CASE WESTERN RESERVE UNIVERSITY

GRADUATE STUDIES

We hereby approve the thesis of

JEFFREY SCOTT WEIL, D.D.S.

candidate for the MASTER OF SCIENCE

degree.

Signed: David B Swedlow
(Chairman)

Date June 30, 1978

A COMPARATIVE STUDY OF PSYCHO-SOCIOLOGICAL FACTORS ASSOCIATED WITH ORTHODONTIC TREATMENT

by

JEFFREY SCOTT WEIL, D.D.S.

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School of Dentistry

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Abstract

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The purposes of this investigation were to study the social , and psychological factors which influence parents and/or patients to seek orthodontic treatment. Also, the perceptions of parents, patients, dental students, general dentists, and orthodontists were examined in relationship to their needs, objectives and goals in orthodontics.

The survey instrument for this investigation consisted of six separate collections of information sampled from six populations. Information for instrument development was collected through personal interviews with faculty members of the Case Western Reserve University School of Dentistry, Department of Orthodontics. The interview format called for personal subjective responses from each faculty member regarding their treatment goals and professional reasons for treatment.

The survey was sent to all members of the Cleveland Society of Orthodontics (excepting CWRU faculty members); 107 orthodontist-questionnaires were mailed, and 58 responses were received. Four additional surveys were constructed on the basis of the interviews

with the faculty members and the results of the survey questionnaire previously distributed to orthodontists. The four samples included parents and patients at the CWRU School of Dentistry, and dentists (general practitioners) in the Cleveland, Ohio metropolitan area. The questionnaires were distributed to the parents and patients by the receptionist at the CWRU Orthodontic Clinic. Sixty-three patient and 45 parent questionnaires were completed. The dental student survey was distributed to the second year class, 95 were distributed with 84 returned. Dentist surveys were mailed at random with self-addressed stamped return envelopes. Two hundred were mailed with 116 responses.

Questions were designed to present a sufficient number of alternatives to permit the respondent to express himself thoroughly and accurately. Comments and additional responses were solicited. Due to the abundance of data being collected, the multiple choice format was used throughout. Multiple responses were encouraged on several questions. For questions attempting to rank priorities among several factors, a forced distribution ranking technique was employed. Forced distribution ranking is a sophisticated method of ranking items utilizing an unstructured Q-technique. It offers a rapid alternative to simple rank order and allows for relatively simple analysis of correlations between respondents and/or factors.

As a result of this investigation, the following conclusions were drawn:

1. Patients consider straightness of teeth to be the most important feature of dental appearance and among the most important motivations for orthodontic treatment.

2. Patients and parents consider crooked teeth, bucked teeth, and speech problems, in order, to be of highest priority for seeking treatment.

3. Three-fourths of patients reported having received ridicule with regard to their dental or facial appearance, representing a significant motivational factor in seeking orthodontic treatment. However, only 38% of parents reported an awareness of such ridicule.

4. All respondent groups agreed that a child's self-image will improve with orthodontic treatment.

5. All respondent groups, including orthodontists, strongly agree that orthodontics attempts to do more than merely straighten teeth and that orthodontics can change a child's self-concept.

6. The orthodontists agreed, but to a significantly lesser degree than dental students and dentists, that the demand for orthodontics is based primarily on psychological reasons rather than health factors.

7. All groups strongly agreed that a good dental appearance is socially desirable.

8. While parents felt that personality characteristics can be stereotypically typed on appearance, dental students, dentists and orthodontists disagreed progressively, in order.

9. All groups agreed that an orthodontic patient becomes a better dental patient.

10. All groups agreed that a good-looking smile changes the way people think of a person and that orthodontics may increase the probability of the patient's future success.

11. To the orthodontists, primary treatment objectives were esthetics and function, but there was no consistent discrimination of priority between the two. This was also true for dental students and general dentists.

12. Orthodontists considered improved occlusion and oral health improvement to be of higher priority contrasted with soft tissue improvements and straightness of teeth (consistently ranked). This is dramatically opposed to the responses of the other sampled groups. Thus, the approach to orthodontics by providers may not be consistent with goals of recipients and referring dentists.

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DEDICATION

I wish to dedicate this thesis to my parents...

those who have given so much for me and
have given me so much.
I thank you.

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INTRODUCTION

The orthodontist is trained to perform excellent mechanotherapy but the importance of social psychology as it relates to orthodontic practice has been seemingly overlooked in the training curriculum. There are activating social and psychological factors which motivate the patient and/or parent to seek orthodontic treatment and can affect treatment expectations and results. Yet, seldom does the orthodontist consider the patient's and parents' attitude about malocclusion or their motivation for seeking treatment.

Motivation is a driving force that impels an individual toward activity in response to an incentive or stimulus in his environment. These vital forces that drive an individual to activity manifest themselves in different ways. When an individual responds to a particular driving force or need, a behavior pattern is demonstrated. In our society, driving forces can be diverse in nature, i.e., physical, emotional, psychological, social and cultural.

If a malocclusion or dentofacial aberration has become severe enough to affect the psychological health of the patient, then the disturbance may be considered a "deformity" from this particular point of view. Since the dentofacial complex exhibits and expresses one's psychological manifestations (e.g., emotions, sensuality, intensity, apathy, frustration, etc.), such facial deformities have deep psychological ramifications for the adolescent and his parents.

The orthodontist should be well versed on the sociological and psychological aspects of orthodontic treatment in order to be more fully effective with treatment. In our society, appearance plays a major role in social acceptance. The face often forms the basis for first conscious impressions during social interaction. The typical orthodontic patient is an adolescent for whom body-image or dento-facial disturbances have tremendous impact. This is because these individuals are strongly affected by our society and particularly by persons in their immediate environment.

Social psychology is a complex science. Yet orthodontists perform in various psychosociological situations without a formal background in the field. If motivating factors for treatment were questioned by the orthodontist, the practitioner could certainly benefit at his case presentation from this information. Unfortunately, orthodontists have a tendency to limit the scope of their treatment procedures to examining a patient, taking diagnostic records, and arriving at a proposed diagnosis and treatment. Perhaps the practitioner should consider such questions as:

What motivates the parent-patient to seek treatment?

What are the factors influencing the decision to seek orthodontic treatment, and in what priority are these factors perceived?

Do the parent and patient have accurate perceptions of what orthodontics can and/or will do for them?

Past studies on motivations for orthodontic treatment have considered the attitudes and opinions of parents and/or patients. However, none of these studies was concerned with the attitudes,

beliefs and opinions of patients, parents, general dentists, and orthodontists. Moreover, these investigations neither examined the needs, objectives and goals of treatment as perceived by patients, parents,general dentists, and orthodontists, nor compared such perceptions among these groups.

The primary objectives of the present study are thus to:

1. collect data from parents, patients, intermediaries, dentists and orthodontists concerning their perceptions of orthodontic treatment, and

2. interrelate psychosocial dimensions among these groups.

It is the hypothesis of this study that parents seek orthodontics for their children primarily in order to provide them with a more esthetic appearance (specifically, "straight teeth") in the hope that it will enable their siblings to enjoy higher achievements and success in our society. Yet, orthodontists are striving to do much more than merely straighten teeth, and many may even consider well-aligned teeth a by-product of treatment, not a primary goal. There appears to be some discrepancy between providers and recipients of treatment. Therefore, this study will attempt to compare perceptions of patients, parents, dental students, general dentists and orthodontists, in order to identify and characterize failure in communication attributable to lack of information or misunderstanding.

REVIEW OF THE LITERATURE

> Go where we will, wander down the village street or the crowded avenues of great cities or wherever humanity congregates, and we will be confronted by these (occlusal) deformities in such number that we are amazed at their prevalence. . . (E. H. Angle on the importance of the epidemiologic aspect of malocclusion, 1907).

Many observers have noted that the demand for correction of malocclusion is often based on psychological or sociopsychological factors rather than urgent reasons of health and function (Secord and Backman, 1959; Jenny, 1975; Prahl-Anderson, 1978). While malocclusions are essentially physical abnormalities, their impact upon the patient may also be strongly psychological. The psychological effects of malocclusions need to be classified, counted, measured and weighed (Fisk, 1963). Nevertheless, research to date has not yet fully identified the relevant underlying personal and social factors.

Orthodontic treatment is rendered to produce improvements in function and appearance (Ouellette, 1975). Whether significant functional benefits are effected remains unresolved at the present time, suggesting that the main benefit of treatment lies in esthetic changes alone (Alexander and Tipius, 1970; Jacobsen, 1973). It has yet to be shown that individuals with ideal occlusion have significantly less caries and periodontal disease or function significantly better than individuals with malocclusions (Prahl-Anderson, 1978).

Ouellette (1975) noted that of 93% of adult patients who had undergone facial changes through orthodontic treatment or facial surgery, 93% felt their lives had been enhanced considerably. Of the 93%, 75% said they were now more self-confident, were able to make friends easier, and took more pride in themselves and their appearance. Also, 35% said they felt they now did a better job or earned more money because of their improved appearance. Fifty-eight percent of these patients had been aware that something was wrong with their teeth or the way they looked before they consulted with a physician or dentist. Forty-five percent decided to have treatment because they were unhappy about their appearance, while thirty-six percent decided to have treatment primarily because of medical reasons.

In addition to social effects of malocclusion there exists many psychological effects. Behavioral compensating mechanisms can be viewed as adjustment to the existence of some dentofacial deformity. Examples of such compensating mechanisms include attitudes of protective hostility, and information control (i.e., hearing only what one wants to hear). One might consider the degree of psychic distress caused by a congenital disfigurement to be directly proportional to its severity, but this has proved not to be the case (MacGregor, 1970). Prahl-Anderson (1978) found that patients with deformities which were sources of amusement to others, had more behavioral disorders and were more maladjusted than patients with the deformities that were distressing to look at or tended to elicit pity. Patients with dentofacial deformities fall into a category of

uncertainty when confronting another person, since reactions include being ridiculed, discussed, ignored or unnoticed. The lack of predictability in any situation makes for difficulty in adjustment. The social and psychological significance of dentofacial deformities and their role in interpersonal adjustments has not been studied thoroughly, although it is recognized that the dentofacial complex is important in communication and interaction with other people (Prahl-Anderson, 1978). Secord and Backman (1959) suggest three sources of impression formulation--cultural determinants, inference processes, and perceiver attributes. Where malocclusions exist, impressions most typically involve the degree to which one's personal relationships are distorted because other people have responded to the defect with lack of acceptance, ranging from horror (probably rare) to mild amusement. Needless to say, a similar reaction of others can be interpreted or responded to differently, by persons with differing levels of adjustment, self-concept or concern about the defect. A person's own individual reaction to malocclusion and physical or interpersonal impairment is rarely evaluated realistically due to personality considerations.

Dental professionals have little knowledge about how people regard their own dental appearance or that of others (Secord and Backman, 1959). However, it is apparent that many people may not enjoy complete social and mental well-being if their mouths are esthetically displeasing (Goldstein, 1969). Most researchers agree that good dental appearance is socially desirable (Linn, 1966;

Samuels and Prashek, 1973).

Secord and Backman (1959) attempted to show that there is consistency in stereotypic evaluation of the personality of an individual based on dentofacial characteristics. This study was actually related to judgments of physical attractiveness. They showed that good tooth alignment was directly related to a person's sincerity, intelligence and conscientiousness, and indirectly related to characteristics such as talkativeness and dominance. Crooked teeth were found to be directly associated with warmheartedness, but related inconsistently to a lack of intelligence. It appears that personality characteristics are indeed evaluated on the basis of one's dentofacial appearance.

Secord and Backman (1959) found a positive but small relationship between the degree of malocclusion and esthetic appearance. Linn (1966) found that a large majority of adults, regardless of social background, identified dental appearance as important, particularly in interpersonal situations. It is interesting to note that more than one-third of those interviewed had uncorrected and highly visible dental defects, but less than one-fourth of these individuals seemed self-conscious about their defect. A social class influence was present in that lower income persons were less likely to have dental defects corrected.

Baldwin and Barnes (1965) found that nearly half of a large sample of candidates for orthodontic treatment reported never being teased about their malocclusion, while only 10% reported teasing as

a frequent occurrence. They concluded that teasing is not an important motive for seeking orthodontic treatment. Lewit and Viroloinen (1968) showed that a majority of adolescents see their peers as accepting the need for orthodontic treatment; about one-third anticipated ridicule as a response to orthodontic treatment (although the occurrence or severity of such responses remains to be documented). It seems, therefore, that the primary impact of the malocclusion is not in the response of others to facial irregularity but in the self-response of the individual.

There are research findings which suggest that children may consider facial disfigurement more relevant to social relationships than other physical handicaps (Richardson et al., 1961; Matthews and Westie, 1966; Chigier and Chigier, 1968). Richardson and coworkers found that children and adults displayed a culturally uniform tendency to view facial disfigurement and obesity with more disfavor than an amputated hand, a leg in a brace, or the need for a wheel-chair. Only Italian and Jewish sub-groups placed facial disfigurement less disfavorably than these other three physically disabling conditions. In Israel, where there exists more cultural heterogeneity than in the U.S., children of low socio-economic status tended to rank cosmetic disability (obesity and facial palsy) less disfavorably than some other physical disabilities; the reverse was the case with the children of higher socio-economic backgrounds. Thus, the higher the socio-economic status, the more unfavorable the attitude towards facial disability.

Baldwin et al. (1967) looked at motivational factors in orthodontic treatment. They first excluded a number of "evident" motivational factors as being of obvious primary importance, since more than one-half of their group showed at most a mild degree of dental disfigurement. This is consistent with Howitt et al. (1963), who showed that a large group of children with esthetic dentitions expressed dissatisfaction with their dental appearance. Only a small percentage of the children involved in the study by Baldwin et al. (1967) reported teasing by their peers because of their appearance. With objective disfigurement and social pressures minimized, these authors focused on the role of the mother as the family member initiating orthodontic treatment. In a follow-up study, Baldwin et al. (1969) found that "reality" factors, such as dentofacial deformities, accounted for the primary motive in fewer than 5% of the families. Such motives as the resolution of parental or family problems through child treatment predominated, with status-seeking also present in a substantial proportion of the families. Again, when these children were asked why they were coming for treatment, more than one-half cited their mother's influence, and more than two-thirds indicated an influence by either one or both parents. Baldwin et al. (1966) concluded that it is the parents, rather than the child, who are usually first motivated toward orthodontic treatment for the child. Therefore, in order to isolate motivational factors, both the child's and parent's perceptions of and reactions to the child's malocclusion must be considered (Baldwin

and Barnes, 1966).

In a further study, Baldwin et al. (1967) found that an esthetic dentition was seen by all parents as more desirable for girls than for boys regardless of the sex of their own children. Children tended to view orthodontic treatment as desirable for immediate benefits, while parents were more concerned with long term goals. Hilzenrath and Baldwin (1970) found that students with malocclusion who have not received orthodontic treatment have lower achievement motivation than treated students, again reinforcing the role of status-seeking as a motive. Lewit and Virolainen (1968) found that children with severe malocclusion have the greatest desire for orthodontic treatment, but there was no difference in desire between the moderate malocclusion and good occlusion groups.

Maj et al. (1962) studied a large group of young orthodontic patients and concluded that they all viewed their treatment as a stressful experience. Kreit et al. (1968) have attempted to develop a personality inventory to identify the cooperative orthodontic patient. They reported that the most salient feature of uncooperative patients is a poor relationship with their parents. These findings are consistent with Baldwin et al. (1967) identification of parental motivation as the primary basis for treatment, with the child seen as acting out his relationship with the parents through the orthodontic situation.

Prahl-Anderson (1978) assessed the need for orthodontic treatment in medical terms by judging the occlusal condition as based

on three criteria: (1) objective signs, (2) subjective symptoms, and (3) social sufficiency. Of these three, subjective symptoms are critical because there must be recognition by the individual that his deviation has created a problem. Secord and Backman (1959) assess this "interpersonal adjustment" of the individual as follows:

1. the effect of the patient's malocclusion on the perception of the patient by other persons, and
2. the patient's reactions toward his malocclusion and toward the way others behave toward him.

There seems to be little question that physical characteristics are important determinants of the behavior a person elicits from others in face-to-face interactions. Goffman (1963) suggested that anatomical characteristics which have a negative valuation (e.g., some noticeable physical stigma) may be "behavior elicitors" in interpersonal encounters. The physically stigmatized person is in a distinctly disadvantageous position affected by the behavioral outcomes which he/she typically experiences from others (Kelley et al., 1960; Kleck, 1968). Likewise, the desire for cosmetic surgery appears to have its roots in social and cultural pressures to conform to more desirable standards within the culture (MacGregor, 1967). Approximately half of her patients were seeking improved cosmetics and wished to avoid undesirable personality characteristics ascribed to stereotyped facial features. That cognizance of physical appearance is so critical was further exemplified in a study done by Walster et al. (1966), showing the importance of physical attractiveness in dating behavior. These authors indicated

that the greatest determinant in the nature of partner interactions was physical attractiveness, specifically in determining dating styles and pattern. Among college students, it was found that physical appearance was the only variable to be consistently related to popularity--attractive men prefer attractive women (Prahl-Anderson, 1978).

Lewit and Virolainen (1968) correlated self-perceived orthodontic conditions with objective orthodontic condition and found only a moderate relationship ($r = .43$). Howitt et al. (1967) attempted to correlate objective orthodontic condition with satisfaction with one's teeth, but found the relationship to be considerably less pronounced ($r = .25$). Cohen and Horowitz (1968), asked children to order preferences for occlusal conditions and found that factors identified when evaluating their own condition ranked high on the list of general occlusal preferences. Howitt et al. (1967) found that dissatisfaction with one's teeth was strong for subjects with poorer than average oral esthetics, but approximately one-third of the subjects who indicated dissatisfaction with their teeth had reasonably esthetic dentitions.

The following citations express the need for standards understandable by lay persons with regard to the nature of different malocclusions:

> The discipline of orthodontics faces a serious problem today. It is imperative that we establish workable standards to define "malocclusion" not only to satisfaction of our professional colleagues but in a meaningful way for the public as well (Fisk, 1963).

> Such an index should not only establish a priority of treatment for an individual according to the severity of the malocclusion and the functional disability but also measure and evaluate the degree of esthetic handicap associated with malocclusion (Prahl-Anderson, 1978).

The quantitative estimation of the overall severity of malocclusion requires a small number of accurate predictors. It is imperative that variables which do not influence the clinician's assessment be eliminated, and that the number of highly intercorrelated variables be reduced. Severity of malocclusion is generally accepted to be a continuous variable ranging from almost ideal occlusion to very severe, even though only a limited number of points along the continuum are identified and utilized. The abstract nature of an overall severity assessment is almost certainly a source of high intra- and inter-examiner variations. This variability has been shown to be very high (Freer et al., 1973). For example, inter-examiner variation of severity assessments is related to the severity of the malocclusion assessed. As the severity of the malocclusion increases, the magnitude of the differences among examiners decreases.

> At this point, some mention should be made of the implication that the presence of malocclusion can be measured objectively. Biometric norms can be collected or ideals can be postulated, and deviations from these norms or ideals can be noted, but the point at which any deviation is of sufficient magnitude to be considered a malocclusion remains a subjective decision with social and psychological roots. Thus, one person might tolerate a rather large deviation while another will be quite disturbed by a minor deviation (Stricker, 1970).

The discrepancy between lay and professional judgments has been alluded to by Secord and Backman (1959), Lewit and Virolainen (1968), and Howitt et al. (1967), among others, but this was most dramatically expressed by Goldstein (1969). On the basis of clinical exams and facial photographs, he concludes that 97% of his subjects could have benefitted from some treatment for esthetics and that 90% needed this treatment for esthetics. Although most of his subjects agreed that it was possible that their dental appearance could be improved, only 28% felt that their teeth actually detracted from their appearance. All the subjects were finalists in the Miss Atlanta Pagent, making the social evaluation of their appearance perfectly clear. The line between deviation from a dental ideal and the presence of dental pathosis can only be established subjectively, and in orthodontic conditions where function is not impaired, the self-perception of the patient may be more relevant than the professional judgment of a dentist.

Finally, we must consider a malocclusion from the social, psychological and cultural viewpoint and attempt to define it. Young and Zwemer (1966) define malocclusion as a community problem in contrast to one that is solely a problem of the individual. It is a problem that must first present itself as a biological occurrence representing some form of deviation from the accepted norm; then there must be a recognition by the individual and later by the community that there exists a problem due to this deviation, either self-assessed or identified by a dentist. Either the dentist or the

patient has to evaluate the norm and those conditions which constitute significant deviations from this norm. Obviously, malocclusions have been defined in terms of myriads of anatomic, functional, esthetic and biometric criteria, but all these definitions are directed to the dental profession. There seems no doubt that a public health definition of malocclusion must include considerations of psychological, social and cultural handicaps to an individual. The degree to which physical characteristics are important determinants of a person's behavior in relation to others seems to be related to the degree of negative valuation called stigma (Goffman, 1963). Goffman argues that a physical deviation is typically discrediting to the individual, and others who associate with the stigmatized person will also be discredited. Other investigators have confirmed these notations (Kleck, 1968; Secord and Backman, 1958). A particular occlusal condition may become a handicap not because it is physically limiting (e.g., chewing and/or talking), but because of its adverse social relationships (e.g., in dating, getting a job and seeking public office, Linn, 1966). It is also possible that a given malocclusion may not be seen as a handicap to the individual himself (Sergl, 1967).

Severity of malocclusion is a subject which has been discussed for years in efforts to subjectively standardize and rank malocclusion into esthetic categories. Unfortunately, to date success has been limited. The Eastman Esthetic Index (Howitt et al., 1967) is an attempt to measure the handicap of a patient in a way

that is comprehensible to both dentist and patient. This index combines objective clinical measurements and subjective data from multiple choice questionnaires. Results suggest that there exists a sizeable group of children who are dissatisfied with their teeth but who would not benefit from orthodontic treatment. The Supplementary Handicapping Malocclusion Assessment Record provides an alternative method for determining treatment desirability from the points of view of the examiner, the patient, the parents and the teacher (Salzmann, 1968). The three criteria used are esthetic deficiency, interference with function and dental health. Jameson and McMillan (1966) also suggest an index of malocclusion for use in multiphasic screening and epidemiologic investigations. They include a weighting factor to account for "psychological disturbance."

While the definition of a malocclusion can involve psychological, sociological and cultural factors, it becomes imperative that third party agencies, such as government and insurance programs interpret, define and comprehend malocclusion in reliable and valid terms for both the provider of service and the consumer.

The most direct attempt to evaluate the response of others to dentofacial characteristics was done by Secord and Backman (1959). Of the dentally relevant variables, "whiteness of teeth" was most important, yet it ranked 16th of 34 whole-body variables. Characteristics of the chin (protruding, receding, round, square) were next in order. Malocclusion-related characteristics, such as "protrusion of upper teeth" and "straightness of teeth" were ranked 28th and

33rd, respectively. This suggests that at least some dentofacial characteristics may not be as critical as some other categories of physical impairment in one's perception of another.

Pope (1953) reported that in children physical appearance was most clearly related to popularity among 21 psychological variables. Walster et al. (1966), working with college students, found that physical appearance was the only variable to be consistently related to popularity following short acquaintances. Frazier and Lisonbee (1950) studied factors regarding the physique of tenth-grade boys and girls. Only 20% recognized any irregularity of their own teeth, and only 40% of these individuals showed any concern. When asked whether they would like to change their physical appearance, they ranked teeth 8th of 11 categories, with only 3% of the desired changes involving the dentition.

Teenagers who have had orthodontic treatment might be expected to differ in cooperation from untreated teenagers since treatment requires regular home care of the teeth and frequent visits to the dentist. According to Linn (1974), orthodontic treatment was not associated with selection of the most important of 6 reasons for taking care of teeth and gingiva. The unsatisfied need for orthodontic treatment was not associated with concern about crooked teeth. Teenagers who expected eventually to have treatment were more likely than others to select crooked teeth as the most concernable of 5 oral problems listed (41%). Ranking next were teenagers who said they needed treatment but did not expect to receive it (30%).

Ranking last were teenagers who claimed they did not need treatment (7%). Those with completed treatment were the most likely of all to be satisfied with the general appearance of their teeth (88%). The least satisfied were those who felt that they were in need of, but did not receive, treatment. Orthodontic treatment was associated with those teenagers reporting good oral health care. Eighty-three of those under treatment or who completed treatment compared to 69% of the others.

An attempt to estimate the demand for orthodontic treatment in Sweden was made by Lindegard et al. (1971). These authors compiled the judgments of parents of school age children as to the demand for orthodontic treatment, from pre-treatment records of selected cases treated by orthodontists. This study, however, gives only an incomplete picture because the individual with the malocclusion was not questioned. In a further study done in Sweden, the desire for treatment was shown to be considerably lower than the objectively demonstrated need for treatment as determined by orthodontists Myrberg and Thilander (1973). These investigators reported that about one-fifth of school children with diagnosed anomalies declined orthodontic treatment.

An individual's evaluation of, and satisfaction with, the esthetic component of his occlusion is influenced to some degree by the realistic awareness of the condition of his mouth. This degree is somewhat limited, and there remains a substantial amount of variance in dental attitudes which apparently is unrelated to dental

conditions. These factors remain to be clarified. In the Nymegen Growth Study (Prahl-Anderson, 1973), it was hypothesized that the severity of malocclusion is judged by the orthodontist on functional, morphological and esthetic criteria, whereas, parents' opinions of severity of their children's dental condition probably are based on different criteria.

> The results of the literature and studies reported show that the orthodontist, the patient, the significant others, and society at large probably define and interpret malocclusions and craniofacial malformations quite differently. To determine the indication for treatment, to make the decision that this patient needs treatment, factors such as social sufficiency of the patient should be considered. . .Cosmetic work should not, while functional problems go untreated, be done because the paying patient gets the service. Yet, it should be realized that a malocclusion may become handicapping not because of functional disability, but because it may adversely affect social relationships (Prahl-Anderson, 1978).

METHODS AND MATERIALS

The survey instrument for this investigation consisted of six separate collections of information sampled from six populations. Information for instrument development was collected through personal interviews with faculty members of the Case Western Reserve University School of Dentistry, Department of Orthodontics. The interview format called for personal subjective responses from each faculty member regarding their treatment goals and professional reasons for treatment. There was no discussion; all comments were recorded. A pilot test was then performed utilizing this questionnaire with responses provided by the nine orthodontic graduate students at CWRU. Pilot results effected no modifications in the survey. The survey was sent to all members of the Cleveland Society of Orthodontics (excepting CWRU faculty members); 107 orthodontist-questionnaires were mailed, and 58 responses were received.

Four additional surveys were constructed on the basis of the interviews with the faculty members and the results of the survey questionnaire previously distributed to orthodontists. The four samples included parents and patients at the CWRU School of Dentistry, and dentists (general practitioners) in the Cleveland, Ohio metropolitan area. Each survey contained questions considered significant for one or more of the following reasons:

1. previous research indicated value or controversy about the information;
2. parallel questions could be asked on two or more surveys to compare sub-population responses;
3. demographic data would be solicited to compare sub-populations;
4. specific questions could be asked to identify individual group characteristics.

These four questionnaires were pilot-tested on 3-5 members of each population. Modifications were subsequently made to clarify language; there were no changes in methodology.

The questionnaires were distributed to the parents and patients by the receptionist at the CWRU Orthodontic Clinic. Her instructions were to distribute these surveys in pairs to one or both parents and to one or more patients of the same family as they arrived. Any other children in this family were encouraged to complete the survey. Sixty-three patient and 45 parent questionnaires were completed. The dental student survey was distributed to the second year class, 95 were distributed with 84 returned. The dentist surveys were distributed randomly, utilizing a list of all dentists in the Cleveland area and a table of random numbers. The dentist surveys were mailed with self-addressed stamped return envelopes. Two hundred were mailed with 116 responses.

Questions were designed to present a sufficient number of alternatives to permit the respondent to express himself thoroughly and accurately. Comments and additional responses were solicited. Due to the abundance of data being collected, the multiple choice format was used throughout. Multiple responses were encouraged on

several questions.

In general, whenever one attempts to extract information from people, possibilities for inadvertent personal sponsorship, bias, loading, and uni-directional approach on the part of the investigator are inevitable. Considering the sample size and the diversity of the individuals surveyed, even if the questions could be asked in a totally unbiased manner, there is no control over the nature of the responses.

For questions attempting to rank priorities among several factors, a forced distribution ranking technique was employed. Forced distribution ranking is a sophisticated method of ranking items utilizing an unstructured Q-technique. It offers a quick and easy to do alternative to simple rank order and allows for relatively simple analysis of correlations between respondents and/or factors.

All the individual questions were summarized and tabulated as to raw score responses (See Appendices 1-5). Frequency and means of response were the mode of comparison of data.

TABLE I

DEMOGRAPHIC SAMPLE CHARACTERIZATION

(PATIENTS)

Sex

Male	Female
52%	48%

Age

11-13 yrs.	13-15 yrs.	over 15 yrs.
9%	59%	32%

Siblings

Oldest	Middle	Youngest	Only
27%	36%	32%	5%

TABLE II

BIPOLAR RESPONSES

(PATIENTS)

Question	Yes	No
#4 Thinks he/she needs braces	90%	10%
#7 Wearing braces makes better dental patient	87%	13%
#10 Improved smile changes others opinion of you	67%	33%
#13 Orthodontics does more than straighten teeth	81%	19%
#14 Comments from friends about your teeth	75%	25%
#15 Improved smile and future success	76%	24%
#17 Orthodontics being painful	52%	48%

TABLE III

MULTIPOLAR RESPONSES

(PATIENTS)

Question	Response
#5 Who first suggested orthodontics?	
Mother	25%
Father	22%
Myself	9%
D.D.S.	33%
Friend	4%
Other	6%
#11 Source of opinions about orthodontics	
Television, newspapers	1%
Friends, relatives, teacher	28%
Personal observation	49%
D.D.S.	8%
Orthodontist	13%
#8 Occurrence of problems	
1. Biting apples	14%
2. Cleaning teeth	13%
3. Chipping, cracking front teeth	6%
4. Not smiling, embarrassed	13%
5. None of the above	54%
#9 Need of treatment	
a. For appearance	37%
b. Dental health	44%
c. Because my friends are	2%
d. My parents desire it	13%
e. Other	3%
#6 Corrections of treatment	
a. Straighten teeth	22%
b. Correct bite	21%
c. Improve overbite	20%
d. Change appearance	22%
e. Healthier mouth	10%
f. Other	5%

TABLE IV A

FORCED DISTRIBUTION RANKINGS #12

(PATIENTS)

#12 Who do you think needs braces?

A. Someone who has "crooked" teeth
B. Someone who has "bucked" teeth
C. Someone who cannot bite apples or other types of food
D. Someone whose jaws are too big
E. Someone whose jaws are too small
F. Someone who has too many teeth
G. Someone who has too few teeth
H. Someone who has one jaw which is too big and one jaw which is too small
I. Someone who has an overbite
J. Someone who has a speech problem
K. Someone who has a breathing problem
L. Someone who has a bad bite
M. Someone who has an unhealthy mouth
N. Someone who has an unsightly smile
O. Someone who has a poor facial profile

Most		Least	
A	19%	A, J, M	2%
B	17%	H	3%
K	11%	B	4%
J	9%	F, I	5%
M, C, H	6%	G, L	7%
F	5%	C	8%
E, I	4%	N	9%
L, N, O	3%	O	10%
G, D	2%	D, E	11%
		K	12%

TABLE IV B

SCALE OF MEAN RANKS #12

(PATIENTS)

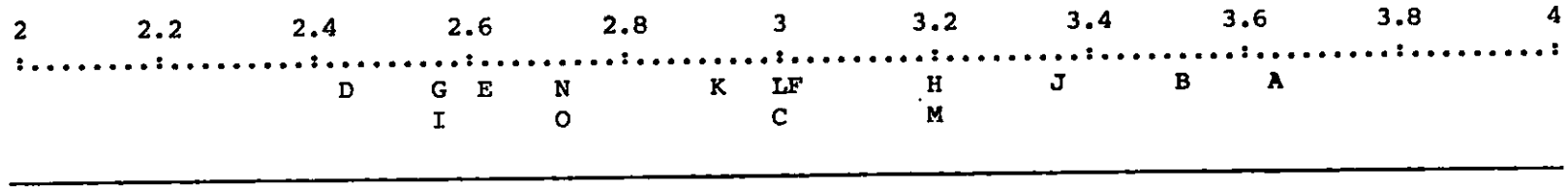


TABLE V A

FORCED DISTRIBUTION RANKINGS #16

(PATIENTS)

#16 Which features are most/least important in terms of dental and total appearance?

A. Whiteness of teeth
B. Straightness of teeth
C. Fullness of lips
D. Curvature of mouth
E. Large chin or little chin
F. Location of upper teeth
G. Many teeth showing in a smile
H. Straight facial profile
I. Showing some gums in a smile

Most		Least	
B	44%	B - H	2%
A	16%	D	3%
D - F	10%	A - F - G	6%
E - I	7%	E	13%
G - H	3%	C - I	31%
C	0		

TABLE V B

SCALE OF MEAN RANKS #16

(PATIENTS)

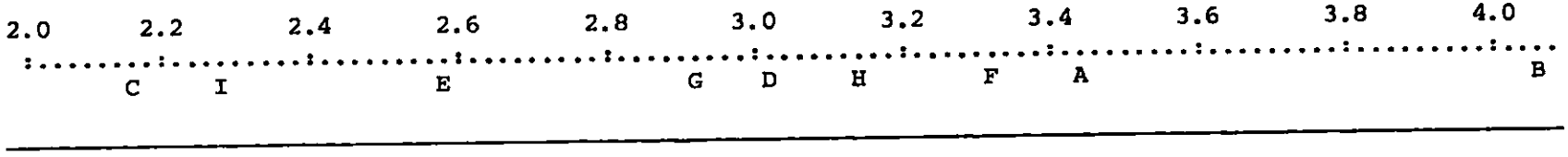


TABLE VI A

DEMOGRAPHIC SAMPLE CHARACTERIZATION

(PARENTS)

Respondent

Mother	Father
76%	24%

Marital Status

Married	Divorced
96%	4%

Age

Under 30	31-40	Over 40
4%	38%	58%

Number of Children in Family

1	2	3 or More
2%	16%	82%

TABLE VI B

DEMOGRAPHIC SAMPLE CHARACTERIZATION

(PARENTS)

Question	Response
#5 Child requiring orthodontic treatment:	
The oldest	31%
A middle child	36%
The youngest	31%
An only child	2%
#6 Previous experience with orthodontics:	
Parent was treated	9%
Another child was treated	36%
Parent and another child was treated	7%
Parents brothers or sisters were treated	0%
None, first experience	48%
#7 Parents educational level:	
Did not finish high school	6%
High school graduate	44%
Technical/training school	10%
Some college	25%
College graduate	15%
#8 Family income (annual):	
Under $10,000	2%
$10,000-$14,999	29%
$15,000-$19,999	31%
$20,000-$24,999	24%
Over $25,000	13%

TABLE VII

MULTIPOLAR RESPONSES

(PARENTS)

Question	Response
#9 Opinions about orthodontics comes from	
TV, newspapers, etc.	2%
Friends, relatives	19%
Personal observation	41%
Your general dentist	19%
Your orthodontist	20%
#10 Why did you seek orthodontic treatment for your child?	
I was aware of a problem	57%
Our child was aware of a problem	7%
Our dentist referred us	34%
Our physician referred us	2%
Other	0%
#11 Why does your child need orthodontics?	
"Crooked" teeth	22%
Too many teeth	14%
Overbite	13%
Unsightly smile	11%
"Bucked" teeth	10%
Jaws are too small	10%
Poor facial profile	8%
Malocclusion (bad bite)	6%
One jaw too big, other too small	2%
Can't bite apples; speech problems; breathing problems; unhealthy mouth; other	1%
Jaws are too big	0%
#13 Why do you think that orthodontic treatment is necessary?	
Esthetic cosmetic reasons	0%
Oral health (dental) reasons	7%
Both of the above	93%

TABLE VII continued

Question	Response
#15 What happens in orthodontic treatment?	
Guidance of growth	18%
Expansion of jaws	7%
Extraction of teeth	29%
Straightening of teeth	46%
#16 How long do you expect treatment to last?	
6 months or less	0%
6 months-1 year	0%
1 year-2 years	62%
more than 2 years	38%
#21 If you had twins (one boy and one girl) and could only afford one treatment, which one would you choose?	
The boy	9%
The girl	58%
I'd treat neither	33%

TABLE VIII

BIPOLAR RESPONSES

(PARENTS)

Question	Yes	No	Maybe
#12 Is orthodontics painful?	67%	33%	
#14 Does your child mind braces?	13%	84%	2%
#17 Does a good looking smile change peoples thoughts about a child?	78%	22%	
#19 Are bad bite and crooked teeth inherited?	56%	22%	22%
#18 Do people make your child aware of his dentofacial appearance?	38%	62%	
#20 Orthodontics + future success	79%	21%	
#22 Straight teeth and appearance of sincerity, intelligence and conscientiousness	71%	29%	
#23 Poor self-image due to malocclusion?	82%	18%	
#24 Will self-image improve with treatment?	93%	7%	
#25 Is a good dental appearance socially desirable?	100%	0%	
#26 Braces for child with one crooked tooth	45%	55%	
#27 Orthodontic patient becomes a better dental patient	98%	2%	
#29 Does orthodontics attempt to do more than straighten teeth?	91%	9%	

TABLE IX A

FORCED DISTRIBUTION RANKINGS #28

(PARENTS)

#28 Which features are most/least important in terms of dental and total facial appearance?

A. Protruding or receding chin
B. Small or large bones
C. Square or round face
D. Mouth curvature
E. Width of nose
F. Whiteness of teeth
G. Facial tension
H. Fullness of lips
I. Round or square chin
J. Size of mouth
K. Compressed or relaxed lips
L. Length of nose
M. Prominence of cheekbones
N. Protrusion of upper teeth
O. Bow-shaped or straight lips
P. Straightness of teeth

Most		Least	
P	41%	P, G	- 0%
N	19%	D, F, H, I, J, O	- 3%
A	14%	E, K, N	- 6%
F	11%	A, L, M	- 9%
D, M	- 5%	B	12%
C, J	- 3%	C	26%
B, E, G, H, I, K, L, O	- 0%		

TABLE IX B

SCALE OF MEAN RANKS #28

(PARENTS)

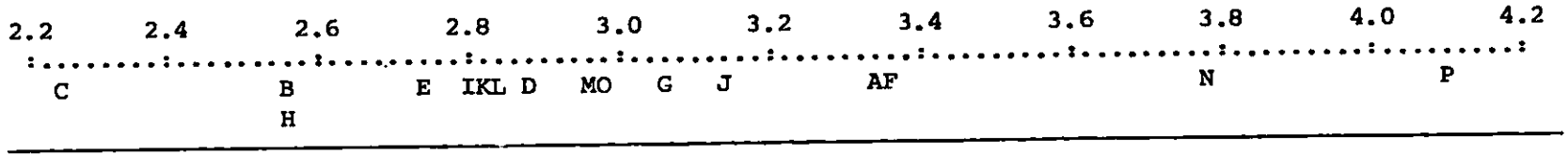


TABLE X

MULTIPOLAR RESPONSES

(DENTAL STUDENTS)

Question	Response	
	Yes	No
#1 Have you had orthodontics?	45%	55%
#2 Your opinions about orthodontics come from:		
TV, newspaper, etc.	3%	
Friends and relatives	19%	
Personal observation	23%	
Your general dentist	6%	
Your orthodontist	7%	
Dental school to date	41%	
#3 Why is orthodontic treatment necessary?		
Esthetic (cosmetic) reasons	68%	
Oral health (dental) reasons	30%	
Other	2%	
#4 What happens in orthodontic treatment?		
Guidance of growth	30%	
Expansion of jaws	8%	
Extraction of teeth	14%	
Straightening of teeth	32%	
None of the above	1%	
Other	14%	
#19 Extraction of permanent teeth for orthodontic purposes:		
opposed	2%	
question the need	14%	
realize the necessity	83%	

TABLE X continued

Question	Response
#18 Consider the side effects of orthodontics (root resorption, decalcification, caries, etc.):	
minimal in relation to benefit	39%
significant	31%
accept objectively	30%
#21 Consider relapse following orthodontic treatment, when would you evaluate a treated case?	
at debanding	5%
2 months into retention	21%
6 months into retention	21%
1 year into retention	9%
1 year after retention	45%

TABLE XI

BIPOLAR RESPONSES

(DENTAL STUDENTS)

Question	Yes	No	Don't Know
#5 Does orthodontics attempt to do more than straighten teeth?	87%	13%	
#6 Do you recognize orthodontic problems?	67%	33%	
#7 35 yr. old Cl. II Div. 1-treatment?	19%	64%	17%
#8 12 yr. old Cl. II Div. 1	58%	18%	24%
#9 Do you consider functional problems such as speech, breathing and mastication indications for orthodontic treatment?	98%	2%	
#10 Can orthodontics change a child's self-concept?	100%	0%	
#11 Demand for orthodontics based on psychological reasons rather than health factors	92%	8%	
#13 Good dental appearance socially desireable	95%	5%	
#14 Personality characteristics stereotyped on appearance?	48%	52%	
#15 Are straight, well-aligned teeth overly esthetic or false-looking?	8%	92%	
#16 Orthodontic patient becomes better dental patient?	70%	30%	
#17 Orthodontics and increased probability for future success?	62%	38%	
#20 Is a malocclusion stable?	52%	24%	24%
#23 Does growth influence orthodontic treatment?	96%	4%	
#24 Does a good looking smile change the way people think of a person?	89%	11%	

TABLE XII

RANK ORDER

(DENTAL STUDENTS)

Question	Most	Mid	Least
#12 Rank the following benefits of orthodontic treatment:			
esthetics	44%	31%	25%
function	43%	48%	10%
stability	13%	20%	65%
#22 Rank treatment goals according to importance:			
optimal proximal and occlusal contacts	21%	31%	48%
dentofacial esthetics	30%	40%	29%
oral health and stability	49%	29%	22%

TABLE XIII

MULTIPOLAR RESPONSES

(DENTISTS)

Question	Response
#1 How long have you been practicing?	
under 5 years	26%
6-10 years	12%
11-20 years	21%
over 20 years	41%
#2 Do you do any orthodontic treatment?	
frequently	8%
seldom	34%
almost never	59%
#3 What percentage of your patients receive necessary orthodontic treatment?	
90% or more	2%
60-89%	16%
40-59%	16%
10-39%	27%
less than 10%	34%
#4 What percentage of your patients inquire about necessary orthodontic care?	
90% or more	29%
60-89%	16%
40-59%	10%
10-39%	19%
less than 10%	26%
#19 Extraction of permanent teeth for orthodontic purposes?	
opposed	3%
question the need	6%
realize the necessity	91%

TABLE XIII continued

Question	Response
#18 Consider the side effects of orthodontics (root resorption, decalcification, caries, etc.):	
minimal in relation to benefit	45%
significant	22%
accept objectively	33%
#21 Consider relapse following orthodontic treatment, when would you evaluate a treated case?	
at debanding	5%
2 months into retention	6%
6 months into retention	15%
1 year into retention	11%
1 year after retention	63%

TABLE XIV

BIPOLAR RESPONSES

(DENTISTS)

Question	Yes	No	Don't Know
#5 Does orthodontics attempt to do more than straighten teeth?	82%	18%	
#6 Do you recognize orthodontic problems?	98%	2%	
#7 35 y.o., Class II Division 1, treatment?	12%	76%	12%
#8 12 year old, Class II Division 1, treatment?	60%	12%	28%
#9 Do you consider functional problems such as speech, breathing and mastication indications for orthodontic treatment?	96%	4%	
#10 Can orthodontics change a child's self-concept?	99%	1%	
#11 Demand for orthodontics based on psychological reasons rather than health factors	79%	21%	
#13 Good dental appearance socially desireable?	91%	9%	
#14 Personality characteristics stereotyped on appearances?	30%	70%	
#15 Are straight, well aligned teeth overly esthetic or false-looking?	11%	89%	
#16 Orthodontic patient becomes better dental patient?	83%	17%	
#17 Orthodontics and increased probability for future success?	78%	22%	
#20 Is a malocclusion stable?	26%	47%	27%
#23 Does growth influence orthodontic treatment?	96%	4%	
#24 Does a good looking smile change the way people think of a person?	93%	7%	

TABLE XV

RANK ORDER

(DENTISTS)

Question	Most	Mid	Least
#12 Rank the following benefits of orthodontic treatment:			
esthetics	42%	26%	32%
function	45%	47%	8%
stability	13%	27%	60%
#22 Rank treatment goals according to importance:			
optimal proximal and occlusal contacts	29%	27%	40%
dentofacial esthetics	22%	44%	31%
oral health and stability	46%	29%	27%

TABLE XVI

BIPOLAR RESPONSES

(ORTHODONTISTS)

Question	Yes	No
#6 Does orthodontics attempt to do more than straighten teeth?	90%	10%
#9 Can orthodontics change a child's self-concept?	88%	12%
#11 Demand for orthodontics based on psychological reasons rather than health factors?	64%	36%
#4 Good dental appearance socially desireable?	90%	10%
#12 Personality characteristics stereotyped on appearance?	21%	79%
#14 Orthodontic patient becomes better dental patient?	95%	5%
#16 Orthodontics and increased probability for future success	88%	12%
#15 Does a good looking smile change the way people think of a person?	83%	17%
#8 Orthodontically treated patients and better lifetime dental prognosis?	93%	7%

TABLE XVII

RANK ORDER

(ORTHODONTISTS)

	Question	High	Mid	Low
#1	Rank the following benefits of orthodontic treatment:			
	esthetics	67%	21%	12%
	function	21%	53%	26%
	stability	12%	26%	62%
#2	dental balance of normal and healthy	79%	10%	10%
	improved facial profile	3%	43%	53%
	esthetic well-aligned denture	17%	47%	36%
#3	Rank treatment goals according to priority:			
	attaining diagnostic cephalometric goals	3%	21%	76%
	correcting skeletal discrepancies	53%	47%	0%
	preventive, dentistry (endo, perio, etc)	43%	33%	24%

TABLE XVIII

MULTIPOLAR RESPONSES
(ORTHODONTISTS)

Question	Response
#10 Is function significantly improved after orthodontic therapy?	
a) yes, greater than 90% of my cases	49%
b) yes, in 60-89% of my cases	29%
c) yes, in 30-59% of my cases	7%
d) less than 30%	4%
e) none	4%
f) effective deterioration of function	4%

TABLE XIX A

FORCED DISTRIBUTION RANKINGS #5

(ORTHODONTISTS)

#5 Rank treatment goals:

A. profile changes (skeletal)
B. soft tissue changes
C. mouth curvature changes
D. facial tension changes
E. lip fullness changes
F. Z-angle changes
G. naso-labial angular changes

Most		Least	
A	23%	A	10%
D	19%	E	12%
B	17%	B	- 14.5%
G	16%	D	
C	10%	F	15.5%
E	8%	G	16.5%
F	7%	C	17.5%

TABLE XIX B

SCALE OF MEAN RANKS #5

(ORTHODONTISTS)

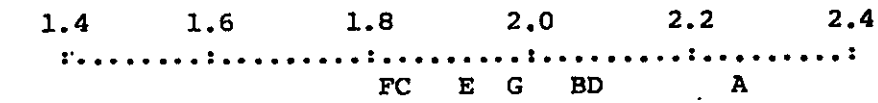


TABLE XX A

FORCED DISTRIBUTION RANKINGS #7

(ORTHODONTISTS)

#7 Treatment goal priorities:

A. placing teeth over basal bone
B. attaining a Class I molar relationship
C. maintenance of pre-treatment intercanine dimension
D. maintenance of pre-treatment intermolar dimension
E. non-extrusion of buccal segments
F. extrusion of buccal segments
G. attaining Class I cuspid relationship
H. maintenance of mandibular plane angle
I. maintenance of occlusal plane angle
J. establishing "normal" tooth inclinations

High (Columns 4+5)		Low (Columns 1+2)	
A	48%	J	6%
G	37%	A	7%
J	28%	G	12%
I	17%	H	15%
H	16%	C	17%
B, E	-14%	D, B	-24%
C, D	-12%	I	26%
F	8%	E	29%
		F	40%

TABLE XX B

SCALE OF MEAN RANKS #7

(ORTHODONTISTS)

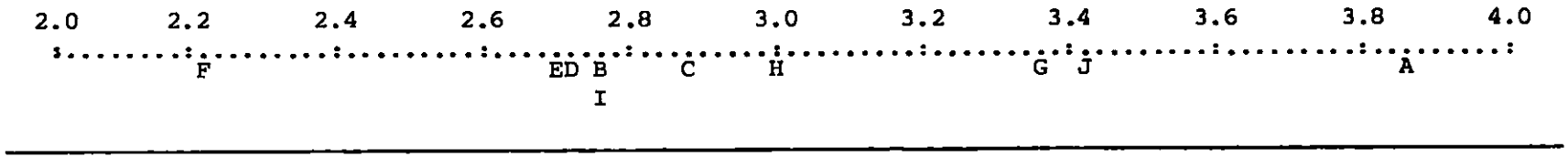


TABLE XXI A

FORCED DISTRIBUTION RANKINGS #13

(ORTHODONTISTS)

#13 Ranking of treatment goals:

A. profile improvement
B. soft tissue improvement
C. oral health improvement
D. straightness of teeth
E. improved functional occlusion
F. improved esthetics
G. Class I molar/cuspid relationship

High		Low	
E	25%	C	6%
C	22%	E	7%
G	13%	F	-13%
A	12%	A	
F	11.5%	G	18%
D	9%	B	20%
B	7%	D	23%

TABLE XXI B

SCALE OF MEAN RANKS #13

(ORTHODONTISTS)

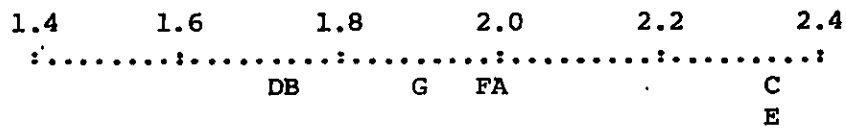


TABLE XXII

RESPONSE COMPARISONS A

RESPONSE COMPARISONS
BIPOLAR RESPONSES

Demand for orthodontics based on psychological reasons rather than health factors.

		Yes	No
D.S.	#11	92%	8%
D.D.S.	#11	79%	21%
Ortho.	#11	64%	36%

RESPONSE COMPARISONS
BIPOLAR RESPONSES

A good looking smile changes the way people think of a person.

		Yes	No
Pat.	#10	67%	33%
Par.	#17	78%	22%
D.S.	#24	89%	11%
D.D.S.	#24	93%	7%
Ortho.	#15	83%	17%

RESPONSE COMPARISONS
BIPOLAR RESPONSES

A good dental appearance is socially desirable.

		Yes	No
Par.	#25	100%	0%
D.S.	#13	95%	5%
D.D.S.	#13	91%	9%
Ortho.	#4	90%	10%

RESPONSE COMPARISONS
BIPOLAR RESPONSES

Self-image will improve with treatment.

		Yes	No
Par.	#24	93%	7%
D.S.	#10	100%	0%
D.D.S.	#10	99%	1%
Ortho.	#9	88%	12%

RESPONSE COMPARISONS
BIPOLAR RESPONSES

Personality characteristics stereotyped on appearance.

		Yes	No
Par.	#22	71%	29%
D.S.	#14	48%	52%
D.D.S.	#14	30%	70%
Ortho.	#12	21%	79%

RESPONSE COMPARISONS
BIPOLAR RESPONSES

Orthodontics is painful.

		Yes	No
Pat.	#17	52%	48%
Par.	#12	67%	33%

TABLE XXIII

RESPONSE COMPARISONS B

RESPONSE COMPARISONS

BIPOLAR RESPONSES

Orthodontic patient becomes a better dental patient.

		Yes	No
Pat.	#7	87%	13%
Par.	#27	98%	2%
D.S.	#16	70%	30%
D.D.S.	#16	83%	17%
Ortho.	#14	95%	5%

RESPONSE COMPARISONS

BIPOLAR RESPONSES

Orthodontics does more than straighten teeth.

		Yes	No
Pat.	#13	81%	19%
Par.	#29	91%	9%
D.S.	#5	87%	13%
D.D.S.	#5	82%	18%
Ortho.	#6	90%	10%

RESPONSE COMPARISONS

BIPOLAR RESPONSES

Improved smile and future success.

		Yes	No
Pat.	#15	76%	24%
Par.	#20	79%	21%
D.S.	#17	62%	38%
D.D.S.	#17	78%	22%
Ortho.	#16	88%	12%

TABLE XXIV

RESPONSE COMPARISONS C

Opinions about orthodontics came from?

	Pat. #11	Par. #9	D.S. #2
TV, newspapers, etc.	1%	2%	3%
Friends, relatives	28%	19%	19%
Personal observations	49%	41%	23%
Your general dentist	8%	19%	6%
Your orthodontist	13%	20%	7%
Dental school to date	NA	NA	41%

What happens in orthodontic treatment?

	Par. #15	D.S. #4
Guidance of growth	18%	30%
Expansion of jaws	7%	8%
Extraction of teeth	29%	14%
Straightening of teeth	46%	32%
None of the above	NA	1%
Other	NA	14%

RESULTS AND DISCUSSION

Patients

The patients were evenly distributed, 52% were males and 48% females. This is unusual since parents tend to seek orthodontic treatment more readily for their daughters (Baldwin et al., 1967), which accounts for the numerical preponderance of girls in most orthodontic clinics and offices. The explanation commonly offered is that differences are due to sexual role expectations prevalent in our society. The data from this present study does not support this contention. Approximately 60% were 13-15 years old and over 90% were 13 years or older. Only 5% were "only child" and the remaining were evenly distributed among the oldest, middle or youngest child.

Approximately 90% felt they needed braces and wearing braces would make them better dental patients. About three-fourths reported comments about their teeth from their peers. This contrasts with Baldwin and Barnes who reported nearly half of a large sample of candidates for orthodontic treatment as never being teased about their malocclusion, while only 10% were teased with any frequency. It appears as though the present study supports teasing as a possible motivating factor, more so than previous studies. Seventy-five percent of patients in the present study felt that an improved smile would increase their probability for future success, whereas only

67% felt that an improved smile would affect the way others think about them.

Fifty-two percent of the patients considered orthodontics to be a painful experience. Eighty-one percent felt that orthodontics attempts to do more than just straighten teeth.

When asked who first suggested orthodontics, these patients responded that 33% were first contacted by their dentist, 44% by a parent, 9% self-initiated and 4% a friend. Forty-nine percent responded that their source of opinion about orthodontics came from personal observation. Forty-four percent considered their need for treatment to be for dental health reasons, 37% for appearance, 13% because of parental desire and 2% because their peers were being treated. This strong parental influence is consistent with previously reported data.

The patients were asked to distribute reasons for orthodontic treatment. "Crooked" and "bucked" teeth were considered most important. Of least importance were: unsightly smile, poor facial profile, overbite and too big or too small of jaws. It is interesting to note that breathing problems were of high priority on the most important column as well as on the least important column. Evidently, patients either consider this type of condition an indication for orthodontic treatment or are unable to relate the two.

When considering features related to dental and total facial appearance, straightness of teeth was, by far, the most important, followed by whiteness of teeth. Obviously, whiteness of teeth is

something that the orthodontic practitioner is unable to effectively change. Of least importance were fullness of lips and showing of gingival tissue when smiling, which are of great concern to many orthodontists.

RESULTS AND DISCUSSION

Parents

More than three-quarters of the respondents were mothers of the clinic patients. Over 80% were mothers of 3 or more children which were fairly evenly distributed among oldest, middle, and youngest in their particular families. In almost half of the cases, the child being treated was the family's first experience with orthodontics (thirty-six percent of the parents had previous care for another child, while only 9% of the parents had orthodontics).

In an attempt to ascertain data on the socio-economic status of the sample, only questions of family income and educational level were asked. Socio-economic status, however, includes other variables such as place of residence, occupation, race and religion. The present results show that the socio-economic levels of the families were distributed across a wide spectrum.

Most opinions about orthodontics were reported as arising from personal observations, with 57% of parents stating that they were aware of a problem and only 34% being referred for treatment by their general dentist. Parents responded that crooked teeth is the single most important determinant for treatment, followed by too many teeth and an overbite. When asked what occurs during treatment, one-half responded "straightening of the teeth" and almost one-third said "extraction of teeth."

In the present study, the decision to proceed with treatment was consistently attributed to the mother, confirming the results of Baldwin and Barnes (1965). One can understand why the mother usually makes the decision to initiate orthodontic treatment as she is closest in everyday contact with her child and could be the first to notice a dental or facial abnormality. It appears that the father's role typically seems to be to provide consent and financial support, rather than initiative and follow-up. It is the mother who will usually be responsible for transportation to and from the orthodontic office, and during the course of treatment most consultation will occur between the orthodontist and the mother, thereby increasing her role in the orthodontic treatment of the child. This appears to be consistent with parental role expectations in our society, as the father traditionally is the bread-winner and the mother generally rears the children. In this context health care responsibilities in general appear to rest traditionally with the mother. It will be interesting to see whether change will occur as more children of career-oriented mothers approach the age of orthodontic treatment. The present investigation also reveals an appreciation of straight teeth as a primary motivating factor for seeking orthodontic treatment. This may even be more important to the parent (especially the mother) than to the child, as suggested in a study by Virolainen (1967).

When asked about twins (one boy and one girl) and the availability of resources for only one treatment, one-third responded,

"I'd treat neither" although almost 60% would treat the girl, as expected. This correlates with sexual role expectations as reported by Baldwin and Barnes (1965).

Another interesting response is that two-thirds of the parents consider orthodontics to be painful, remembering that only 9% reported being treated themselves. Only 13% reported that their children minded wearing braces, in contrast to the patients who reported orthodontics to be painful in 52% of the cases.

Other noteworthy results include, 56% of parents consider malocclusion to be inherited, less than half of the parents questioned would want a child to wear braces for only one crooked tooth. Thirty-eight percent of the parents surveyed were aware that their child had been ridiculed with regard to dentofacial appearance. This response appears to be significantly greater than previously reported. It is expected that children will receive ridicule about their appearance, but it is uncertain as to just how cognizant parents are of this ridicule. Some children approach their parents with unhappiness arising from peer reactions, while others do not want to discuss their problem, prefering perhaps to "wish" it away. All of these assumptions support teasing as a possible motivating factor which needs further consideration.

All parents considered a good dental appearance to be socially desirable. A large majority reported that a good-looking smile changes peoples' attitude about a child and may imply certain traits such as sincerity, conscientiousness, etc. Again, a large majority said that a child's poor self-image could be attributed to

malocclusion and that their self-image would improve with treatment. Most agreed that submitting to orthodontic treatment leads a child to becoming a better dental patient, that orthodontics may reflect upon future success, and that orthodontics attempts to do more than just straighten teeth.

This study suggests that parents realize that physical attractiveness often affects how society influences their child and whether the child will be successful in social relationships. The results also reveal that parents consider orthodontic treatment necessary for future success. These parents concur that an esthetic appearance is socially desirable and straight teeth are attractive. Thus, the child will probably be more favorably accepted by other people and will thereby have increased probability for future success.

RESULTS AND DISCUSSION

Dental Students, Dentists and Orthodontists

Forty-five percent of the dental students surveyed had received orthodontic treatment. Two-thirds reported their opinions about orthodontics arose from personal observations and dental school training. The dentists questioned generally do not practice orthodontics, although 45% reported that most of their patients in need of orthodontic care inquire about the possibility of being treated orthodontically. However, most of the dentists reported that less than 40% of their patients actually receive the necessary orthodontic treatment.

Both dental students and dentists realize the necessity for extraction of permanent teeth. The majority of dentists perceive the side effects of orthodontics as minimal in contrast to dental students who appear to be unsure about the side-effects. Thirty-seven percent of dentists and 55% of dental students would evaluate an orthodontically treated case while still in the retention phase of treatment.

Almost all the dentists and two-thirds of the dental students felt that they could recognize orthodontic problems and almost all responded that functional problems such as speech, breathing and mastication were indications for treatment. Only 27% of the dentists

and half the students considered an untreated malocclusion to be stable. A larger majority of dentists (79%) and dental students (92%) agreed that much of the orthodontic demand is based on psychological factors rather than the family's understanding of health needs. Only 64% of the orthodontists concurred with this opinion.

Almost all the dentists and dental students consider a good dental appearance to be socially desireable, while 10% of the orthodontists surveyed disagree. Most dental students, dentists and orthodontists responded that orthodontics could change a child's self-concept and most agreed that a nice smile changes the way people think of a person. Yet 48% of the dental students 30% of the dentists and only 21% of the orthodontists felt that personality characteristics could be stereotypically based on dental appearance. Eight percent of the dental students and 11% of the dentists reported that straight, well-aligned teeth were overly esthetic or false-looking.

When considering an older potential patient (35 years old with a mild Class II Division 1 malocclusion, good dental arch alignment, excellent periodontal health, no temporomandibular joint problems and pleasing esthetics), 19% of the dental students and 12% of the dentists would recommend treatment. This response appears to be consistent with the increasing awareness and utilization of adult orthodontics. However, when a 12 year old child with similar dentition was considered, only 58% of the dental students and 60% of the dentists suggested treatment. This response seems to be remarkably

low, since a 12 year old Class II patient is a probable candidate for orthodontic therapy. Clearly, there appears to be a failure of communication between the dentists and the orthodontists, for a Class II Division 1 patient can certainly benefit from facial profile changes in orthodontic treatment. It may be assumed that 40% of the dentists would not refer such cases because of the existence of well-aligned dental arches.

Consistently, almost all the dentists and dental students realize that growth influences treatment and most felt that orthodontics does attempt to do more than just straighten teeth. When dental students were asked what occurs during orthodontic treatment, 30% responded guidance of growth and 32% said straightening of teeth.

Seventy percent of the dental students 80% of the dentists and 95% of the orthodontists agreed that the orthodontically-treated child will generally be a better dental patient. Also, most agreed that orthodontics may increase the probability for future success.

Both the dental students and the dentists were asked to rank the same treatment goals (in different question terms). Both sets of responses were inconsistent implying that they really do not have clearly decided treatment goals (see Tables XII and XV).

A relatively small but significant percentage of responses provided unexpected results among the orthodontists surveys. Ten percent of the orthodontists feel that treatment merely attempts to straighten teeth in most "routine" cases. Also, 10% do not consider a good dental appearance to be socially desirable. Seventeen percent did not think that a good looking smile affects the way people think of a person! Seven percent indicated that an orthodontically treated patient does not have a better dental prognosis than an untreated individual. Even more unusual is that only 64% agree that much of the demand for orthodontic treatment is based on psychological factors rather than the patients' and their familys' understanding of health needs.

Only 21% of the orthodontists surveyed felt that personality characteristics can be stereotypically based on dental appearance. Eighty-eight percent felt that orthodontic treatment usually changes a youngster's self-concept.

Less than half the orthodontists reported a significant improvement in function after orthodontic therapy (for 90% of their cases), 4% reported no significant improvement, and 4% reported an effective deterioration of function after treatment.

Esthetics was ranked as the most important treatment goal for orthodontists followed by function and stability in that order. A dental balance of normal and healthy was considered most critical, followed by an esthetic well aligned dentition, and an improved

facial profile. Correcting skeletal discrepancies was reported to be most important and attaining diagnostic cephalometric goals was least significant.

In forced distribution rankings of treatment goals, profile (skeletal) changes were considered to be most important along with soft tissue changes. Of least importance were mouth curvature changes, Z-angle changes, and naso-labial angular changes. In a similar question of treatment goal priorities, placing teeth over basal bone, establishing "normal" tooth inclinations and attaining a Class I cuspid relationship were considered of high priority. Of lowest priority were extrusion (or non-extrusion) of buccal segments and maintenance of occlusal plane angle. Finally, improved functional occlusion and oral health improvement were given highest priority compared to the lowest priority soft tissue improvements and straightness of teeth. This reaffirms the theory that the treatment priorities and motivations wary significantly from patient-parent to orthodontist.

SUMMARY AND CONCLUSIONS

The purposes of this investigation were to study the social and psychological factors which influence parents and/or patients to seek orthodontic treatment. Also, the perceptions of parents, patients, dental students, general dentists, and orthodontists were examined in relationship to their needs, objectives and goals in orthodontics. Five questionnaire surveys were used to collect this information.

Clearly, more research is necessary to resolve still unanswered questions about orthodontic motivation and its sociological and psychological dimensions. How particular motivational factors affect the patient's cooperation during treatment needs to be assessed. There are however, several basic clinical implications from the results of this study. First, identification of the motivational factors causing patients and parents to seek treatment may offer the orthodontist valuable insight to his consultation approach. He may also utilize this information to obtain better cooperation from patient and parent. Since the mother plays a significant role in the total orthodontic experience, the orthodontist should interact with the mother as well as the patient during the course of treatment.

Teasing appears to have a significant effect on orthodontic attitudes before and/or during treatment. Another previously held

conception is that more females are being treated than males. This was untrue for the present study.

The implication is that factors such as the desire for straight teeth, esthetic appearance, social desireability and conformity, and dental health usually form the basis for motivation when seeking orthodontic treatment. The dentist usually suggests that orthodontics is needed, but the initiative to proceed usually rests with the patient's mother. The parents' decision to seek orthodontic care is predicated on the desire to provide their children with social desireability and to maximize potential for success in the future. There also appears to be a socio-economic class influence affecting parental motivation toward orthodontic treatment associated with needs of social acceptance.

The results of this study imply that one or several identified motivational factors may influence a family when contemplating orthodontic treatment. Obviously each individual family unit functions differently. Orthodontic care has previously been utilized primarily by higher socio-economic classes; however, with third party payment, orthodontic care today is much more widely available. With the identification of major motivational factors, the next logical approach suggests that motivation on separate cultural and socio-economic levels be investigated, paying particular attention to race and nationality.

The specialty of orthodontics has the responsibility of making a concerted effort to further educate patients, parents, dental students and dentists, for there seems to be some misleading information being circulated. It is critical that the orthodontic profession further consider the motivations and goals of patients and parents and treat them accordingly.

As a result of this investigation, the following conclusions were drawn.

Patients and Parents

1. Patients consider straightness of teeth to be the most important feature of dental appearance and among the most important reasons for orthodontic treatment.

2. Patients and parents consider crooked teeth, bucked teeth, and speech problems, in that order, to be of highest priority for seeking treatment.

3. Because 75% of the patients reported having received ridicule with regard to their dental or facial appearance, this circumstance appears to represent a significant motivational factor on the part of the patient (not parent) in seeking orthodontic treatment.

4. Three-fourths of the patients indicated that an improved smile would increase their probability for success in life, and 87% stated that orthodontics has also helped them to become a better dental patient in general.

5. Most of the parents' opinions about orthodontics have arisen from personal observations, consistent with the responses of patients.

6. Only 38% of parents reported awareness of ridicule concerning their child's dental or facial appearance. This is regarded as an attempt on the part of the child to conceal a rather unpleasant experience with other children.

7. The majority of parents feel that physical attractiveness often affects how society influences their child and whether the child will be successful in social relationships. Parents therefore often consider orthodontics highly desirable to help insure the future success of their children.

8. All parents feel that an esthetic appearance is socially desirable and that straight teeth are an attractive asset to facial appearance.

9. A large majority of parents believe that a child's self-image will improve with orthodontic treatment.

Dental Students and Dentists

1. The dentists surveyed generally do not practice orthodontics and report that 45% of their patients in need of orthodontic treatment inquire about the possibilities of such treatment.

2. Dental students and general dentists agreed that much of the demand for orthodontic treatment is based on psychological factors rather than any basic understanding of actual health needs.

3. A large majority agreed that an orthodontically treated child will generally become a better dental patient, and that orthodontics may increase probability for future success in life (consistent with parents' and patients' responses).

4. A majority of dental students and dentists realize the necessity for extraction of permanent teeth for orthodontic purposes.

5. Almost all the dental students and dentists agreed that a good dental appearance is socially desirable, that a good looking smile can change the way people think of a person, and that orthodontics can change a child's self-concept.

Orthodontists and Comparisons

1. All respondent groups, including orthodontists, strongly agree that orthodontics attempts to do more than merely straighten teeth and that orthodontics can change a child's self-concept.

2. The orthodontists agreed, but to a significantly lesser degree than dental students and dentists, that the demand for orthodontics is based primarily on psychological reasons rather than health factors.

3. All groups strongly agreed that a good dental appearance is socially desirable.

4. While parents felt that personality characteristics can be stereotypically typed on appearance, dental students, dentists and orthodontists disagreed progressively, in order.

5. All groups agreed that an orthodontic patient becomes a better dental patient.

6. All groups agreed that a good-looking smile changes the way people think of a person and that orthodontics may increase the probability of the patient's future success.

7. Most orthodontists agreed that an orthodontically treated patient has a better lifetime dental prognosis.

8. To the orthodontists, primary treatment objectives were esthetics and function, but there was no consistent discrimination of priority between the two. This was also true for dental students and general dentists.

9. The orthodontists reported that correcting skeletal discrepancies was the most important treatment objective, while attaining cephalometric goals was of least importance.

10. Orthodontists considered improved occlusion and oral health improvement to be of higher priority contrasted with soft tissue improvements and straightness of teeth (consistently ranked). This is dramatically opposed to the responses of the other sampled groups. Thus, the approach to orthodontics by providers may not be consistent with goals of recipients and referring dentists.

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APPENDIX I

PATIENT QUESTIONNAIRE (63 RESPONSES)

Directions: Please answer the questions on the answer sheet. Circle all that apply.

1. I am a _____.

   a. boy (33)
   b. Girl (30)

2. My age is _____.

   a. 5-8 years (0)
   b. 9-10 years (0)
   c. 11-13 years (6)
   d. 13-15 years (37)
   e. over 15 (20)

3. I am _____ child in your family.

   a. the oldest (17)
   b. a middle (23)
   c. the youngest (20)
   d. an only (3)

4. Do you think that you need braces?

   a. yes (57)
   b. no (6)

5. Who first suggested that you see an orthodontist?

   a. my mother (19)
   b. my father (17)
   c. myself (7)
   d. my dentist (25)
   e. a friend (3)
   f. other (5)

6. What do you think that wearing braces will do for you? Please circle all that apply.

   a. make my crooked front teeth look straight (28)
   b. correct my bite (27)
   c. improve my overbite (26)
   d. change my appearance (28)
   e. make my mouth healthier (13)
   f. other (7)

7. Do you think that wearing braces will make you a better dental patient in the future?

   a. yes (55)
   b. no (8)

8. Have you ever had any of the following problems?

   a. difficulty biting into apples because your front teeth don't come together (10)
   b. difficulty cleaning your teeth because of their crooked arrangement (9)
   c. chipping or cracking teeth because they stick out too far (4)
   d. not smiling because you were embarrassed (9)
   e. none of the above (37)

9. Why do you think that orthodontic treatment is necessary?

   a. for appearance--to develop an attractive smile (33)
   b. for dental health reasons (39)
   c. because all my friends are being treated (2)
   d. because my parents consider them important (12)
   e. other; please list (3)

10. Do you think that a good looking smile will change the way other people think about you?

    a. yes (42)
    b. no (21)

11. Most of your opinion(s) about orthodontics comes from _____.

    a. TV, newspapers, etc. (1)
    b. what other people have told you (friends, relatives, teachers) (21)
    c. what you have observed on your own (37)
    d. what your dentist told you (6)
    e. what your orthodontist told you (10)

12. Who do you think needs braces? Please rank the following according to which are most important and which are least important by filling in the boxes with the appropriate letter.

	Least 1	2	Average 3	4	Most 5
a. someone who has "crooked" teeth	3	10	17	8	23
b. someone who has "bucked" teeth	5	10	19	12	21
c. someone who cannot bite apples or some other types of food	10	8	20	16	8
d. someone whose jaws are too big	13	21	18	8	2
e. someone whose jaws are too small	14	12	21	8	5
f. someone who has too many teeth	6	6	32	12	6
g. someone who has too few teeth	9	19	24	7	2
h. someone who has one jaw which is too big and the other which is too small	4	8	26	18	7
i. someone who has an overbite	6	12	29	15	5
j. someone who has speech problems	3	16	17	14	11
k. someone who has a breathing problem	15	10	14	7	14
l. someone who has a bad bite	8	7	13	19	4
m. someone who has an unhealthy mouth	3	11	24	14	8
n. someone who has an unsightly smile	11	16	12	14	4
o. someone who has a poor facial profile	12	12	19	11	4

13. Do you think that orthodontics attempts to do more than straighten teeth?

    a. yes (51)
    b. no (12)

14. Do any of your friends comment about your smile or the way your teeth look?

    a. yes (47)
    b. no (16)

15. Do you think that looking better will make you more successful later in life?

    a. yes (48)
    b. no (15)

16. Which features are most important in terms of dental and total appearance? Please rank the following features by placing a letter in the appropriate box.

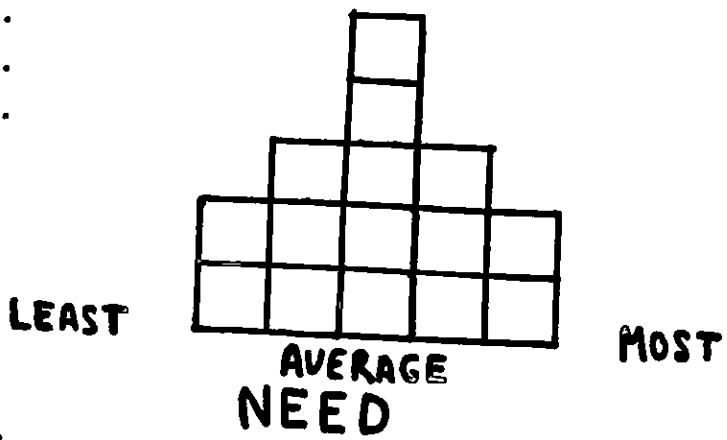
	Least 1	2	Average 3	4	Most 5
a. whiteness of teeth	4	10	12	26	10
b. straightness of teeth	1	3	14	19	27
c. fullness of lips	19	20	18	5	0
d. curvature of mouth	2	14	29	8	6
e. large chin or little chin	8	23	25	4	4
f. location of upper teeth (either sticking way out or way in)	4	7	19	22	6
g. many teeth showing in a smile	4	14	27	13	2
h. straight facial profile	1	10	33	17	2
i. showing some gums in a smile	19	22	9	8	4

17. Do you think that orthodontic treatment is painful?

a. yes (33)
b. no (30)

ANSWER SHEET

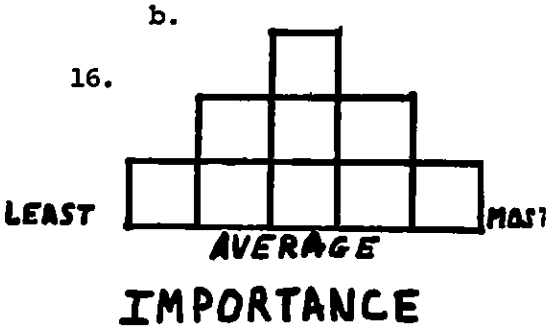
1. a.
   b.
2. a.
   b.
   c.
   d.
   e.
3. a.
   b.
   c.
   d.
4. a.
   b.
5. a.
   b.
   c.
   d.
   e.
   f.
6. a.
   b.
   c.
   d.
   e.
   f.
7. a.
   b.
8. a.
   b.
   c.
   d.
   e.
9. a.
   b.
   c.
   d.
   e.
10. a.
    b.
11. a.
    b.
    c.
    d.
    e.
12.



13. a.
    b.
14. a.
    b.

PATIENT

15. a.
    b.
16.



17. a.
    b.

APPENDIX II

PARENT QUESTIONNAIRE (45 RESPONSES)

Directions: These first questions are simply a profile analysis of the individual filling out the questionnaire. Please circle the appropriate letter(s).

1. You are the:

   a. mother (34)
   b. father (11)
   c. other (0)

2. Your marital status:

   a. married (43)
   b. separated (0)
   c. divorced (2)
   d. widowed (0)
   e. single (0)

3. Your age:

   a. 30 years or under (2)
   b. 31-40 (17)
   c. over 40 (26)

4. How many children do you have?

   a. 1 (1)
   b. 2 (7)
   c. 3 or more (37)

5. Is the child that now requires orthodontic treatment:

   a. the oldest (14)
   b. a middle child (16)
   c. the youngest (14)
   d. an only child (1)

6. Have you ever had previous experience with orthodontics?

   a. yes, I have had orthodontic treatment (4)
   b. yes, another child has been treated (16)
   c. yes, both personally and with another child (3)
   d. yes, my brother or sister was treated (0)
   e. no, this is my first experience (21)

7. How much schooling have you had?

   a. did not finish high school (3)
   b. completed high school (21)
   c. technical or training program (5)
   d. some college (12)
   e. college graduate (7)

8. Your family's approximate yearly income is $_____.

   a. under $10,000 (1)
   b. $10,000-$14,999 (13)
   c. $15,000-$19,999 (14)
   d. $20,000-$24,999 (11)
   e. Over $25,000 (16)

9. Most of your opinions about orthodontics comes from _____.

   a. TV, newspapers, etc. (1)
   b. what other people have told you (friends, relatives) (11)
   c. what you have observed on your own (24)
   d. what your dentist told you (11)
   e. what your orthodontist told you (12)

10. Why did you first seek orthodontic treatment for your child?

   a. you as a parent were aware of a problem (32)
   b. the child was aware of a problem (4)
   c. the dentist advised that your child needs orthodontic treatment (braces) (19)
   d. the child has medical problems for which your physician suggested orthodontic consideration (1)
   e. other; please describe what motivated you to seek orthodontics for your child

11. Why does your child need orthodontic treatment? He/she: Please circle all that apply.

   a. has "crooked" teeth (25)
   b. has "bucked" teeth (12)
   c. can't bite apples or some other types of food (1)
   d. has jaws that are too big (0)
   e. has jaws that are too small (11)
   f. has one jaw which is too big and one that is too small (2)
   g. has too many teeth (16)
   h. has too few teeth (0)
   i. has an overbite (15)
   j. has a speech problem (1)
   k. has a breathing problem (1)

11. continued

l. has a malocclusion (bad bite) (7)
m. has an unhealthy mouth (1)
n. has an unsightly smile (13)
o. has a poor facial profile (9)
p. please list any other factors (1)

12. Do you think that orthodontic treatment is painful?

a. yes (30)
b. no (15)

13. Why do you think that orthodontic treatment is necessary?

a. esthetic (cosmetic) reasons (0)
b. oral health (dental) reasons (3)
c. both of the above (42)

14. Does your child mind wearing braces?

a. yes (6)
b. no (38)
c. maybe, I don't know (1)

15. Do you know what happens in orthodontic treatment? (Circle all that apply)

a. yes, guidance of the growth of the jaws (17)
b. yes, expansion of jaws (7)
c. yes, extraction of teeth (27)
d. yes, straightening of the teeth (43)
e. none of the above (0)
f. other (0)

16. How long do you expect treatment to last?

a. up to six months (0)
b. between six months and one year (0)
c. between one year and two years (28)
d. more than two years (17)

17. Do you think that a good looking smile changes the way people will think of your child?

a. yes (35)
b. no (10)

18. Have other people made your child aware of his dental and/or facial appearance?

    a. yes (17)
    b. no (28)

19. Do you believe that your child's "bad bite" and/or "crooked" teeth are inherited?

    a. yes (25)
    b. no (10)
    c. I don't know (10)

20. Do you think that your child's orthodontic treatment will increase the possibility of success in life?

    a. yes (34)
    b. no (9)

21. If you had twins (one boy and one girl) with similar problems and could only afford one treatment, which one would you consider more important to go ahead with?

    a. the boy (4)
    b. the girl (25)
    c. I'd treat neither (14)

22. Do you think that someone with straight teeth and a pretty smile gives an appearance of sincerity, intelligence and conscientiousness?

    a. yes (32)
    b. no (13)

23. Do you believe that a child's self image is poor because of his or her malocclusion?

    a. yes. (37)
    b. no (8)

24. Do you think that his or her self image would improve with treatment?

    a. yes (42)
    b. no (3)

25. Do you think that a good dental appearance is socially desirable?

    a. yes (42)
    b. no (0)

26. Would you consider braces for a child with only one moderately crooked tooth?

    a. yes (19)
    b. no (23)

27. Will the child who goes to the orthodontist become a better dental patient during future routine visits to your family dentist?

    a. yes (44)
    b. no (1)

28. Which features are most important in terms of dental and total facial appearance. (Please rank the following features by placing a letter in the appropriate box.)

	Least 1	2	Average 3	4	Most 5
a. protruding or receding chin	3	4	12	13	5
b. small or large bones	4	11	15	4	0
c. square or round face	9	10	10	2	1
d. mouth curvature	1	9	12	4	2
e. width of nose	2	13	7	9	0
f. whiteness of teeth	1	5	13	12	4
g. facial tension	0	5	21	7	0
h. fullness of lips	1	19	12	5	0
i. round or square chin	1	9	16	5	0
j. size of mouth	1	8	10	13	1
k. compressed or relaxed lips	2	7	20	5	0
l. length of nose	3	11	6	12	0
m. prominence of cheekbones	3	6	19	7	2
n. protrusion of upper teeth	2	1	6	16	7
o. bow-shaped or straight lips	1	9	10	8	0
p. straightness of teeth	0	2	6	21	15

29. Do you think that orthodontics attempt to do more than just straighten teeth?

    a. yes (40)
    b. no (4)

Thank you for your help in answering this questionnaire.

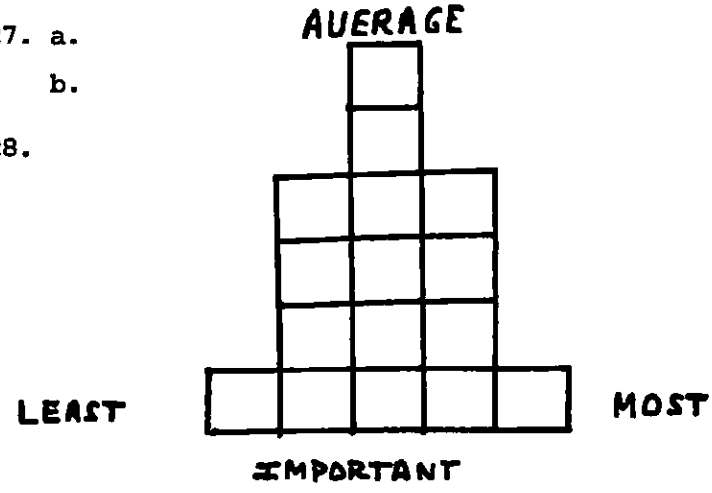
ANSWER SHEET

1. a.
   b.
   c.
2. a.
   b.
   c.
   d.
   e.
3. a.
   b.
   c.
4. a.
   b.
   c.
5. a.
   b.
   c.
   d.
6. a.
   b.
   c.
   d.
   e.
7. a.
   b.
   c.
   d.
   e.
8. a.
   b.
   c.
   d.
   e.
9. a.
   b.
   c.
   d.
   e.
10. a.
    b.
    c.
    d.
    e.
11. a.
    b.
    c.
    d.
    e.
    f.
    g.
    h.
    i.
    j.
    k.
    l.
    m.
    n.
    o.
    p.

PARENTS

12. a.
    b.
13. a.
    b.
    c.
14. a.
    b.
    c.
15. a.
    b.
    c.
    d.
    e.
    f.
16. a.
    b.
    c.
    d.
17. a.
    b.
18. a.
    b.
19. a.
    b.
    c.

20. a.
    b.
21. a.
    b.
    c.
22. a.
    b.
23. a.
    b.
24. a.
    b.
25. a.
    b.
26. a.
    b.
27. a.
    b.
28.



29. a.
    b.

APPENDIX III

DENTAL STUDENT QUESTIONNAIRE (84 RESPONSES)

Directions: Please circle all the appropriate answers on the answer sheet.

1. Have you ever had orthodontic treatment yourself?

   a. yes (38)
   b. no (46)

2. Most of your opinion(s) about orthodontics come from _____.

   a. TV, newspapers, etc. (4)
   b. what other people have told you (friends, relatives) (22)
   c. what you have observed on your own (27)
   d. what your dentist told you (7)
   e. what your orthodontist told you (8)
   f. your undergraduate training to date in dental school (47)

3. Why do you think that orthodontic treatment is most frequently necessary?

   a. usually esthetic (cosmetic) reasons (57)
   b. usually oral health (dental) reasons (25)
   c. please list others (2)

4. Do you know what happens in orthodontic treatment?

   a. yes, guidance of growth (46)
   b. yes, expansion of jaws (13)
   c. yes, extraction of teeth (22)
   d. yes, straightening of teeth (50)
   e. none of the above (2)
   f. other (21)

5. Do you think that orthodontics usually attempts to do more than straighten teeth?

   a. yes (74)
   b. no (12)

6. Do you feel that you can presently recognize orthodontic problems most of the time?

   a. yes (56)
   b. no (28)

7. Consider a 35 year old with a mild Class II Division 1 malocclusion, good dental arch alignment, excellent periodontal health, no temporomandibular joint problems and pleasing esthetics. Would you consider this patient for orthodontic treatment?

   a. yes (16)
   b. no (54)
   c. I don't know (14)

8. If the above were 12 years old, would you consider this patient a likely candidate for orthodontic treatment?

   a. yes (49)
   b. no (54)
   c. not really, if no health problem seems to be involved (20)

9. Do you consider functional factors such as speech, breathing and mastication indications for orthodontic treatment?

   a. yes (82)
   b. no (2)

10. Can orthodontic treatment change a youngster's self-concept?

    a. usually yes (84)
    b. usually no (0)

11. Much of the demand for routine orthodontic treatment is based on psychological factors rather than reasons of health?

    a. I agree (77)
    b. I disagree (7)

12. Consider the following benefits of orthodontic treatment. Rank them from most often beneficial to least often beneficial.

	Most	Mid.	Least
a. esthetics	37	26	21
b. function	36	40	8
c. stability	11	17	54

13. Do you consider good dental appearance socially desirable?

    a. always yes (80)
    b. not necessarily, depending on type of employment, etc. (4)

14. Do you think that personality characteristics (such as sincerity, intelligence and conscientiousness) can be stereotyped based on dentofacial appearance?

    a. generally yes (40)
    b. generally no (44)

15. Do you consider straight, well-aligned teeth to be overly esthetic or false-looking?

    a. yes (7)
    b. no (77)

16. Will the child that goes to the orthodontist become a better patient with his/her family dentist with respect to oral hygiene and regard for dental health?

    a. yes (59)
    b. no (25)

17. An orthodontically treated child has increased probability for personal success?

    a. yes (52)
    b. no (32)

18. How important do you consider the side effects of orthodontic treatment: (root resorption, decalcification, caries, etc.).

    a. these side effects are usually minimal in relationship to benefits of treatment (33)
    b. I consider these side effects as significant (26)
    c. I accept these side effects objectively (25)

19. Consider the extraction of permanent teeth.

    a. I am opposed to the extraction of permanent teeth for orthodontic purposes (2)
    b. I question the need for extraction (12)
    c. I realize the necessity for extraction in many cases (70)

20. Is an untreated malocclusion stable?

    a. yes (44)
    b. no (20)
    c. I don't know (20)

21. Considering relapse following orthodontic treatment, at what point would you evaluate a treated case?

    a. at the time of debanding (5)
    b. 2 months into retention (21)
    c. 6 months into retention (21)
    d. 1 year into retention (9)
    e. 1 year after retention (45)

22. Please rank your orthodontic treatment goals (exceptions) in descending importance; no. 1 being the most important.

	Most	Mid.	Least
a. optimal proximal and occlusal contacts of teeth	18	27	40
b. acceptable dentofacial esthetics	26	34	24
c. reasonable oral health and stability	42	25	18
d. other			

23. Do you think that growth factors significantly influence orthodontic treatment?

    a. yes (81)
    b. no (3)

24. Do you think a good looking smile changes the way people think of a person?

    a. usually yes (75)
    b. not necessarily (9)

Thank you very much for filling out this questionnaire.

DENTAL STUDENTS

ANSWER SHEET

1. a.
   b.

2. a.
   b.
   c.
   d.
   e.
   f.

3. a.
   b.
   c.

4. a.
   b.
   c.
   d.
   e.
   f.

5. a.
   b.

6. a.
   b.

7. a.
   b.
   c.

8. a.
   b.
   c.

9. a.
   b.

10. a.
    b.

11. a.
    b.

12. 1.___(most often)
    2.___
    3.___(least often)

13. a.
    b.

14. a.
    b.

15. a.
    b.

16. a.
    b.

17. a.
    b.

18. a.
    b.
    c.

19. a.
    b.
    c.

20. a.
    b.
    c.

21. a.
    b.
    c.
    d.
    e.

22. 1.___(most)
    2.___
    3.___
    4.___(least)

23. a.
    b.

24. a.
    b.

April 3, 1978

Dear Doctor,

The enclosed questionnaire is part of a research project for my master's degree in orthodontics. A few minutes of your time is needed for your responses. Some of the questions might be difficult to answer because of the oversimplification of the responses provided. I am aware of subjective gray zones that come into play; nevertheless, this is necessary for statistical analyses.

Enclosed you will find a postage-paid return envelope for your convenience. Please do not let the letter get lost in your mass of paper work--reply as soon as possible. I need the data no later than April 20.

Thank you in advance for your time and cooperation.

Sincerely,

Jeffrey S. Weil D.D.S.

Jeffrey S. Weil, D.D.S.

P. S. Please put all responses and additional comments on the enclosed answer sheet.

APPENDIX IV

DENTIST QUESTIONNAIRE (116 RESPONSES)

Directions: Please circle all the appropriate answers on the answer sheet.

1. How long have you been practicing dentistry?

   a. under 5 years (30)
   b. 6-10 years (14)
   c. 11-20 years (24)
   d. over 20 years (48)

2. Do you do any orthodontic treatment?

   a. frequently (9)
   b. seldom (39)
   c. almost never (68)

3. What percentage of patients that you treat actually receive necessary orthodontic treatment, either by yourself or an orthodontist?

   a. 90% or more (9)
   b. 60-89% (19)
   c. between 40-60% (18)
   d. 10-39% (31)
   e. less than 10% (39)

4. What percentage of your patients who need orthodontic treatment first come to you inquiring about the possibility of being treated orthodontically?

   a. 90% or more (34)
   b. 60-89% (18)
   c. 40-59% (12)
   d. 10-39% (22)
   e. less than 10% (30)

5. Do you think that orthodontics usually attempts to do more than straighten teeth?

   a. yes (95)
   b. no (21)

6. Do you feel that you can presently recognize orthodontic problems most of the time?

   a. yes (114)
   b. no (2)

7. Consider a 35 year old with a mild Class II Division 1 malocclusion, good dental arch alignment, excellent periodontal health, no temporomandibular joint problems and pleasing esthetics. Would you consider this patient for orthodontic treatment?

   a. yes (14)
   b. no (88)
   c. I don't know (14)

8. If the above were 12 years old, would you consider this patient a likely candidate for orthodontic treatment?

   a. yes (70)
   b. no (14)
   c. not really, if no health problems seems to be involved (32)

9. Do you consider functional factors such as speech, breathing and mastication indications for orthodontic treatment?

   a. yes (111)
   b. no (5)

10. Can orthodontic treatment change a youngster's self-concept?

    a. usually yes (115)
    b. usually no (1)

11. Much of the demand for routine orthodontic treatment is based on psychological factors rather than reasons of health?

    a. I agree (92)
    b. I disagree (24)

12. Consider the following benefits of orthodontic treatment. Rank them from most often important to least often important.

	Most	Mid.	Least
a. esthetics	49	30	37
b. function	52	55	9
c. stability	15	31	70

13. Do you consider good dental appearance socially desirable?

    a. always yes (105)
    b. not necessarily, depending on type of employment, etc. (11)

14. Do you think that personality characteristics (such as sincerity, intelligence and conscientiousness) can be stereotyped based on dentofacial appearance?

    a. generally yes (35)
    b. generally no (81)

15. Do you consider straight, well-aligned teeth to be overly esthetic or false-looking?

    a. yes (13)
    b. no (106)

16. Will the child that goes to the orthodontist become a better patient with his/her family dentist with respect to oral hygiene and regard for dental health?

    a. yes (96)
    b. no (20)

17. An orthodontically treated child has increased probability for personal success?

    a. yes (91)
    b. no (25)

18. How important do you consider the side effects of orthodontic treatment: (root resorption, decalcification, caries, etc.).

    a. these side effects are usually minimal in relationship to benefits of treatment (52)
    b. I consider these side effects as significant (26)
    c. I accept these side effects objectively (38)

19. Consider the extraction of permanent teeth.

    a. I am opposed to the extraction of permanent teeth for orthodontic purposes (4)
    b. I question the need for extraction (7)
    c. I realize the necessity for extraction in many cases (105)

20. Is an untreated malocclusion stable?

    a. yes (30)
    b. no (55)
    c. I don't know (31)

21. Considering relapse following orthodontic treatment, at what point would you evaluate a treated case?

    a. at the time of debanding (6)
    b. 2 months into retention (7)
    c. 6 months into retention (19)
    d. 1 year into retention (14)
    e. 1 year after retention (80)

22. Please rank your orthodontic treatment goals (expectations) in descending importance; no. 1 being the most important).

	Most	Mid.	Less	Least
a. optimal proximal and occlusal contacts of teeth	33	30	42	4
b. acceptable dentofacial esthetics	25	48	33	3
c. reasonable oral health and stability	51	32	29	1
d. other	3	0	2	77

23. Do you think that growth factors significantly influence orthodontic treatment?

    a. yes (111)
    b. no (5)

24. Do you think a good looking smile changes the way people think of a person?

    a. usually yes (106)
    b. not necessarily (8)

Thank you very much for filling out this questionnaire.

ANSWER SHEET

1. a.
   b.
   c.
   d.

2. a.
   b.
   c.

3. a.
   b.
   c.
   d.
   e.

4. a.
   b.
   c.
   d.
   e.

5. a.
   b.

6. a.
   b.

7. a.
   b.
   c.

8. a.
   b.
   c.

9. a.
   b.

10. a.
    b.

11. a.
    b.

12. 1.___(most)
    2.___
    3.___(least)

13. a.
    b.

14. a.
    b.

15. a.
    b.

16. a.
    b.

17. a.
    b.

DDS

18. a.
    b.
    c.

19. a.
    b.
    c.

20. a.
    b.
    c.

21. a.
    b.
    c.
    d.
    e.

22. 1.___(most)
    2.___
    3.___
    4.___(least)

23. a.
    b.

24. a.
    b.

APPENDIX V

ORTHODONTIST QUESTIONNAIRE (58 RESPONSES)

Directions: Please rank the following treatment goals from highest to lowest priority. Answer all questions on the enclosed answer sheet.

1.

	High	Mid.	Low
a. function	39	12	7
b. stability	12	31	15
c. esthetics	7	15	36

2.

	High	Mid.	Low
a. a dental balance of normal and healthy	46	6	6
b. an improved facial profile	2	25	31
c. an esthetic, well-aligned denture	10	27	21

3.

	High	Mid.	Low
a. attaining dictates of certain angular diagnostic cephalometric goals	2	12	44
b. correcting or affecting skeletal discrepancies	31	27	0
c. preventive periodontics, endodontics, prosthodontics, etc.	25	19	14

4. Do you consider good dental appearance socially desirable?

   a. yes, for everybody (52)
   b. not necessarily, depending on type of employment, etc. (6)

5. Please rank from most to least important

	Least	Mid.	High
a. profile changes (skeletal)	10	19	24
b. soft tissue changes	15	21	18
c. mouth curvature changes	18	23	10
d. changes in facial tension	15	19	20
e. changes in fullness of lips	12	28	8
f. Z angle changes	16	26	7
g. naso-labial angular changes	17	18	16

6. Do you think that orthodontics attempts to do more than just straighten teeth?

   a. yes, in almost all cases (52)
   b. no, in most "routine" cases (6)

7. Please rank your priorities among the following treatment goals by placing the appropriate letter in each box.

	Low 1	2	3	4	High 5
a. placing teeth over basal bone	2	4	14	7	22
b. attaining a Class I molar relationship	10	6	23	10	2
c. maintenance of pre-treatment inter-canine dimension	2	15	29	10	1
d. maintenance of pre-treatment inter-molar dimension	7	12	22	6	3
e. non-extrusion of buccal segments	7	18	16	6	4
f. extrusion of buccal segments	14	16	10	4	2
g. attaining Class I cuspid relationship	4	5	22	17	8
h. maintenance of mandibular plane angle	2	12	20	12	2
i. maintenance of occlusal plane angle	7	15	15	9	4
j. establishing "normal" tooth inclinations	0	7	23	17	6

8. Do you consider orthodontically treated patients to have a better lifetime dental prognosis than untreated patients?

   a. usually yes (54)
   b. usually no (4)

9. Does orthodontic treatment usually change a youngster's self-concept?

   a. yes (51)
   b. no (7)

10. Is function significantly improved after orthodontic therapy?

   a. yes, in more than 90% of my cases (36)
   b. 60-89% (21)
   c. 30-59% (5)
   d. less than 30% (5)
   e. none (3)
   f. effective deterioration of function (3)

11. Much of the demand for orthodontic treatment is based on psychological factors rather than the patients' and their familys' understanding of health needs.

    a. I generally agree (37)
    b. I generally disagree (21)

12. Dentists tend to characterize patients as to dental appearance. Do you think that personality characteristics such as sincerity, intelligence and conscientiousness can be stereotypically based on dental appearance?

    a. generally yes (12)
    b. generally no (46)

13. Please rank the following treatment goals by placing the appropriate letter in each box.

	Low	Mid.	High
a. profile improvement	14	30	14
b. soft tissue improvement	22	24	8
c. oral health improvement	7	21	25
d. straightness of teeth	25	20	10
e. improved functional occlusion	8	21	28
f. improved esthetics	14	28	13
g. Class I molar and/or cuspid relationship	20	22	15

14. Will the child who goes to the orthodontist generally become a better dental patient with respect to oral hygiene responsibility and regard for general dental health?

    a. usually yes (55)
    b. usually no (3)

15. Do you think a good looking smile affects the way people think of a person?

    a. absolutely (48)
    b. not necessarily (10)

16. An orthodontically treated child has increased probability for personal success?

    a. I agree (51)
    b. I disagree (7)

Thank you very much for your time in filling out this questionnaire.

ANSWER SHEET

ORTHODONTIST

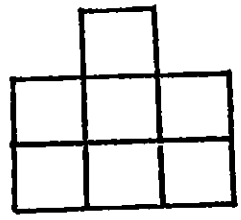
1. 1.___(highest priority)
   2.___
   3.___(lowest priority)

2. 1.___
   2.___
   3.___

3. 1.___
   2.___
   3.___

4. a.
   b.

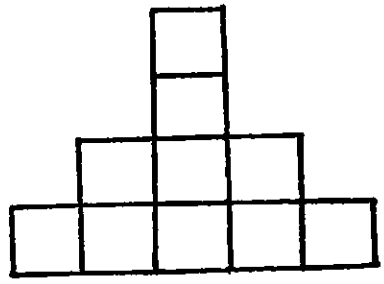
5.



LEAST MOST

6. a.
   b.

7.



LESSER HIGH

PRIORITY

8. a.
   b.

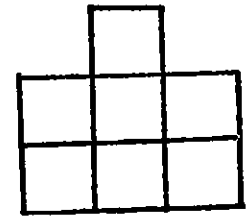
9. a.
   b.

10. a. d.
    b. e.
    c. f.

11. a.
    b.

12. a.
    b.

13.



LESSER HIGH

PRIORITY

14. a.
    b.

15. a.
    b.

16. a.
    b.

If you have any general comments or any comments on specific questions, please feel free to note them on the reverse side of the answer sheet.

Thank you

12. Who do you think needs braces? Please rank the following according to which are most important and which are least important by filling in the boxes with the appropriate letter.

	Least 1	2	Average 3	4	Most 5
a. someone who has "crooked" teeth	3	10	17	8	23
b. someone who has "bucked" teeth	5	10	19	12	21
c. someone who cannot bite apples or some other types of food	10	8	20	16	8
d. someone whose jaws are too big	13	21	18	8	2
e. someone whose jaws are too small	14	12	21	8	5
f. someone who has too many teeth	6	6	32	12	6
g. someone who has too few teeth	9	19	24	7	2
h. someone who has one jaw which is too big and the other which is too small	4	8	26	18	7
i. someone who has an overbite	6	12	29	15	5
j. someone who has speech problems	3	16	17	14	11
k. someone who has a breathing problem	15	10	14	7	14
l. someone who has a bad bite	8	7	13	19	4
m. someone who has an unhealthy mouth	3	11	24	14	8
n. someone who has an unsightly smile	11	16	12	14	4
o. someone who has a poor facial profile	12	12	19	11	4

13. Do you think that orthodontics attempts to do more than straighten teeth?

    a. yes (51)
    b. no (12)

14. Do any of your friends comment about your smile or the way your teeth look?

    a. yes (47)
    b. no (16)

15. Do you think that looking better will make you more successful later in life?

    a. yes (48)
    b. no (15)

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