The Dental Appointment and Patient Behavior
Differences in Patient and Practitioner Preferences, Patient Satisfaction, and Adherence

RICK S. ZIMMERMAN, PHD

Although the quantity and, in many cases, the quality of research on the practitioner-patient interaction has improved over the last 10–15 years, many related topics remain largely unexplored. The relationship of the similarity of practitioner and patient preferences to treatment adherence has not been carefully investigated, either in a medical or dental setting. This paper presents a study of patient and practitioner preferences for a dental appointment, and assesses the impact of their similarity on patient satisfaction with the appointment and adherence to the recommended treatment regimen. Results indicate that the similarity of patient and dental student preferences for an appointment is a very significant predictor of patient satisfaction with the appointment, reported improvement in oral hygiene behavior, and actual improvement in objective dental health. Patient satisfaction was, in turn, an independent predictor of reported behavior change and objective improvement in dental health. Similarity of patient and practitioner preferences for appointments should be studied more carefully in future doctor- and dentist-patient interaction research, as it is a critical variable for understanding how the interaction experience is translated into patient behavior. Key words: expectations; dentistry; dentist-patient relationship; patient satisfaction; health education; compliance. (Med Care 1988; 26:403–414)

The last two decades have seen an ever-expanding group of researchers in a variety of disciplines studying the practitioner-patient interaction more frequently and in much greater depth than in the past. One substantive area of practitioner-patient research that has received only occasional coverage, however, is that of the similarity of expectations or preferences or both held by the practitioner and patient. Before entering a relationship, both patient and practitioner have expectations of and preferences for the type of relationship they will enjoy and the outcomes that will result from their partnership. The two sets of information often differ considerably and go uncommunicated.1-3 And since the practitioner is substantially in control of the interaction,4-5 the substance of the appointment is likely to conform closely to his or her preferences and expectations. Thus, to the extent that patient and practitioner preferences and expectations differ, the patient might

From the Department of Sociology, University of Miami, Coral Gables, Florida.

Partial support for supplies and materials was received from National Institute of Mental Health (NIMH) Social Science Research Training Grant #MH07414 to David Mechanic.

Address correspondence to: Professor Rick Zimmerman, Department of Sociology, University of Miami, P.O. Box 248162, Coral Gables, FL 33124.
ultimately be dissatisfied with his or her care. Only a few studies to date have directly assessed the importance of the similarity of expectations or preferences.

The classic study of the effect of the match between patients’ expectations about appointments and the actual care received during the appointment was conducted by Korsch and her associates. The research group studied tape recordings of 800 interactions of physicians with pediatric patients and their mothers. Additional data were provided by interviews with mothers immediately after the appointment and 1 week later. Mothers for whom any of a variety of (retrospectively reported) expectations were unmet during the appointment were less satisfied than those for whom all expectations were met. Furthermore, the greater the number of unmet expectations, the less the mothers reported that they had adhered to the treatment regimen. The authors concluded that unmet expectations led to dissatisfaction. Of course, the mothers’ feelings of dissatisfaction may alternatively have influenced their (subsequent) reports of unmet expectations. Accuracy of their compliance reports may also have been influenced by their dissatisfaction.

Several more recent studies have assessed the impact of some sort of patient–practitioner agreement on satisfaction or patient adherence behavior, or both. In one study, if patients and practitioners agreed on the reasons for a return visit, patients were more likely to report for their next scheduled visit; in another study, if the two parties agreed on the principal problem of interest, the practitioner was more likely to report that the patient’s condition had improved “a lot.” Nathanson and Becker found that female teenaged clients reported greater rates of compliance with their oral contraceptive regimen if they went to clinics where clients and nurses generally agreed on the acceptability of occasional dependence of clients on nurses than where there was disagreement on the appropriate level of client independence. Eisenhal et al. have shown that mental health patients were more likely to be satisfied with their care if they perceived that they were involved in the “negotiation” of the treatment plan. In short, similarity of provider and patient concerns and expectations for the appointment seem to be related to patient feelings about the interactions and patient adherence behavior.

Before proceeding, an important distinction must be made among several terms, often used incorrectly, related to expectations. “Expectations” concern what an individual thinks is likely to happen. I would like to use the term “preferences” for what the individual would like to happen. It seems at least plausible that the patient’s preferences (the desired behaviors of and relationship with the dentist) are likely to be more important than expectations (the anticipated behaviors and relationship) in the patient’s evaluation of the success of the interaction. If the dental practitioner does what the patient wanted in the appointment (i.e., the appointment coincided with preferences) but does not live up to some ideal expectations, the patient is likely to be satisfied. Conversely, if the practitioner does exactly what the patient expected him or her to do but does not do what the patient wanted in the appointment, the patient is likely to be dissatisfied. Thus, I will focus more appropriately on patient preferences rather than on expectations.

In addition to the relative neglect of patient preferences as an important variable of study, until only the last several years, the dentist’s office had been largely neglected as a locale for studying the patient–practitioner interaction. Indeed, until about 1981, most of the published suggestions about the dentist–patient relationship had been based on individual dentists’ experience rather than systematic empirical evidence. The few studies that had been conducted were of an exploratory nature and as such did not provide much insight into the dentist–patient interaction particularly as it does not have many people visit the dentist altogether. Search that has focused on dentists assessing predict patient’s point of view. In recent years, the behavioral science has entered the dental office as a discipline. In dentistry, the anxiety during entering the office is discovered frequently and anxiety in dentists don’t patients like it. A relative study was randomly conducted by a dentist’s office and with a communicative interese group than those with whom they in a community.

While these patient relations are over evaluations weaknesses remain. Anxiety, dentist satisfaction are pr
interaction process. This is quite remarkable, as it is no secret that our society does not have a love affair with dentists. For many people, anxiety is a central part of the visit to the dentist, and it delays many visits altogether. The only program of research that had moved beyond conjecture focused on determining which patients are anxious and why they are anxious, without looking at the content of the interaction per se.

Recent research has begun to determine empirically some of the variables that are critical to an understanding of the dentist-patient relationship. Dental patients have preferences for the appointment—they like dentists to explain the treatment fully and tell them what to expect during the appointment. In fact, patients report that their current dentists exhibit these characteristics more than dentists they have chosen to leave in the past. Corah and associates have conducted several important studies to assess predictors of anxiety and patient satisfaction. In one study, they showed that dentist behaviors are related to patient satisfaction and that the best predictor of patient anxiety during treatment is anxiety when entering the office; in another study, they discovered that “talking” is the most frequently used technique to reduce patient anxiety; in a third study, they found that dentists don’t act very differently with patients they like than with patients they don’t like. A related, experimental study was conducted by Gale et al. in which patients were randomly assigned to either a communicative or a noncommunicative interaction with a dentist. Those in the noncommunicative interaction were less satisfied than those whose dentists interacted with them in a communicative manner.

While these recent studies on the dentist-patient relationship mark a significant advance over earlier work, several gaps and weaknesses remain. First, although patient anxiety, dentist behaviors, and patient satisfaction are presumed in Corah et al.’s model to be related to compliance by the patient, the relationship of these variables to compliance has not been empirically verified, and the importance of similarity of patient and dentist preference has not been assessed. Second, dental procedures conducted during appointments varied considerably within most of the studies; thus, variation in both dentist behaviors and patient satisfaction in a given study could be due in large part to what procedure was being performed in the appointment, leading to spurious correlations between dentist behaviors and patient satisfaction. Third, in the one study that clearly attempted to assess the relationship of the interaction content to patient satisfaction, the dentist behavior items (the independent variables) resembled greatly the satisfaction items (dependent variable), making interpretation of the correlations between the two sets of variables (about 80% of correlations were significant, with average values of 0.25) difficult.

This study focuses on the similarity of patient and practitioner preferences and its impact on dentist-patient interaction. Similarity of preferences was studied here directly, with patients being asked about their preferences before the appointment and about their satisfaction with it afterward; practitioners’ preferences were also measured. Patients’ intended, reported, and objective adherence was also assessed, in order to see the possible effects of preference differences and satisfaction on patient behavior.

Methods

Setting

The study was conducted in a preventive dentistry clinic in a midwestern dental school. Patients seen in the preventive clinic soon will be having surgery on their gums or having their teeth cleaned and checked. Both sets of patients are sent first to the preventive clinic, where they are taught how to take better care of their teeth before any restorative or periodontal work is done.
During the first preventive clinic appointment, the student asks the patient questions about his or her medical and dental histories and helps the patient begin a 5-day diet diary. Next, the dental student examines the oral cavity and scores the patient on a gingival (gum) inflammation index in which six particular teeth are tested. Then, the student shows the patient how to brush and floss properly and explains the dynamics of plaque formation. The patient then demonstrates his or her knowledge of the newly learned brushing and flossing techniques. After being reminded to mail in the 5-day diet survey, the patient is given a new toothbrush, some floss, and a few plaque-disclosing tablets. The follow-up preventive appointment is then scheduled.

During the follow-up appointment, 7–10 days later, the diet diary and brushing and flossing techniques are reviewed, the student scores the patient once again on the gingival inflammation index, and the patient and student discuss the future treatment plan.

Sample

During the time period of the study, 135 first preventive appointments were scheduled with third-year dental students. Of these, 58 were not listed in the clinic appointment book, the only source of information about upcoming appointments, leaving 77 potential subjects for the study. Four could not be reached after several attempts, and one refused to be interviewed; the remaining 72 patients were included in the study. The demographic distribution of the sample of patients was similar to that of the urban area in which the study was conducted. Most (85%) were white, the rest black; most (64%) were female; age ranged from 15–79, with a mean of 37.2. Half were married, half unmarried. Years of education for the group ranged from 8–20, with a mean of 14.2 years. The mean number of decayed teeth for the patients was 2.1, higher than the national average of 1.2, but lower than the average of 3.5 for persons determined to need an appointment "at an early date". Of the 72 patients in the study, 54 returned for their followup appointment. There were no significant demographic or dental health differences between those who did not return for their appointments and those who remained for the duration of the study.

Of the 142 third-year dental school students, 124 returned the five-page questionnaire sent them. On the whole, they comprised a very homogeneous group: 95% male, 97% white (the rest, Asian); age ranging from 22–32 years, with a mean of 24.7. Special emphasis will be given to the 49 of the 124 students who treated the patients in the study. This subset of the students was not different from the excluded 75 students on any of the demographic variables or on any of the major independent or mediating variables to be discussed in this paper.

Procedure

Each of the 72 patients was interviewed for 10 minutes on the phone, 3–7 days before his or her first preventive clinic appointment. The interview included questions about recent dental health experience, current dental health satisfaction with the dental clinic to date, and faith in dentists. The patients were then asked to rate the importance of different aspects of student behavior during the appointment (i.e., their preferences for the appointment) and, finally, to answer some background questions.

After the first preventive appointment, patients rated their satisfaction with the appointment on the same dimensions on which they had rated their preferences earlier. They also indicated the extent to which they intended to change a number of their oral hygiene habits.

The dental students received a written questionnaire after their first few appoint-
ments with patients in this clinic (including the ones in this study). The questionnaire assessed students’ ratings of the importance of the various aspects of the appointment (the same elements assessed in the patients’ questionnaire) and asked for the same background information as patients had provided during the phone interview.

Measures

Importance Ratings. In order to determine the critical dimensions of the interaction, before embarking on the study, I spent a considerable amount of time in the clinic observing appointments and talking to the faculty, patients, and dental students about their feelings related to the interaction. Dimensions ultimately chosen were those that corresponded to dimensions selected for inclusion in the patient satisfaction scale (see below). Both patients and students were asked how important they felt it was that the dental student 1) be friendly, 2) take care in explaining the patient’s condition, 3) listen to the patient’s thoughts and feelings, 4) joke around, 5) be thorough, 6) spend enough time, 7) explain all procedures, 8) help ease the patient’s fears, 9) have a good sense of humor, 10) answer all questions, 11) show proper flossing and brushing techniques, 12) discuss possible dietary changes, 13) do something to treat the patient’s teeth and gums, and 14) give careful instructions about what the patient should do. Each aspect of the student’s behavior was judged for its importance on a five-point scale, from “not important at all” to “extremely important.”

Difference in importance (preference) scores were then computed as indicators of the extent to which each patient and his or her student differed on their ratings. Since it was hypothesized that difference in either direction (i.e., the student rating an item as more important than the patient did or the patient rating it as more important than the student did) would play a significant role in patient dissatisfaction, the absolute value of the difference between the student’s score and the patient’s score was used. Thus, equal student–patient discrepancies, regardless of the direction of the discrepancies, were weighted equally. Each of the 72 dental student–patient pairs received a difference of importance score, ranging from 0–4, on each of the 14 student behaviors rated.

Factor analysis yielded three subscales of the difference in preference ratings: 1) the “difference in affective preferences” scale, the sum of patient–student differences in preference ratings for friendliness, listening to the patient’s thoughts and feelings, and joking (Cronbach’s alpha for the subscale is 0.62); 2) the “difference in cognitive preferences” scale, the sum of differences in preference ratings for care in explaining the condition, explaining all procedures, and easing the patient’s fear (alpha = 0.38); and 3) the “difference in behavioral preferences” scale, the sum of patient–student differences in ratings for showing proper flossing and brushing techniques, discussing possible dietary changes, and giving careful instructions for what the patient should do (alpha = 0.70). The “total difference in preferences” scale, the sum of six items, includes only those in the more reliable affective and behavioral subscales. Its reliability (alpha) is 0.71.

Patient Satisfaction. The Wolf et al. Medical Interview Satisfaction Scale was adapted for use in this study. It was selected over the Davies and Ware Dental Satisfaction Questionnaire for two reasons. First, the focus and detail of the Wolf et al. scale were more appropriate for this study. Whereas the 19-item Davies and Ware questionnaire tapped multiple dimensions concerning the dentist’s office (including cost, availability, and convenience), the original 26-item Wolf et al. scale focused entirely on subcomponents of the quality dimension, the topic of this study. Second, the Davies and Ware questionnaire was developed to assess feelings about dentists in
general rather than about a particular dentist or, more specifically, interaction with that dentist.

Items with the highest factor loadings were selected from the affective, cognitive, and behavioral satisfaction subscales, yielding 17 items; these were reworded as necessary to apply to this particular dental setting. For the 17 items, three subscales were created, based on Wolf et al.'s results and factor analyses of the present data. The "affective satisfaction scale," composed of five items, has a reliability alpha of 0.86; the "cognitive satisfaction scale," also composed of five items, has alpha = 0.84; the "behavioral satisfaction scale" includes four items and has a coefficient alpha of 0.69. The total satisfaction scale, composed of 13 items (all of those included in the subscales except satisfaction with amount of time spent—the least reliable item included in the subscales), has a reliability coefficient of 0.90. Since the development of these subscales by the author, Wolf et al.'s scale has been adapted for the dentist—patient interaction in several other studies, resulting in three subscales quite similar to those used here.29,34

Oral Hygiene Behavior. After the first preventive clinic appointment, patients also indicated the likelihood of undertaking six actions during the next week—switching toothpastes, using the plaque-indicating tablets they were given, starting to floss or flossing more, starting to brush or brushing more, using a different brushing method, and eating fewer sweets. Each was rated on a three-point scale: "I probably will," "I might," or "I probably won't." Based on factor analysis, three of the items (using disclosing tablets, flossing more, and brushing more) were added to form a behavioral intention scale (alpha = 0.64).

After their follow-up appointment a week or so later, the patients were given the same three choices about whether they would be involved in those behavior changes in the future, as well as a choice indicating they "already have [changed the behavior] since [their] last appointment." The three comparable items from the behavioral intention scale, as well as two items concerning eating less sugar and using a different brushing method, were combined to form a reported behavior change scale (alpha = 0.65).

Dental Health. The total Gingival Inflammation Score (GIS), assessed both at the first and follow-up preventive appointments, was used as a measure of objective dental health. This score is similar to but simpler to record accurately than the Simplified Oral Hygiene Index (OHl-S).37 For the GIS, the gingival (gum) surfaces of each of the six tested teeth are divided into four regions, and each is probed for signs of inflammation (score of 1) or bleeding (score of 2). The scores are summed to yield the Gingival Inflammation Score, which can range from 0 (no inflammation on any of the teeth) to 48 (bleeding on all four surfaces of each of the six teeth).

The GIS was found to have good convergent validity as well as test-retest reliability. Correlations with measures of gum problems, condition of teeth, plaque on teeth, calculus formed on teeth, and frequency of patient flossing (all assessed by a different student a few weeks earlier) averaged 0.38, with all relationships significant at \( P < 0.025 \). The test-retest reliability coefficient (Pearson's \( r \)) for the GIS over a 1-week interval was 0.72.

Results

Patient-Student Preference Differences

As can be seen in Table 1, the mean absolute difference on the 14 preference items ranged from 0.46 on the importance of answering questions and of a complete, thorough job (on a five-point scale, a difference of about one standard deviation for each variable) to 1.95 on the importance of listening to the patient's thoughts and feelings (nearly two standard deviations). Listening to the patient's thoughts and feelings was viewed as more important by the students than it was by the dentist.

8 (out of 14 ranks was by the two stratified students ranked in the other way. Since the explanation was to be read (as mentioned), the respondents should do their own teeth to be told what to do. The reasoning is that students feel they teach the patients their own teeth. On the other hand, students have the ability for their students. Results

\[ \text{Results} \]

\[ \text{Patient-Student Preference Differences} \]

\[ \text{As can be seen in Table 1, the mean absolute difference on the 14 preference items ranged from 0.46 on the importance of answering questions and of a complete, thorough job (on a five-point scale, a difference of about one standard deviation for each variable) to 1.95 on the importance of listening to the patient’s thoughts and feelings (nearly two standard deviations). Listening to the patient’s thoughts and feelings was viewed as more important by the students than it was by the dentist.} \]
behavior] since the three comparative intention concerning eating and brushing (from a reported value of 0.65).

Gingival Involvement both at initial appoint-ments and at objective signs of bleeding (score of yield the Gini

The mean overall reliability of gum probing on teeth, and frequency of by a different averaged was 0.38, signif-icant at the 0.01 level. A one-week test-retest reliability. The mean preference items were not complete, therefore, a difference was noted for each preference (importance of listening and feeling). Listening to feelings was by the students than it was by the patients: its rank of importance for the students was 4; for patient, 8 (out of 9). Another large difference in ranks was found for the importance placed by the two groups on the students' demonstration of flossing and brushing; it was ranked only fifth in importance by patients but second by students. Students also saw the explanation of everything they were doing to be less important than the patient did (as measured by ranks), and patients saw receiving instructions on what they should do to improve the condition of their teeth to be less important than the students did.

The general picture is one in which students feel it is more important that they teach the patients how to do things for their own teeth, while patients would prefer to have the dental students take the responsibility for improving the condition of their teeth. Results concerning the importance of interpersonal skills are mixed: for some items (e.g., the student's helping him or her feel less worried), the patients rate the behavior as more important; for others (e.g., listening to the patient's thoughts and a sense of humor), the students rate the behavior as more important. For the remainder of the items, either student and patient ranks were nearly equal or the mean absolute difference was quite small.

**Difference in Preferences and Patient Satisfaction**

It was hypothesized that patients would be most dissatisfied with their appointments when there was a great discrepancy between their preferences and those of their dental student. Table 2 shows correlations between the measures of difference in preferences and measures of patient satisfaction. The pattern that emerges is one of gen-

---

**Table 1. Preference Items for Patients and Dental Students**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Mean for Patients (Students)</th>
<th>Rank for Patients (Students)</th>
<th>Mean Absolute Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>How important is it to you that the dental student:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AFFECTIVE ITEMS (0.62)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Be friendly to the patient</td>
<td>3.94 (4.29)</td>
<td>4 (5)</td>
<td>0.63</td>
</tr>
<tr>
<td>2. Listen to the patient talk about thoughts and feelings</td>
<td>2.81 (4.46)</td>
<td>8 (4)</td>
<td>1.95</td>
</tr>
<tr>
<td>3. Joke around with the patient</td>
<td>2.37 (2.90)</td>
<td>9 (9)</td>
<td>1.07</td>
</tr>
<tr>
<td><strong>COGNITIVE ITEMS (0.38)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Carefully explain the condition of the patient's teeth and gums</td>
<td>4.49 (4.49)</td>
<td>1 (3)</td>
<td>0.68</td>
</tr>
<tr>
<td>5. Explain everything he is doing to the patient</td>
<td>4.03 (3.61)</td>
<td>3 (7)</td>
<td>0.95</td>
</tr>
<tr>
<td>6. Help the patient feel less worried about teeth and gums</td>
<td>3.69 (3.17)</td>
<td>6 (8)</td>
<td>1.29</td>
</tr>
<tr>
<td><strong>BEHAVIORAL ITEMS (0.70)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Show the patient how to use dental floss and a toothbrush properly</td>
<td>3.73 (4.71)</td>
<td>5 (2)</td>
<td>1.15</td>
</tr>
<tr>
<td>8. Discuss the foods the patient has been eating and suggest changes</td>
<td>3.48 (3.80)</td>
<td>7 (6)</td>
<td>1.22</td>
</tr>
<tr>
<td>9. Give the patient careful instructions for what to do to improve his/her teeth and gums</td>
<td>4.42 (4.76)</td>
<td>2 (1)</td>
<td>0.56</td>
</tr>
</tbody>
</table>

*All items on five-point scale, 1 = not at all, 5 = extremely. Higher means and lower ranks indicate greater importance.*

*Numbers in parentheses for each subscale indicate Cronbach's alpha.*
erally strong negative relationships between the two sets of scales. That is, patients who had relatively large differences in preferences between them and their dental students tended to be relatively dissatisfied; conversely, those who generally agreed with their dental students on preferences for the appointment (i.e., had small differences) tended to be satisfied with their appointments. In fact, more than 30% of the variance in overall patient satisfaction was explained by the total difference in patient and student preferences. Differences in cognitive preferences were not related to any of the satisfaction measures, due perhaps in part to the low reliability of the scale. Differences in affective preferences and, even more significantly, differences in behavioral preferences were, however, both related to all of the satisfaction measures.

Patient Satisfaction, Behavior Change, and Improved Dental Health

In order to better understand the process by which differences in preferences, patient satisfaction, and adherence may be related to one another and to improvement in dental health, three sets of regression analyses were conducted. The models tested an hypothesized process whereby satisfaction is related to intentions to improve oral hygiene behavior, intentions to improve are related to actual improvement, and actual improvement in behavior leads to improvement in dental health. In the first regression analyses, intended behavior change was used as the dependent variable, and preference differences, patient satisfaction, and baseline dental health were entered as independent variables. In the second set of analyses, reported behavior change was the dependent variable, and intended change, satisfaction, preference differences, and baseline dental health were included as the independent variables. In the final regression analyses, dental health (GIS) at the second preventive appointment was the dependent variable, and reported behavior change, intended change, satisfaction, preference differences, and baseline dental health were independent variables. Because of high correlations among variables related to each of the three domains (affective, cognitive, and behavioral) for each set of regression analyses, three separate equations were estimated, one including only affective components of satisfaction and preference differences, one including cognitive components only, and one with behavioral components only. Results are shown in Table 3.

In nearly every equation, only the variable hypothesized to be immediately preceding was a significant predictor. That is, only patient satisfaction (specifically, cognitive satisfaction), not preference differences, was a significant predictor of intended behavior change ($B = 0.50, P < 0.001$), and only intended behavior change (and neither satisfaction nor preference differences) was a significant direct predictor of reported behavior change ($B$ ranging from 0.69–0.89 for the three analyses, $P < 0.0001$). Thus, patients who were satisfied with their appointments reported their oral hygiene behavior were all changed during their time one ($B$ ranging from 0.50 to 0.89 for the three analyses, $P < 0.0001$) and ranging from 0.50 to 0.89 for the three analyses, $P < 0.0001$).
TABLE 3. Multiple Regression Analyses

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Affective</th>
<th>Cognitive</th>
<th>Behavioral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>P</td>
<td>B</td>
</tr>
<tr>
<td>Intended behavior change</td>
<td>Baseline GIS</td>
<td>0.21</td>
<td>NS</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Satisfaction</td>
<td>0.15</td>
<td>NS</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Preference difference</td>
<td>-0.01</td>
<td>NS</td>
<td>0.01</td>
</tr>
<tr>
<td>Reported behavior change</td>
<td>Baseline GIS</td>
<td>-0.09</td>
<td>NS</td>
<td>-0.10</td>
</tr>
<tr>
<td></td>
<td>Satisfaction</td>
<td>0.14</td>
<td>NS</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>Preference difference</td>
<td>0.03</td>
<td>NS</td>
<td>-0.18</td>
</tr>
<tr>
<td></td>
<td>Intended behavior change</td>
<td>0.77</td>
<td>&lt;0.001</td>
<td>0.69</td>
</tr>
<tr>
<td>Follow-up GIS</td>
<td>Baseline GIS</td>
<td>0.65</td>
<td>&lt;0.001</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>Satisfaction</td>
<td>-0.22</td>
<td>NS</td>
<td>-0.27</td>
</tr>
<tr>
<td></td>
<td>Preference difference</td>
<td>0.06</td>
<td>NS</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Intended behavior change</td>
<td>0.34</td>
<td>NS</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>Reported behavior change</td>
<td>-0.54</td>
<td>&lt;0.001</td>
<td>-0.53</td>
</tr>
</tbody>
</table>

For each dependent variable, three separate analyses were conducted. One of the following pairs of variables was included in each equation, respectively: affective preference differences and affective satisfaction, cognitive preference differences and cognitive satisfaction, or behavioral preference differences and behavioral satisfaction.

appointments reported intending to change their oral hygiene behavior, and those who said they intended to change their behavior were also more likely to report, 7-10 days later, that they had in fact changed their behavior. And, finally, GIS at time one (B ranging from 0.65-0.71, P < 0.0001) and reported behavior change (B ranging from -0.48--0.54 across the three equations, P < 0.05) were the only significant predictors of GIS at the follow-up appointment. That is, individuals with high scores on the GIS at baseline were more likely to have high scores at follow-up; individuals reporting significant behavior change were likely to have lower (better) GIS scores at follow-up.*

These results make quite clear the importance of specifying several variables along the causal chain from differences in appointment preferences to improvement in objective dental health. Results of multiple regression analyses indicate that each variable in the chain—preference differences, patient satisfaction, intended behavior change, and reported behavior change—had a direct impact on only the next variable, controlling for the previous variables in the sequence. To illustrate the importance of measuring all of these intermediate variables had somewhat higher GIS scores at follow-up controlling for the other variables in the equation. In order to correct for potential multicollinearity problems caused by the high correlation between intended and reported behavior change, additional regression analyses were conducted, in which either intended behavior change or actual behavior change was entered into the equation. Results indicated that only reported behavior change had a significant relationship with follow-up GIS, in both the affective and behavioral equations; neither was significantly related to follow-up GIS in the cognitive equation. Thus, the pattern of the immediately preceding variable as the only significant predictor of the next presumed variable holds.

* The one apparent exception to this pattern was found in one of the equations in which follow-up GIS was the dependent variable. When cognitive components of satisfaction and preference differences were included as independent variables, in addition to reported behavior change and baseline GIS as significant predictors of follow-up GIS, intended behavior change was a significant predictor; individuals who said they intended to change their oral hygiene behav
ables, partial correlations were computed between each variable taken singly and GIS at the follow-up appointment, controlling for GIS at the initial appointment. Significant predictors of improved dental health were difference in behavioral preferences (partial $r = -0.24, P = 0.04$), affective (partial $r = 0.31, P = 0.02$) and cognitive satisfaction (partial $r = 0.35, P = 0.01$), and reported behavior change (partial $r = 0.32, P = 0.02$). Thus, if we had not specified the appropriate intermediate variables and entered the relevant variables simultaneously into equations, we might have concluded incorrectly that several variables had direct effect on improvement in dental health. Instead, effects of preference differences, satisfaction, and intended behavior change are only indirect (as shown in Table 3), with reported behavior change having the only direct effect on improvement in dental health.

**Discussion**

In short, we found that dental patient and practitioner preferences for elements of an appointment differed considerably in some areas. The less the absolute difference between the entire set of preferences of a practitioner and a patient, the more satisfied was the patient. This relationship was very strong and statistically significant. The more satisfied the patient, in turn, the more likely the patient was to report planning to make oral hygiene changes; patients who said they intended to change their oral hygiene behavior in fact reported doing so. Finally, reported behavior change was a significant predictor of change in objective dental health.

This study contributes to our understanding of the provider–patient interaction and its impact on patient behavior and health outcomes in several ways. First, the results make quite clear the importance of provider–patient preference differences as a precursor of satisfaction. Although several previous studies have assessed preference differences, none has assessed preferences *per se* of both practitioners and patients before the appointment and linked the actual difference in the preferences to satisfaction and adherence. Second, a new technique for assessing overall differences in patient and provider preferences is presented and validated. This technique calculates the sum of absolute differences on a series of items about the appointment. Results suggest that, in fact, the extent of differences, not the direction of differences, is important for patient satisfaction and behavior. Third, an objective health outcome indicator is used in this study, validating the self-report of patient adherence. It is more difficult to interpret the results in previous studies where the extent of *ex post facto* reporting biases of the self-report measure is unknown. Fourth, preferences, behavior of the practitioner, patient satisfaction, and adherence behavior are all studied in the same setting so that their joint interrelationships could be assessed.

There are several limitations of the present study. First, the sample size is relatively small. Thus, replications are necessary to indicate the generalizability of the findings. However, lending some additional weight to the findings for the small sample is the lack of differences between the sample of patients and dental students in the study and the original patient and student populations, respectively.

Second, the interaction examined in the study was a prevention-oriented session rather unlike a typical dentist–patient appointment. One would not want to generalize concerning the particular patient–provider differences found here to other sorts of appointments. As these results do confirm some similar results of previous studies, however, it is at least reasonable to think that the general process by which differences in preferences are linked to satisfaction, behavior, and outcome will be similar from one setting to another. This remains an empirical issue to be addressed in future research. Also, as greater emphasis is being
assessed preferences and patients be-
ond linked the actual inferences to satisfaction
a new technique for
ences in patient and presented and vali-
calculates the sum of
a series of items
. Results suggest
differences, not
ences, is important for
behavior. Third, an
e indicator is used in
the self-report of pa-
ter difficult to inter-
ious studies where
reporting biases of
is unknown. Fourth, of the practitioner,
 adherence behavior
ame setting so that
ships could be as-

limitations of the
sample size is rela-
tions are necessary
ability of the find-
g some additional
 or the small sam-
between the sam-
tal students in the
and student
.

in examined in the
oriented session
dentist–patient ap-
ot want to general-
lar patient–pro-
here to other sorts
ese results do cons-
of previous stud-
reasonable to think
 by which differ-
linked to satisfac-
tome will be similar
er. This remains an
essed in future re-
emphasis is being

placed on engaging in preventive health appointments in traditional medical appointments. Generalization to preventive health appointments may be important for research and practice in the decades to come.

Third, it may be difficult to justify generalizing from appointments with neophyte, perhaps apprehensive, dental students to appointments with practicing dentists. Since this is a study of student–patient interaction, rather than full-fledged practitioner–patient interaction, it is important to assess the extent to which the quality of the interactions observed in this study differed from that of interactions that might have been held with senior practitioners. There are several indirect methods available for doing this in the current study. First, one can look at the satisfaction ratings and compare them with ratings given by other samples of patients to their practitioners. For all four satisfaction questions that were also asked by Corah et al. to private practice patients, the responses indicated greater satisfaction with the dental students in this study than the dentists in the other study. Second, for about 50% of the appointments of this study, an objective observer rated the dental students on a variety of dimensions during the interaction. Students generally did what they were expected to in the appointment and were perceived to have generally good rapport with the patients. Third, one can look at the relationship between students’ experience at conducting appointments and patient ratings of the appointments. The lateness of the date during the summer when the appointment was conducted and the number of appointments completed at the time that the student questionnaire was filled out (mean = 2.7) can both be used as proxy variables for experience. I find that neither indicator of experience was related to any of the three satisfaction scales or to improvement in objective dental health by the patient.

Fourth, the impact on adherence and objective outcome was measured over 1 week only. It is possible that this impact was an immediate reaction to an educational intervention, while over the long term, patients’ objective dental health may have regressed to baseline levels. For 10% of the sample, data were available concerning gingival inflammation and plaque scores at a subsequent visit, generally about 6 weeks after the second appointment discussed in this paper. Of four measures available (highest value and total for both gingival inflammation and plaque indices), the means of two were lower (i.e., indicating improvement) at the follow-up appointment than they were at the second appointment, the mean of one remained the same from the second appointment to follow-up, and the mean of the other value had increased slightly but only one fourth of the way toward the baseline value. All four scores were still lower at the follow-up appointment than they had been at baseline, with total plaque score and highest plaque score being significantly lower (P = 0.05 and 0.006, respectively).

Various researchers have found mixed results over the past several decades for the impact of expectations, understanding, patient attitudes, and other patient characteristics on “compliance.” The “difference in practitioner and patient preferences” variable, contributing as significantly as it does in this study to patient satisfaction with dental practitioners and, in turn, to patient behavior, may prove to be an important contributing variable to the complex web of variables linking practitioner–patient interaction and patient behavior.

Acknowledgments

Dr. Curt Ayer, Dr. Don Williams, and the late Betty Brown are gratefully acknowledged for their help in gaining access to and collecting data at the dental clinic. The author acknowledges comments by Howard Leventhal, David Steele, Bonnie Svarstad, Jane Pillavin, and David Mechanic on earlier versions of this paper. The data used in this study were collected as part of a Master’s thesis in Sociology at the University of Wisconsin–Madison, although much of the data presented here were not analyzed in the thesis. An earlier version of this paper was presented at the American Sociological Association meeting, August 1983, in San Francisco, CA.
References


