A Standardized Open-Ended Questionnaire as a Substitute for a Personal Interview in Dental Admissions

Naomi Gafni, M.A., Ph.D.; Avital Moshinsky, M.A.; Jaime Kapitulnik, M.Sc., Ph.D.

Abstract: This paper discusses the need for reliable and valid measures of personality and motivational factors in the prediction of success and attrition in a dental school. The admissions system currently used in most schools includes personality factors that are measured by an interview. Our study examined whether the interview could be replaced by a standardized, open-ended questionnaire, thus increasing standardization and objectivity and avoiding the possible biases of the interview. The relationship between the standardized questionnaire score and the interview score in a dental school in Israel was examined, as well as the relationship between the standardized questionnaire score and the admissions decisions. The results showed that the questionnaire and the interview probably measure a common construct, enabling us to tentatively recommend a two-stage admissions process: all candidates meeting certain academic criteria should be asked to answer the questionnaire; those candidates scoring above a certain percentile on the questionnaire should either be admitted outright or invited for an interview.

Dr. Gafni is Director of Research and Development, the National Institute for Testing and Evaluation, Jerusalem; Ms. Moshinsky is Head of Computerized Testing, the National Institute for Testing and Evaluation, Jerusalem; and Dr. Kapitulnik is Chairman, Admissions Committee, Faculty of Medical Medicine, the Hebrew University of Jerusalem. Direct correspondence and requests for reprints to Dr. Naomi Gafni, P.O. 26015, Jerusalem, Israel 91260; 972-2-6759506 phone; 972-2-6759543 fax; Naomi@nite.org.il.

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The interview is one of the selection techniques most widely used in the medical and dental school admission process. Over 95 percent of schools interview candidates as part of their selection process for admission, and nearly all of them conduct semistructured interviews with all candidates. Interview ratings ranked first in importance among five preadmission variables in selecting candidates. Interview processes, Johnson and Edwards also found that most of these processes were structured loosely (providing a minimum of guidelines for interviewers) to moderately (providing some guidelines for interviewers). Interviewers were free to ask most questions: they may have been given a list of desirable characteristics or questions to be used as a guide, but formally derived applicant characteristics were not the norm. The questions tended to address the applicants’ educational, economic, and social background, experience and knowledge of the profession, source of motivation, interpersonal behavior or manner, responsibility and commitment, and achievements. Forty percent of those responding reported not using any scale; evaluation was informal. Another 35 percent used simple Likert-type scales for each characteristic that was
examined, anchored by simple adjectives and numerical values at each level. Only a few schools (6 percent) used behaviorally anchored rating scales, with behavioral examples anchoring numerical levels.

Regarding summary ratings, Johnson and Edwards, confirming Puryear and Lewis’s results, found that most interviewers were required to provide a subjective narrative statement or an accept/reject/conditional type of rating. Sixty percent of medical schools required interviewers to submit reports that addressed a series of general topics (e.g., experience and knowledge of the profession, source of motivation for medicine, etc.), but 39 percent of the schools required only an open-ended summary, thereby leaving the exact content of the report entirely to the discretion of the interviewer.

Elam et al. found a general lack of comparability of recorded material across interviewers. Some interviewers include a great deal of information, while others make one-word judgments. In addition to the subjectivity of the interview judgments, the interpersonal setting of the interview is likely to produce biases due to the different cultural backgrounds of the candidates and the interviewers. Even when the interview is structured, it is likely to be affected by different styles of interviewing.

Johnson and Edwards suggested a number of ways in which interviews can be structured to improve their psychometric qualities. Based upon the student selection research of Campion et al. and Edwards et al., they described four elements that are essential to a well-structured admission interview: 1) a systemic job analysis, or Success Analysis of Medical Students, which generates necessary applicant characteristics; 2) standard questions derived from the job analysis; 3) behaviorally anchored rating scales to measure each characteristic; and 4) use of an interview panel instead of one-on-one interviews.

The issue of whether a selection interview can be replaced by an objective measure was examined by Tubiana and Ben-Shakhar. They investigated the results of replacing the interview used by the Israeli Defense Forces to measure the motivation of soldiers to serve in a combat unit using a standardized open-ended questionnaire. The expectation was that the replacement of the interview with the questionnaire would not reduce the general validity of the classification system. The results of their study showed that the interview and the questionnaire were essentially equivalent predictors of the criterion.

This paper deals with the process of admissions to a dental school that faces a serious problem of student attrition. Attrition occurs for various reasons, in particular regarding motivational and personality factors. Another factor contributing to the high rate of attrition is the fact that dentistry is not a graduate program in Israel. If students enter dental school after high school, they have no opportunity to mature into the role of a student of higher education before they begin their dental studies. It was clear to many of the faculty members at the school that any valid measure for predicting success as well as attrition in the dental school must include personality and motivational factors.

The goal of the present study was to examine the effects of replacing the interview with a standardized open-ended group questionnaire. The hope was that this would increase standardization and objectivity, avoid the possible biases of the interview, and save time, manpower, and effort, all without any loss to predictive validity. The questionnaire that was developed was based on the following principles: 1) it had to cover about the same content as the interview, and 2) it had to be objective and easy to score.

An appropriate criterion for validating such a system would be a measure of the scholastic and clinical performance of the admitted students during the course of their studies. However, no such measures were available at the time the study was conducted (the subjects of this research were admitted during the two years preceding the study and such data are not available until the end of the fourth year of studies). Instead, it was decided to examine the relationship between the standardized questionnaire score and the interview score, as well as the relationship between the standardized questionnaire score and the admissions decisions (based on the interview for qualified candidates). These relationships would provide some evidence regarding the extent to which the questionnaire could serve as a replacement for the interview in the future. It is important to note that the questionnaire evaluation had no bearing on the actual admissions decisions in question. The questionnaire was employed solely on an experimental basis with an eye to future use.

The Current Admissions Process in Israel

In Israel, dental school studies start from the first year of undergraduate studies (in contrast to the
United States, where dental schools are graduate schools). At present, the dental schools base their admissions decisions on the following measures:

1. A scholastic aptitude measure that is a weighted score of two measures: the average score on the high school matriculation diploma (based on high school teachers’ evaluation of students’ scholastic achievement in various subjects and on national exams administered by the Ministry of Education) and the score on the Psychometric Entrance Test (PET), which is a scholastic assessment test (similar to the U.S. Scholastic Assessment Test, SAT).

2. An interview intended to measure personality factors. The interview is individually administered to candidates who exceed a certain cutoff score (a very high one) on the cognitive ability measure mentioned above.

The interview is conducted by two faculty members and a psychologist and lasts for about forty minutes. The goal of the interview is to identify those candidates whose personality does not seem to be suitable for dental studies. The outcome of this interview is a general evaluation of the candidate on a scale of 1 to 5. A candidate is rejected if all three interviewers assign to him a score of 1; a candidate is invited for a second interview if two of the interviewers assign to him a score of 1; otherwise, a candidate is admitted (the 1 to 5 scale was adopted assuming that it is easier to rate candidates on a continuum rather than in a dichotomous fashion and to achieve a more accurate estimation of validity of the interview evaluation). Ten to 20 percent of the qualified candidates are rejected based on the interview.

**Method**

The construction of the questionnaire included Johnson and Edwards’ elements essential to the construction of a completely structured admission interview. A small-scale job analysis was conducted among various groups of dentists: faculty members, practicing dentists, dentists who had left the profession, dentists who expressed satisfaction with their profession, and dental students. The analysis was performed on data collected during interviews with these dentists and dental students. They were asked to identify what traits are required to be a successful dental student, as well as what traits are required for success as a dental practitioner. In addition, they were asked what they liked and disliked about their studies and work. Standard questions derived from the job analysis were formulated.

Additional questions included in the questionnaire were selected from a list of questions commonly used by interviewers. To be included in the questionnaire, each question had to have a clear rationale regarding what it measured (based on the job analysis). Criteria for scoring each question were based on this rationale, and a detailed scoring guide was developed (see examples in Figure 1). The questionnaire was reviewed by faculty members of the dental school and revised accordingly.

The final version of the questionnaire included twenty-three open-ended questions and was divided into two parts (after two questions had been removed as described below):

1. *Motivation*, experience with and knowledge of the profession (eleven questions); and
2. *Personality* factors, including honesty and credibility, responsibility and commitment, persistence, self-evaluation, interpersonal behavior, promptness and accuracy, and technical skills (twelve questions). Of those questions, some related to the candidate’s past experience (eight), and others were general questions (four).

Following administration of the questionnaire to candidates, a training workshop was conducted during which six raters discussed and agreed on the final criteria for each question. Only questions for which clear scoring instructions could be written and that had a high degree of interrater agreement were included in the final score. It was not possible to formulate a clear scoring guide for two questions, so these were excluded from the questionnaire (after which, twenty-three questions remained).

Following this workshop, each question was scored independently by two raters according to the scoring guide. The score on each question was the mean of the two raters’ scores. For each candidate, the following scores were calculated: 1) a total score based on all questions (twenty-three questions); 2) a motivation score based on the first part (eleven questions); and 3) a personality score based on the second part of the questionnaire (twelve questions).

The experimental questionnaire was administered to 296 candidates to the dental school for the academic years 2000 and 2001 who had been invited for an interview (131 candidates in 2000 and 165 candidates in 2001).

Each candidate was asked to fill out the questionnaire before being called in for an interview.
Results

Since the results of the two sets of data (relating to academic years 2000 and 2001) turned out to be highly similar, results are reported for the combined group. Table 1 presents the correlations between the independent evaluations of the two raters for each questionnaire score. The correlations indicate a high degree of agreement between the two raters. The internal reliability of the questionnaire was calculated using Cronbach’s Alpha coefficient. Table 2 presents the reliability coefficients of the questionnaire scores.

Given that the questions are open-ended and subjective, we consider that the resulting reliabilities are reasonable. The correlation between the Motivation and Personality scores was .52, between the total score and the Motivation score .84, and between the total score on the questionnaire and the Personality score .90. The last two correlations indicate that the two parts of the questionnaire bear approximately equal weight in determining the total score on the questionnaire.

Table 3 presents the mean, standard deviation, minimum, and maximum of the variables included in the study. As expected, the standard deviations of the matriculation grades (.51) and PET scores (32.4) within this selective group of candidates are quite small compared with those in the general population of applicants to the universities, which are .77 and 100 for the matriculation grades and PET scores, respectively.

The Interview Score

The interview score was defined as the sum of the three interviewers’ scores following the first interview (when there was more than one interview). The correlations between the interview score and the other variables are presented in Table 4.

As expected, the correlations of the interview score with the cognitive measures (the PET and

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<th>Table 1. Interrater correlations for each questionnaire score</th>
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<th>Table 2. Cronbach’s Alpha coefficient for the various questionnaire scores</th>
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Matriculation scores were relatively low. Moderate correlations were found between the interview score and the questionnaire scores (Motivation, .33; Personality, .31; and total score, .40), indicating that the traits being measured share common variability.

### Relationship Between the Questionnaire Scores and Other Scores

Table 3 presents the descriptive statistics for the questionnaire scores, matriculation grades, and PET. The correlations between the interview score and other scores are shown in Table 4. Table 5 correlates the total score on the questionnaire with other variables.

Distribution of Rejection Decisions by Questionnaire Score

An examination of the distribution of rejection decisions by questionnaire score provides another perspective on the relationship between the interview and the questionnaire. All in all, 296 candidates were interviewed, of whom forty-nine were rejected. Table 6 presents the number of rejected applicants by their percentile score on the questionnaire.

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All candidates who scored within the top 10 percent on the questionnaire were admitted (based on the interview). On the other hand, eleven candidates (23 percent of the rejected candidates) were rejected from among those who scored within the top 10 percent.
bottom 10 percent. Of those who scored above the 60 percentile score, only six were rejected. The remaining forty-three rejections were of candidates who scored below this score.

Discussion and Summary

Our study examined whether an admissions interview could be replaced by a standardized open-ended questionnaire, thus increasing standardization and objectivity and avoiding the possible biases of the interview. The results suggest that the interview and the questionnaire might be fairly equivalent indicators of the motivational and personality factors they measure. To be able to make a more confident statement regarding this equivalence, some clinical performance criteria are needed. Nevertheless, the results of this study suggest that the questionnaire might be an adequate prescreening tool. It might save interviewers substantial amounts of time by allowing them to interview a smaller number of candidates, while the cost in validity is probably small to negligible.

The results enable us to make a tentative recommendation for policymakers regarding admissions decisions. The recommendation is to conduct the admission process in two stages: first, have qualified candidates fill out the questionnaire. After the questionnaires have been scored and a cut-off score has been defined (e.g., the 60th percentile score), a decision should be made as to whether to admit a candidate directly or to invite him or her for an interview. Choosing a high rather than low cutoff score means that more candidates will be interviewed.

More data are being collected and analyzed regarding candidates admitted for the academic years 2000 and 2001. It is hoped that these data will provide us with more evidence regarding other variables, such as future academic and clinical performance.

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REFERENCES