2.	GPA year two	79.24	5.58	.42**	-									
3.	Clinical year three	78.07	7.73	.25	.62**	-								
4.	Course work three	78.21	8.57	.20	.75*	.43**	-							
5.	GPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-						
6.	Fantasy	18.59	5.40	.06	-.11	-.08	-.33*	-.23*	-					
7.	Aesthetics	18.84	5.83	-.07	-.13	-.06	-.33*	-.27*	.17**	-				
8.	Feelings	22.42	4.49	.00	-.14	-.01	-.14	-.09	.22**	.57**	-			
9.	Actions	17.06	3.61	.10	-.04	-.09	-.04	-.03	.15**	.27**	.37**	-		
10.	Ideas	20.69	5.61	-.01	-.20*	-.26*	-.33*	-.27*	.17*	.44**	.34**	.20**	-	
11.	Values	22.46	3.79	.04	-.03	-.00	-.16	-.02	.29**	.32**	.29**	.32**	.32**	-

Note: **p<.01, *p<.05
One-tailed test

In all of the regression analyses, age, gender, school, and year of study were entered on step one to control for the influence of these variables. When performance in later years in dental school was used as a criterion, performance in earlier years were also entered as control variables. For example, for third year performance as a criterion, performance in year one and year two were entered on Block one as control variables. The measures of cognitive ability were entered as a block on step two followed by the interview on step three. Openness to Experience, the personality measure, was entered on step four. This order of entry was maintained for all of the regression analyses.

In the first regression, the criterion was performance in year one of dental school. The control variables produced a significant R^2 change ($\Delta R^2 = .12$, $F_{4,121} = 3.98$, $p < .01$). The addition of the cognitive ability measures improved the prediction of dental school performance with academic average providing the largest incremental gain ($\beta = .28$). The prediction of performance did not improve with the addition of the interview or the personality measure. Results of this analysis are presented in Table 14.

Table 14
Hierarchical Regression Analysis; Prediction of Year 1 Dental School Performance

Step	Independent Variables	Beta	R	Rsq	ΔRsq	FΔ	Sig. FΔ
1	Age	-.30**	.34	.12	.12	3.98	.00
	Gender	-.13					
	School	-.08					
	Year of Study	.10					
2	Cognitive Ability		.41	.17	.05	2.52	.05
	DAT academic average	.28**					
	DAT perceptual ability	.08					
	DAT reading comp.	-.07					
3	Interview	-.18	.44	.19	.02	3.19	.07
4	Personality		.44	.17	.00	.00	.98
	Openness	-.02					

Note: p<.01=**, p<.05=* N=125

In the second analysis, performance in year two in dental school was used

as the criterion variable. The control variables accounted for 25 % of the variance

in the criterion ($\Delta R^2 = .25$, $F_{5,83} = 5.48$, $p<.01$). The addition of cognitive ability

($\Delta R^2 = .09$, $F_{3,80} = 5.20$, $p<.05$) accounted for an additional 9% of the variance in

performance in year two in dental school. The interview did not increase the

prediction of performance. Openness to Experience further improved the

prediction by accounting for another 5% of the variance ($\Delta R^2 = .05$. $F_{1,79} = 5.59$,

$p<.05$). Results of this analysis are presented in Table 15.

Table 15
Hierarchical Regression Analysis: Year two criterion

Step	Independent Variables	Beta	R	Rsq	ΔRsq	F∆	Sig. F∆
1	Age	-.15	.50	.25	.25	5.47	.00
	Gender	.04					
	School	.23*					
	Year of Study	-.21*					
	Performance year one	.42**					
2	Cognitive Ability		.59	.34	.09	3.80	.01
	DAT academic average	.28*					
	DAT perceptual ability	.25*					
	DAT reading comp	.27*					
3	Interview	.09	.59	.35	.00	.64	.43
4	Personality		.63	.40	.05	6.13	.02
	Openness	-.23*					

Note: $p< .01=**$, $p<.05=*$ N=83

In the third analysis, course work performance in year three of dental

school was used as the criterion variable. The control variables accounted for 65

% of the variance in the criterion ($\Delta R^2 = .65$, $F_{6,34} = 10.57$, $p<.01$). The addition

of cognitive ability and the interview did not improve prediction, however, the

addition of Openness to Experience improved the prediction by accounting for

another 5% of the variance ($\Delta R^2 = .05$, $F_{1,30} = 9.13$, $p<.05$). Results of the analysis

are presented in Table 16.

Table 16
Hierarchical Regression Analysis: Course work year three criterion

Step	Independent Variables	Beta	R	Rsq	ΔRsq	FΔ	Sig. FΔ
1	Age	.09	.81	.65	.65	10.57	.00
	Gender	.17					
	School	.20					
	Year of Study	.10					
	Performance year one	-.09					
	Performance year two	.81**					
2	Cognitive Ability		.84	.70	.05	1.79	.17
	DAT academic average	-.17					
	DAT perceptual ability	-.19					
	DAT reading comp.	-.20					
3	Interview	.14	.85	.72	.01	1.33	.26
4	Personality		.88	.77	.06	6.12	.02
	Openness	-.24*					

Note: p<.01=**, p<.05=*, N=40

In the fourth analysis, a measure of clinical performance in year three of dental school was used as the criterion variable. The control variables accounted for 48 % of the variance in the criterion ($\Delta R^2 = .48$, $F_{6,33} = 5.16$, p<.01). The addition of cognitive ability did not improve the prediction nor did the addition of Openness to Experience. However, the third step, the addition of the interview did result in a significant r square change ($\Delta R^2 = .07$, $F_{6,33} = 5.57$, p<.05). Results of this analysis are presented in Table 17.

In the fifth analysis, a composite measure of both clinical and course work performance in year three of dental school was used as the criterion variable. The control variables accounted for 74 % of the variance in the criterion ($\Delta R^2 = .74$, $F_{6,54} = 25.84$, p<.01). Neither the addition of cognitive ability, the interview, nor Openness to Experience improved prediction. Results of this analysis are presented in Table 18.

Table 17
Hierarchical Regression Analysis; Clinical year three criterion

Step	Independent Variables	Beta	R	Rsq	ΔRsq	FΔ	Sig. FΔ
1	Age	-.25	.70	.48	.48	5.15	.00
	Gender	-.12					
	School	.21					
	Year of Study	.09					
	Performance year one	-.09					
	Performance year two	.64**					
2	Cognitive Ability		.74	.55	.06	1.34	.28
	DAT academic average	-.10					
	DAT perceptual ability	.07					
	DAT reading comp.	-.20					
3	Interview	.34*	.79	.62	.07	5.57	.03
4	Personality		.79	.62	.00	.02	.89
	Openness	-.02					

Note: p<.01=**, p<.05=* N=40

Table 18
Hierarchical Regression Analysis number five

						Composite year three criterion	
Step	Independent Variables	Beta	R	Rsq	ΔRsq	FΔ	Sig. FΔ
1	Age	.15	.86	.74	.74	25.84	.00
	Gender	.14					
	School	.19					
	Year of Study	.00					
	Performance year one	.08					
	Performance year two	.81**					
2	Cognitive Ability		.87	.76	.01	.89	.45
	DAT academic average	-.12					
	DAT perceptual ability	-.07					
	DAT reading comp.	.03					
3	Interview		.87	.76	.00	.01	.92
4	Personality		.87	.76	.01	1.38	.25
	Openness	-.09					

Note: p<.01=**, p<.05=* N=60

Hierarchical Regression Analyses with Narrow Personality Facets

In the next set of analyses, the narrow facets of the broader personality factors that were related to the criterion variables were entered on the fourth step of each analysis in place of Openness to Experience for each of the five criterion measures. For performance in year two in dental school[2] Straightforwardness and

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2. None of the facets were correlated with Year one performance.

Ideas were entered on step four. The control variables accounted for 25 % of the variance in the criterion ($\Delta R^2 = .25$, $F_{5,83} = 5.47$, $p<.01$). Cognitive ability accounted for an additional 9% of the variance in performance in year two in dental school ($\Delta R^2 = .09$, $F_{3,80} = 5.20$, $p<.05$). The addition of the interview did not improve prediction. The addition of the two facets improved the prediction by accounting for another 5% of the variance ($\Delta R^2 = .05$, $F_{1,79} = 5.59$, $p<.05$). Results of the analysis are presented in Table 19.

Table 19
Hierarchical Regression Analysis; Year two criterion

Step	Independent Variables Sig. FΔ	Beta	R	Rsq	ΔRsq	FΔ	
1	Age	-.15	.50	.25	.25	5.47	.00
	Gender	.04					
	School	-.22*					
	Year of Study	.23*					
	Performance year one	.42**					
2	Cognitive Ability		.59	.34	.09	3.80	.01
	DAT academic average	-.29*					
	DAT perceptual ability	.25*					
	DAT reading comp	.27*					
3	Interview	.09	.59	.34	.00	.64	.43
4	Personality facets		.63	.40	.05	3.34	.04
	A2 (Straightforwardness)	.17					
	O5 (Ideas)	-.17*					

Note: $p<.01=**$, $p<.05=*$ N=83

Clinical performance in year three of dental school was the criterion in the seventh analysis. The personality facets related to the year three clinical criterion, positive emotions and ideas, were entered on step four. The control variables accounted for 48 % of the variance in the criterion ($\Delta R^2 = .48$, $F_{6,34} = 5.15$, $p<.01$). The addition of cognitive ability did not improve the prediction, however, the interview accounted for an additional 7 % of the variance ($\Delta R^2 = .07$, $F_{10,30} = 4.70$, $p<.05$). Furthermore, the addition of the two personality facets accounted for

another 11 % of the variance ($\underline{\Delta R}^2 = .11$, $\underline{F}_{6,34} = 6.07$, p<.05). Results of this analysis are presented in Table 20.

In the eighth analysis, course work in year three of dental training was used as the criterion. The personality facets related to the course work criterion namely, compliance, tendermindedness, vulnerability, fantasy, aesthetics and ideas were on step three. The control variables accounted for 65 % of the variance in the criterion ($\underline{\Delta R}^2 = .65$, $\underline{F}_{6,34} = 10.57$, p<.01). The addition of cognitive ability or the interview did not improve the prediction however, the addition of the narrow personality facets accounted for another 24% of the variance ($\underline{\Delta R}^2 = .24$, $\underline{F}_{1,30} = 9.13$, p<.01). Results of the analysis are presented in Table 21.

Table 20
Hierarchical Regression Analysis: Year three clinical criterion

Step	Independent Variables Sig. FΔ	Beta	R	Rsq	ΔRsq	FΔ	
1	Age	-.25	.69	.48	.48	5.15	.00
	Gender	-.12					
	School	.21					
	Year of Study	.09					
	Performance year one	-.09					
	Performance year two	.64**					
2	Cognitive Ability		.74	.55	.06	1.33	.28
	DAT academic average	-.10					
	DAT perceptual ability	.07					
	DAT reading comp	-.20					
3	Interview	.34*	.79	.62	.07	5.57	.03
4	Personality facets		.85	.73	.11	5.56	.01
	E6 (Positive Emotions)	.31*					
	O5 (Ideas)	-.28*					

Note: p<.01=**, p<.05=* N=40

In the final analysis a composite measure of performance in year three of dental school was used as the criterion. The personality facets that were related to the composite measure of performance in year three were entered on step four of

the analyses and included; Compliance, Tender-mindedness, Vulnerability,

Fantasy, Aesthetics, and Ideas. The control variables accounted for 74% of the

variance in the criterion ($\Delta R^2 = .74$, $F_{6,54} = 25.84$, $p<.01$). The addition of the

cognitive ability measures or the interview did not improve the prediction.

However, the prediction was improved with the addition of the personality facets

($\Delta R^2 = .08$, $F_{5,54} = 4.67$, $p<.01$). The results of this analysis are presented in Table

22.

Table 21
Hierarchical Regression Analysis; Year three course work criterion

Step	Independent Variables Sig. FΔ	Beta	R	Rsq	ΔRsq	FΔ	
1	Age	.09	.81	.65	.65	10.57	.00
	Gender	.17					
	School	.21					
	Year of Study	.09					
	Performance year one	-.09					
	Performance year two	.81**					
2	Cognitive Ability		.84	.70	.05	1.78	.17
	DAT academic average	-.16					
	DAT perceptual ability	-.18					
	DAT reading comp	.20					
3	Interview	.14	.85	.71	.01	1.33	.26
4	Personality facets		.98	.95	.24	18.68	.00
	A4 (Compliance)	-.37**					
	A6(Tender mindedness)	.07					
	N6(Vulnerability)	.21*					
	O1(Fantasy)	-.28**					
	O2(Aesthetics)	.09					
	O5 (Ideas)	.00					

Note: $p<.01=$**, $p<.05=$* N=40

DISCUSSION

The results of the current study suggest that the interview used for

selection to dental school does not aid in the prediction of performance in the first

two years of training and in effect may lead to poor selection decisions. The

Table 22

Hierarchical Regression Analysis; Year three overall criterion

Step	Independent Variables Sig. FΔ	Beta	R	Rsq	ΔRsq	FΔ	
1	Age	.15	.86	.74	.74	25.83	.00
	Gender	.14					
	School	.19*					
	Year of Study	-.00					
	Performance year one	-.04					
	Performance year two	.86**					
2	Cognitive Ability		.87	.75	.01	.89	.45
	DAT academic average	-.12					
	DAT perceptual ability	-.07					
	DAT reading comp	.03					
3	Interview	.03	.87	.75	.00	.01	.92
	Personality facets		.92	.84	.08	4.64	.00
	A4 (Compliance)	-.24**					
	N6 (Vulnerability)	.09*					
	O1(Fantasy)	-.14*					
	O2(Aesthetics)	-.02					
	O5(Ideas)	-.04					

Note: $p<.01$=**, $p<.05$=* N=60

interview was negatively related to performance in the first year of dental training and was not related to any of the other criterion variables. Results of the study lend support to the idea that personality measures add incremental validity to tests of cognitive ability in the prediction of dental school performance. The personality measure and the cognitive ability measure predicted success in years one and two of dental training. Cognitive ability did little in the prediction of performance in the third year of training, after controlling for performance in the first two years; where as the personality measure still aided in this prediction.

Research Goal Number One

The current study examined the predictive validity of the Canadian Dental Associations Interview and the DAT. The interview does not aid in the prediction of dental school performance in the year one and year two of dental training. The

way the interview was developed is most likely responsible for its lack of prediction. Interviews that are used for the selection of candidates for training programs, such as dentistry, should be based on requirements of the training position (Whetzel & Wheaton, 1997). Furthermore, the validity of an interview will increase as it becomes more structured (Cortina, Goldstein, Payne, Davison, & Gillian, 2000; Huffcutt & Arthur, 1994).

The negative relationship of the interview to performance was unexpected. This suggests that using the interview in the selection battery to dental school may be counterproductive to good decision making in the selection process. The finding that students with better interview scores are actually performing more poorly in the first year of dental training raises serious concern about the use of this type of interview in the admissions process.

The relationship that occurred between Agreeableness and the Interview is also of interest. The interview is identifying students who are concerned for the welfare of others and are moved by other people's needs. These are soft factors that may be more related to clinical aspects of performance. Interestingly, the interview aided in the prediction of performance in the third year clinical criterion. This suggests that the interview is not aiding in the selection of students with high academic performance and is instead identifying those students with some qualities that may be important for success in clinical aspects of training. Having sincere concern for the welfare of others may be an appropriate quality for a student to possess in order to succeed through clinical aspects of training and ultimately is a quality that one would want a practicing dentist to possess. These

particular results are positive regarding the applicability of the interview, as it would suggest that the interview is at least picking up on factors that may be pertinent to success in clinical aspects of performance.

Results of the study add partial support to the hypothesis that general mental ability, as measured by the DAT, is a useful predictor in the selection of students for dental training programs. The DAT however, only improved the prediction of dental school performance in the first and second year of training, which is heavily based on academic work. This finding is consistent with previous studies that have shown that student performance in the first and second year of dental training is most predictable using measures of general mental ability such as the DAT (Hood, 1963; Kramer, 1986). When clinical components of training from the third year are introduced in the criterion measure, this prediction based on the DAT declines. Furthermore, as students' progress through their dental training the group of students becomes even more homogenous in terms of academic performance as students either fail or withdraw from the program. This makes it less likely that the DAT will be able to predict academic performance in the later years of training.

Another interesting finding concerning the DAT is that there were significant differences on DAT scores between schools. Regardless of the fact that BC students scored higher on the various components of the DAT, the NS students were still allowed entry into their particular program meaning that their DAT scores were acceptable. Various schools may place more weight than others on DAT scores in the admissions process. Furthermore, some schools also have a

score threshold concerning DAT scores, which means that students have to obtain a certain minimum score to even be considered. The predictability of the DAT varies from class to class and among schools (Ross, 1967; Dworkin, 1970). This may be a result of the differences in student DAT scores in various locations or in differences in the curriculum of the dental training programs at various schools of study. This addresses the importance of individual schools performing their own validation studies concerning the DAT, as the results are likely to vary based on a number of factors.

Results suggest that the DAT is a useful predictor in the selection of dental candidates for success in dental training programs during the first and second year of academic course work. However, it may be beneficial for admissions officers to consider other predictors to enhance prediction in the later years of training when clinical concepts are introduced into the curriculum.

Research Goal Number Two

The results of the study did not support the hypothesis regarding Conscientiousness. Conscientiousness was not related to success in dental school in any year of study. This finding is at odds with previous literature that explores the relationship between Conscientiousness and various aspects of performance (Barrick & Mount, 1991; Mount, Murray, & Strauss, 1994). There is now however, a growing literature as to the exact nature of this relationship and whether the influence of Conscientiousness is applicable to all types of work. There may be limits to the range of occupational areas that conscientiousness is linked with job performance. For example, being overly Conscientious may

actually hinder performance in areas of work that require quick decision making (Tett, 1998). This may apply to clinical components of dental training where students are forced to make quick decisions as to various approaches concerning how dental problems should be resolved, which subsequently may have resulted in the lack of significant findings concerning this characteristic.

The lack of significant relationships may also be the result of the criterion variables that were used in the study. For example, the use of single global criteria can mask specific relations and produce misleadingly low validities (Salgado, 1997). Paunonen, Rothstein, and Jackson (1999) have also commented on the downfalls of using global criteria. They found that when criteria are more narrowly defined, the predictive validity of Conscientiousness increases. Perhaps the composite measures of student ratings that were used in the current study were not specific enough to have yielded a significant finding. The clinical and course work performance measures, although segregated, were also composite measures of performance that were derived from a number of courses in these areas.

Openness to Experience was related to success in dental school in only year two and three of dental training. This relationship, however, was negative. Those students that were less open to new experiences performed better in dental school than those that were more open. That is, those students who may not be as imaginative or as intellectually curious, as well having a tendency to be more focused on keeping their minds on the task at hand, performed better. The relationship between Openness to Experience and performance has also yielded inconsistencies in the literature (Hays, Roehms & Costellano, 1994). Given that

the second year criteria included an evaluation of students interacting with patients in a very controlled environment, perhaps those that were less open to new ideas performed better because they were more compliant. Furthermore, the dental training environment may not be conducive to creativity, which may be the reason that those that were less open and more predisposed to following established procedures performed better. The dental school curriculum is often described as a "cook-book" approach to learning and as such may not favor the learning styles of individuals that are more creative in their thinking.

Research Goal Number Three

Openness to Experience aided in the prediction of dental training performance in year two of study accounting for an additional 9 percent of the variance in the prediction of year two in dental training beyond that offered by cognitive ability. In the third year composite and clinical component of training, Openness to Experience did not account for additional variance. However, Openness to Experience accounted for an additional 5 percent of the variance in predicting course work components of year three in dental school whereas cognitive ability did not aid in this prediction, after controlling for performance in year one and year two.

Interestingly, Openness to Experience predicted performance in year two and third year academic course work but failed to predict performance in year one. Again, this may reflect differences in what is being measured by the criterion. Personality traits may be differentially relevant depending on the requirements of the job that they are applied to (Campbell, McHenry & Wise,

1990; Motowidlo & Scotter, 1994). Jobs that require contextual performance such as demonstrating effort, personal discipline, and interpersonal skills may be more related to personality than task performance (McHenry et.al, 1990). Thus, the personality variable may have been better in the prediction of certain components of dental training.

Research Goal Number Four

The study also explored whether broader personality factors or the narrow facets of these factors will be better at predicting performance in dental school. Even though some of the broad factors of personality were not related to success in dentistry, some of the narrow facets of these broad factors were. For example, Extraversion was not related to either of the criterion variables. Nonetheless, one facet of Extraversion, Positive Emotions, was related to clinical course work. Students who were more cheerful and optimistic performed better in clinical components of dental training than those who had less positive emotions. If the narrow facets were not used in the measurement of personality this relationship would not have been detected. Similarly, Neuroticism was not related to any of the criterion variables but Vulnerability, one of the narrow facets of this factor was.

Another example that favors the use of the narrow personality facets involves the broad factor Agreeableness. Straightforwardness was positively related to performance in year two of training, suggesting that those who were more sincere were better performers in year two. Students who were less Compliant performed better in the course work component during year three of

training. This is to say that the students who had more aggressive tendencies and were more likely to be competitive outperformed their peers. Furthermore students who scored lower on Tender-Mindedness, also did better in this component of dental training suggesting that those students who are rational and less moved by appeals to pity will be superior performers throughout this portion of training.

Interestingly, some results also demonstrate how the facets that define the same broad factor can be both positively and negatively related to the same criterion. For example, regarding three narrow facets that define the broad factor of Openness to Experience, Fantasy and Aesthetics were negatively related to overall performance in year three of training where as Ideas was positively related to this criterion.

The use of Openness to Experience, a broad personality measurement, did not improve the prediction of performance in the clinical components of dental training in year three of study. The facets Positive Emotions and ideas, however, accounted for an additional 11 percent of the variance in the clinical criterion. Paunonen and Ashton (2001) report that the variance that is specific to the narrow facets can be diluted when an aggregate measure of personality is used for prediction purposes. The specific facets may have also been more related to the criterion than the broad factors which resulted in the difference in the prediction. These results support the use of the narrow facets for prediction purposes as the narrow facets accounted for more variance in prediction than the broader factor.

Personality measurement can be defined in terms of a hierarchy, with broad traits at the top and the specific facets closer to the bottom (Costa, 1996). For admissions purposes, one would not want to lose important information by choosing to use only the broad traits at the top of this hierarchy as these broad dimensions of personality may be too broad to have predictive utility among applicants to dental school. The results of the study suggest that there is more information to be gained for selection purposes through measurement of the narrow facets of personality.

Limitations of the study

Some of the results reported here might have been due to the small sample size used in the study. For example, the clinical component analysis only included 40 subjects. A larger sample would have been an ideal alternative and may have yielded significant findings where none were detected. Because of the low sample size there may not have been enough power to detect an effect in certain analyses. Assuming a small effect size, the power values for the overall regression analyses were low (approximately .50). If one were to assume a moderate effect size, the power to test the contributions of individual variables in the regression equations is marginal.

Another potential limitation of the current study is the number of correlations that were calculated. The potential for Type I error increases as the number of correlations that are calculated increases. Therefore, error rates of .001 should have been used to control for Type I error. Not controlling for this could

potentially result in some of the relationships amongst the variables that were detected losing significance.

The current study included a self-report measure of personality. There can be negative implications if a test is susceptible to either "faking good" or "faking bad" for personnel selection. This is one potential limitation of the study. This distortion may compromise personality measurement and must be considered seriously (Christiansen, Goffin, Johnston, & Rothstein, 1994). However, studies have shown that criterion related validity is not affected by this distortion (Barrick & Mount,1996; Hough, 1998). For example, Barrick and Mount (1996) examined the impact of self-deception on the predictive ability of personality constructs and concluded that the criterion related validity was not affected. Therefore, in the present study this limitation may not be as powerful as it may be in another study. Furthermore, performance measures were already available when the subjects completed the NEO-PI-R, making it less likely that they would attempt to "fake good" or "fake bad".

Implications

The findings in the current study have serious implications for the use of the current interview for admissions purposes. The initiative to develop a new interview for admissions purposes to Canadian dental schools has been underway since 1997 and a newly developed interview has now become a part of the selection process for the 2001/2002 entering students. Given that the old interview, the one used in this study, was negatively related to dental training performance, a similar study related to the new interview is imperative. The lack

of positive relationships that occurred between the interview and the performance measures are reason enough to support this decision.

The relationship between Openness to Experience and dental school success detected in the current study draws attention to the potential use of personality measurement for dental school admissions purposes. The increased prediction offered by the narrow facets in clinical components of training adds even more strength to their possible use. The findings have practical significance in demonstrating that personality measures can indeed enhance the admissions process by predicting progress in clinical components of the program. Personality measures can provide further information on potential candidates that may be useful in distinguishing between who will pass or fail in the program. Moreover, the personal cost of a dental education, as well as the institutional costs accrued by training a dental student through a four-year curriculum, is reason enough to ensure that selected students are going to succeed through the training process. Use of personality may identify candidates who are likely to drop out in the later stages of the training program.

The results also have practical importance in demonstrating that different combinations of selection procedures can add to the prediction of performance. Examining the validity of various measures in the prediction of performance can be helpful in determining how much weight that measure should be given in the selection decision. Results of the study suggest that the way various predictors are combined can have an impact on the validity of a selection battery.

Future Research

More research examining the joint predictive ability of both personality and general mental ability is needed to assess their utility in predicting academic success. Further research exploring the relationships between personality, structured interviews, and general mental ability with other populations is also needed.

Researchers should seek alternative criterion measures. Academic grades are consistently used in research as a criterion measure, which is only one measure of student performance. In fact, more research on the understanding of performance is needed. To enhance our knowledge of performance in dental training, criterion should be closely examined. Future research needs to examine the link between personality and narrower dental training performance measures. More research aimed at defining narrow criteria will aid in the prediction of success in dental training.

Additional studies should be undertaken to determine the relationship between the personality traits of students and performance in dental school as well as performance in practice. The relationship between personality and performance could be examined longitudinally from the first year of training to practice in the profession. This will help to clarify whether the personality traits that contribute to performance in dental training will remain valid predictors of job performance during a dental career. Another potential area of future research may be to identify those behaviors that cause students to fail or drop out of

training and then seek proper ways to measure them. This is an area of study that may be of particular importance for admission to dental school.

Another interesting area for future research would be to examine the potential interactions that may be present among the variables used in the current study. More complex models may be tested to identify the complete relations that may potentially occur amongst the variables.

Recommendations:

1. The Canadian Dental Association (CDA) should continue with their efforts to implement the newly developed interview for selection to Canadian Dental programs. An in depth examination of the validity and reliability of the new interview should be conducted.

2. The CDA should use non-cognitive measures, such as personality, to provide additional information on a candidate and supplement the predictive validity of the DAT.

3. The CDA should continue to use the DAT as part of the selection process in dental school. However, it would also be beneficial for the CDA to seek alternative measures of cognitive ability that might be better at predicting performance in the later years of dental training.

Conclusions

Results of the current study support the use of personality measures in predicting performance in dental school. The findings suggest that personality can provide important information that can be used in conjunction with other selection devices in the application process. As it is necessary to distinguish

between who will perform well and who will not, admissions officers should be aware of the possible value of applying different techniques in the selection of applicants and of using this knowledge to make more informed and accurate decisions. The importance of these decisions is even more recognizable when an applicant becomes a practicing dentist in our society.

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Appendix A
Saint Mary's University, Department of Psychology
Predicting Success in a Dental Training Program
Informed Consent Form

You are being invited to participate in a research project. The purpose of this study is to determine which, if any, personality traits and behaviors correspond to success in the study and practice of dentistry and how to access these factors at the point of admission into the study of dentistry.

You will be asked to complete a 240-item measure that will assess your own personality traits. This will take approximately 30 minutes of your time. By participating in this study you will have given your permission to use information that exists in your dental school records such as your grade point average and entering interview scores.

There is no potential harm or risk to your personal safety or well-being by participation in this study. The project has the potential of altering the admissions process for Dental school by allowing the use of predictors, which improve upon the success of those currently being used.

Your participation in the study is completely voluntary and you may withdraw from the study at any time. Your future as a student or practitioner will not be affected by whether or not you participate in the study. We will maintain the confidentiality of any information that you provide us during the study. Data gathered from the project will be reported in aggregate form with no identification of any participant. Your name will be recorded only to allow us to link your questionnaire data to dental school records. The results of this project are intended for presentation at conferences and for publication in scholarly journals.

Dr. D. Cunningham is the primary researcher responsible for this project. You may contact him should you have any questions or concerns about your participation in this study. Additionally, you may contact Dr. V. Catano, Chair, Department of Psychology at Saint Mary's University (420-5846) about this project.

I have had the nature of this study explained to me and my questions have been answered to my satisfaction. I hereby consent to participate in this study.

_____   _____   _____
Name (Print)   Signature   Date

APPENDIX B

Correlations among study variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Criterion Variables																					
1. GPA year one	81.74	6.16	-																		
2. GPA year two	79.24	5.58	.42**	-																	
3. Clinical year three	78.07	7.73	.25	.62**	-																
4. Course work three	78.21	8.57	.20	.75*	.43**	-															
5. OGPA year three	78.91	5.78	.35**	.82**	.68**	.90**	-														
Cognitive ability																					
6. DAT academic average	19.42	2.62	.24**	-.04	-.07	-.02	-.03	-													
7. DAT perception	17.84	2.45	.08	.13	.16	.04	.14	.36**	-												
8. DAT reading comp	20.67	3.18	.09	.12	-.08	.25	.15	.63**	.25**	-											
9. DAT chalk carving	19.10	5.07	.08	.02	.08	.19	.14	.29**	.38**	.16*	-										
Personality																					
10. Agreeableness	123.80	19.17	.04	.10	-.02	-.15	-.07	-.19*	-.18*	-.15*	-.15*	-									
11. Neuroticism	80.27	22.91	-.10	.01	.11	.21	.11	-.01	-.04	.04	.01	-.27**	-								
12. Extraversion	124.73	19.43	.01	-.12	.19	-.10	-.07	-.07	.01	-.09	.04	.15*	-.30**	-							
13. Conscientiousness	127.46	18.83	.01	.06	.10	.01	.06	.02	-.04	.00	.04	.26**	-.36**	.09	-						
14. Openness	120.29	18.47	.02	-.18*	-.15*	-.40**	-.26**	-.02	-.02	-.04	-.13	.29*	-.14*	.50**	.06	-					
15. Interview Scores	32.00	3.55	-.17**	.03	.07	.05	-.06	-.21**	-.35**	-.06	-.34**	.21**	-.17	.11	.03	.12	-				

Control Variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
16. Age	25.88	3.45	-.29**	-.21*	-.28*	-.05	-.06	.03	.21**	.02	.06	-.04	-.02	-.10	-.01	-.13	-.01	-			
17. Gender	1.54	.50	-.05	.06	-.03	.18	.13	-.18*	-.15*	.08	-.21*	.14*	.28**	.03	-.02	.17*	.11	-.27**	-		
18. Year of Study	2.40	1.09	-.16*	.05	.10	.23	.13	.08	.13	.08	.09	-.13	.27**	-.02	-.21*	-.11	-.26**	.37**	-.05	-	
19. School	1.37	.48	.07	-.14	.13	.09	.06	.51**	.41**	.35**	.43**	-.27**	.16*	.04	.07	-.11	-.52**	.08	-.10	.25**	-

Note: **p<.01, *p<.05
One-tailed test