On the use of personality characteristics in predicting compliance in orthodontic practice

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Cooperation of the patient during orthodontic treatment is a major determinant of a successful treatment result. Unfortunately, noncompliance is a serious problem in orthodontics. A patient’s noncompliance can result in a longer treatment time, destruction of the teeth and periodontium, extraction of additional teeth, collapse of a corrected malocclusion after treatment, frustration for the patient, and additional stress for the orthodontist and staff.1

Predicting patient compliance could be helpful in anticipating problems that might arise during orthodontic treatment. In previous studies, it has been hypothesized that personality traits might at least partly determine a patient’s motivation for orthodontic treatment,2 as well as adherence with health guidelines in general.3 For example, Allan and Hodgson4 characterized cooperative orthodontic patients as enthusiastic, energetic, self-controlled, responsible, and obliging. Uncooperative patients were typified as hard-headed, temperamental, impatient, individualistic, and intolerant of prolonged effort. More recently, it has been stated that high-need achievers cooperate better orthodontically than do low-need achievers, that high-need affiliators cooperate better than low-need affiliators, and that internally motivated patients cooperate better than externally motivated patients.5,6 Furthermore, it has been suggested that orthodontic patients who are obedient, have high self-esteem, and are accommodating comply better than do patients who are nervous, agitated, passive, introverted, and dominating.7

However, other studies that used personality variables to predict adherence during orthodontic treatment have been unsuccessful in obtaining a clear answer or have found contradicting results. For instance, Nanda and Kierl8 reported that neither attitude toward orthodontic treatment, need for approval, nor need for achievement was a significant predictor for a patient’s cooperation in orthodontic treatment. Albino et al9 found that variables such as anxiety, self-concept, social desirability, and need for achievement do not appear to have great value in predicting adolescent orthodontic cooperation.

Results of empirical studies so far are often statistically nonsignificant or at best inconsistent. Of course, part of these disappointing findings might be due to the research methods used. Most estimates of adherence are based on feedback from patients in orthodontic treatment. These samples could be biased because the patients are “ill” and have a vested interest in appearing compliant.10 Moreover, orthodontists and their patients readily overestimate patient adherence.11,12 In the present study, an additional effort to assess the impact of personality aspects on patient compliance is presented, this time using less-biased healthy subjects who had recently received orthodontic treatment.

MATERIAL AND METHODS

The general adherence scale (GAS), developed in 1987,13 was used to assess subjects’ adherence to medical recommendations in general. In the present study, a modified scale (GASM) was also developed to measure subjects’ adherence to recommendations in orthodontic practice. One hundred six first-year psychology students at the University of Amsterdam with recent orthodontic experience (75 women, 31 men; mean age 20.1 years; SD 3.25 years) completed the GAS and the GASM. All students also completed another test, “De Vijf Persoonlijkheidsfactoren” (5PFT), and 75 of them completed the prestatic motivation test (PMT).

The GAS was translated into Dutch by 2 independent translators. The 5 items were slightly adapted to fit the pool of subjects. The original GAS was designed for patients under treatment, but, because our subjects were healthy and 75% of our sample was not under treatment at the time of the study, the fifth item (“Generally speaking, how often during the past 4

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weeks were you able to do what the doctor told you?”) was suggested from our analyses. The other 4 items were (1) “I had a hard time doing what the doctor suggested I do,” (2) “I found it easy to do the things my doctor suggested,” (3) “I was unable to do what was necessary to follow my doctor’s treatment plans,” and (4) “I followed my doctor’s suggestions exactly.”

The GAS items were answered on a 5-point scale, ranging from “none of the time” to “all of the time.” After reversing the scores of items 1 and 3 (because they were negative statements), we obtained an overall compliance score by summing the scores of items 1 through 4. After the assessment of general adherence, subjects completed the GASM, in which “doctor” was changed to “orthodontist.”

Furthermore, all subjects completed the 5PFT.14 This test consists of 5 subscales (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience), and each subscale contains 14 items. Each item briefly described a personality trait, eg, “reads a lot and has a broad intellectual interest.” Subjects indicated on a 7-point scale whether this description was appropriate for themselves.

Also, subjects completed the PMT scale.15 It contains 90 items divided into 3 subscales (achievement motivation, facilitating anxiety, and debilitating anxiety). Every item was formulated in a statement (eg, “I think a life in which one does not have to work at all would be . . .”). Items were answered on a 2-point, 3-point, or 4-point scale.

To investigate to what degree subjects’ tendencies to comply could be predicted by their personality traits, 2 regression analyses were performed. As predictors, the 8 personality traits measured by the 5PFT and the PMT scales were used, as well as age and sex. As criterion variables, the sum scores on both adherence scales were used.

**RESULTS AND DISCUSSION**

On the GAS, the mean score was 16.04 (SD 2.92). On the GASM, the mean score was 14.29 (SD 3.34). Because the maximum mean score on each scale is 20, and both mean scores are far above 10, it can be concluded that subjects on both scales have a tendency toward adherent behavior. However, it seems that the subjects were somewhat less inclined to follow the orthodontists’ recommendations, because the mean score of the GASM is lower than that of the GAS. The reliability of both versions is satisfactory (Cronbach’s α, .87 and .80).

The reliability of the subscales of the 5PFT and the PMT is also satisfactory; Cronbach’s α varies from .74 to .85. Significant correlations were found between different personality traits but not between personality traits and the general adherence scales. Correlations between personality traits and adherence ranged from .01 to .17.

The results of the regression analyses confirm this outcome, as shown in the Table.

The present results once more suggest that personality traits alone cannot predict compliant behavior in orthodontics to a clinically useful level. In measuring compliance, other variables in addition to personality characteristics seem to be involved. It is important to use or construct valid and reliable instruments and to use objective measures of compliance to raise the reliability and validity of compliance studies.

The GAS, which has also been used in previous studies, scored high on reliability. In a previous study,16 the dental attitudes questionnaire was examined and also found to be a reliable instrument. From a methodologic point of view, using different measurements might increase the validity of compliance scores.

Furthermore, a comparison of results of different samples might increase the validity of compliance studies. In the present study, ex-patients with a mean age of 20.1 years were used. This student sample was relatively homogeneous with respect to dental health, and the members generally have good dental habits.17 This group cannot be compared with a group of current patients, who are mostly younger than 16 years of age. However, our results could be compared with results obtained with other groups of orthodontic ex-patients to increase the external validity of our findings.

**Table.** Results from regression analyses with GAS and GASM as criterion variables and 5PFT and PMT scales, sex, and age as predictors

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<thead>
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<td>.83</td>
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<td>.90</td>
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<tr>
<td>C-5PFT</td>
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<td>R²</td>
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*Note: β, standardized b coefficient.

R², Percentage explained variance.
inconsistent findings of previous studies, we conclude that the assumption that patients’ personality characteristics alone enable us to predict their compliance to a clinically useful degree is no longer tenable.

REFERENCES