

# Psychology Of The Use Of The Headgear

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## INTRODUCTION

The purpose of this investigation was to determine the relative effects of various factors on motivation of patients to use the headgear during orthodontic treatment.

## HYPOTHESES

1. That the success of orthodontic treatment and motivation are directly related.
2. That the duration of treatment can be shortened by high motivational level of the patient.
3. That psychological factors influence the motivation of the patient for orthodontic treatment.
4. That consistency in the use of the headgear affects the success of orthodontic treatment.
5. That psychological factors influence consistency in the use of the headgear.

## METHOD

The study comprises thirty boys and thirty-seven girls for a total of sixty-seven retained cases. These cases reached retention during a consecutive twelve month period. Immediately following debanding and the making of impressions, each patient was submitted two questionnaires.

## ATTITUDES QUESTIONNAIRE

The first questionnaire was on Headgear Attitudes with thirty-five items taken from "California Test of Personality, 1953". The complete ques-

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tionnaire was considered inappropriate, so only selected items were chosen.

## COMPLETED CASES QUESTIONNAIRE

The second questionnaire dealt solely with the headgear and its use. Included were fourteen multiple-part questions where Yes or No were to be checked in separate columns. Two exceptions existed; in question 2b, where the patient was asked to circle the daily average of hours that the headgear was worn; and in question fourteen which asked, "What could have been done to give additional incentive to wear your headgear more?"

Following these, four questions requiring written answers, were asked:

1. Is there anything hard for you to understand?
2. Is there anything that you did not want to answer?
3. Was there any other answer that you would have given other than yes or no?
4. Was there anything the questionnaire did not ask that you would like to say about the headgear?

## PROCEDURE

By the Q sort technique, the subjects were ranked from highest to lowest according to the orthodontist's estimate of the subject's motivation. The Q sort is a method used to rank abstract variables or ones that cannot be measured in units.

The author also ranked each subject from highest to lowest on success of orthodontic treatment using plaster study models and cephalometric lateral head films.

The obtained correlation of .82 be-

tween the degree of success of orthodontic treatment and the orthodontist's estimate of motivation is significant and would indicate that the patient's lack of motivation as perceived in retrospect was a definite factor in the degree of success of the orthodontic treatment.

The difficulty of correction of each individual case was never eliminated. If the correlation between success and motivation is .82 without this elimination, it could be hypothesized that the correlation between success and motivation might have been even higher if all cases had been equally difficult to correct.

The correlation of the orthodontist's posttreatment estimate of patient motivation with the response on the Attitudes questionnaire of .29 is too low to make the use of these items from the "California Test of Personality" sufficiently predictive for use with individual patients. However, certain of the items show significant relationship.

No exact correlation could be ascertained when the Attitudes questionnaire on personality was compared with ranking of success of treatment. However, a trend seemed to exist when patients who did well on the Attitudes questionnaire appeared at or near the top of the list in success of treatment and in motivation (4 out of first 10), (0 out of last 10).

In order to establish the correlation of rank differences, Spearman's rho formula for ranked groups was used in the computation.

Thus the correlation of success with the shortest duration was .41. The correlation of motivation with the Attitudes questionnaire was .29. The correlation of motivation with duration was .61 and the correlation of success with motivation was .82.

Of the top 16 in Motivation, 9 are boys, 7 are girls. Of the lowest 16, 11 are girls.

The score on the Attitudes questionnaire had little to do with the success of orthodontic treatment; of the top quartile of the 67 cases, in rank of success, the range of scores on the Attitudes questionnaire was from 4.5 to 66.5. The Attitudes questionnaire seems much more highly correlated with lack of success, since, of the lowest quartile on success, only 2 scored in the top quartile and 9 of 16 scored in the lowest quartile. Seven of the 16 who ranked highest in Motivation also scored in the top quartile on the Attitudes questionnaire. Ten of those in lowest quartile on Motivation were also in the lowest quartile on the Attitudes questionnaire.

In ranking the success of treatment of the individuals from 1 to 67, the following statistics were rather interesting. The top ten cases included 8 boys and 2 girls; the top twenty cases included 12 boys and 8 girls. Of the lowest ten cases 5 were boys and 5 were girls; of the lowest twenty cases, 6 were boys and 14 were girls. From this it could be assumed that the effect of the hairstyling upon headgear application in females was a factor deserving consideration, because high achievement individuals appear on both lowest and top groups. Mental ability apparently had no effect upon the patient's attitude toward headgear usage or his subsequent success of treatment. In defense of the mentally gifted individual, it can be said that there are more demands upon his time and allocation of it because of his greater variety of interests.

A record was kept on broken appointments; in the top half of the cases, a total of 57 broken appointments occurred with 74 in the bottom half of the list. Of the top ten, there were a total of 18 with 35 in the lowest ten patients. The broken appointment may be evidence of an unconscious resistance to treatment and, therefore, an index of motivation.

Headgear breakage occurred only 4 times in patients in the lower half and in the upper half it happened 25 times. This, it is felt, was the result of wearing the headgear a greater number of hours by the patients in the upper strata, and not the result of malicious damage to the appliance.

Another factor that was influential were deaths in the immediate family (3 mothers, 1 father) that occurred during treatment. These events resulted in loss of headgear time, broken appointments and apparent lack of incentive, at least for a period of time.

#### FINDINGS

Of the total 67 cases in this study, extraction was employed in 46 cases, or in 60% of the individuals. This varied in number from 8 deciduous teeth and 4 bicuspid to 2 bicuspid. Four bicuspid only were removed in 58% of the cases.

Duration of treatment ranged from 4 months to 46 months; the average length of time for the wearing of appliances from initial banding and/or beginning of headgear application was 28.3 months.

Average age at beginning of treatment for boys was 12.17 years and for girls was 12.30 years. The average age at completion of treatment for boys was 14.47 years and for girls was 14.70 years.

The answers for both questionnaires were tabulated separately for boys and for girls and then a total for each was made. A key sheet was made for the Attitudes questionnaire. The stated daily average of hours of headgear use was averaged for the two groups.

#### ANSWERS FOR THE COMPLETED CASES QUESTIONNAIRE

1. Sixty-six felt that instructions regarding use of the headgear were adequate. One gave no response.

2. Thirty-seven stated that they did wear the headgear everyday as instructed; twenty-four did not.
  - a. The daily average of hours as indicated by the patient's circling of indicated times was taken at face value and no investigation was made of its accuracy, although each patient was given a chart to record his daily use in hours. The average time for boys was 11.34 hours per day, and for girls it was 11.45 hours per day. Each patient had been requested to wear his headgear a minimum of fourteen hours during each twenty-four hour period. It was specifically stated to each patient that he was not to wear his headgear to school or out in public, but that he might if he cared to do so. The suggestion was made that the headgear be worn immediately upon returning home from school in the afternoon, wear it until dinner time, take it off to eat, brush his teeth, wear it all evening while studying or watching television, have it on well in advance of bedtime and wear it all night during the sleeping hours.
  - c. At the beginning of treatment fifty-four wore it as instructed; twelve did not.
  - d. At or near the end of treatment forty-six wore it as instructed and eleven stated they did not.
  - e. When they knew treatment would soon be completed forty-nine said they did and eight did not wear it as instructed. Some did not reply.

Question 2a, "Did you wear the headgear as instructed every day?", requires some elaboration in its commentary on the answers. This question was not answered by one boy and four girls. The

three girls were well down on the list, two of them being ranked 62 and 67 of the 67 cases in the study. Because of their inconsistency in wearing the headgear, they chose to ignore the question. Other than this there was little correlation between wearing it every day and the success of treatment. The important factor, it may be assumed, would be the total number of hours that the headgear was worn during treatment, or during a specified unit of time, such as a week or a month.

3. Thirty-seven felt that the headgear affected their comfort and thirty did not feel this way.
4. With girls, twenty-three believed that hair style did affect wearing of the headgear and twelve did not. No answer received from two patients.
5. The high-pull headgear did create cheek depressions on thirty-nine, but not on fifteen patients.
  - a. Three thought the depressions were permanent and forty-seven did not feel this way.
  - b. Twenty patients stated that at one time or another they had to explain these marks to other people.
6. With the high-pull headgear fifteen experienced depressions atop the head and thirty-seven did not.
  - a. Only four felt these would be permanent and forty-four did not.
7. Thirty-seven did mind having other people see them wearing the headgear and twenty-seven were not embarrassed by it.
  - a. In the home, nine said they did mind and fifty-three did not.
  - b. & c. Received identical answers of fifty to fourteen about wearing the headgear to school or in other public places.
8. When asked, "Did your feelings about having other people see you wear your headgear limit the time that you wore it", thirty-four said yes and twenty-four said no.
  - a. About the time *per* day, twenty-three yes and twenty-seven no.
  - b. About the time *of* day, twenty-eight yes and twenty-three no.
9. Preference was evenly divided, 23-24, when asked for a choice between high-pull and cervical gear at inception of treatment.
  - a. At end of treatment fifteen preferred the high-pull and nineteen the cervical gear.
10. Preference was influenced by:
  - a. Comfort, twenty-nine yes and twelve no.
  - b. Color, three yes and twenty-seven no.
  - c. Appearance, seventeen yes and twenty-one no.
  - d. Reducing length of time of treatment, twelve yes and twenty-three no.
  - e. Straightening teeth effectively, twenty-seven yes and twelve no.
  - f. Ease of putting it on was almost evenly divided, twenty to twenty-two.

From this it can be assumed the patients were most interested in having a good correction obtained, by comfort, and were not overly impressed by the headgear's use to reduce the length of time of treatment. Prior to beginning treatment and during the diagnostic procedures the most commonly asked question is, "How long will I have to wear my appliances?" Consequently, the response to question ten was rather revealing in the appeal of quality rather than of duration of treatment.

11. Why did you wear your headgear?
  - a. Sixty-two replied affirmatively to wanting their malocclusion cor-

rected. Five did not answer. It should be mentioned that during the first examination of a patient the use of the headgear was included as a possible requirement to accomplish the desired results in correction of the malocclusion. The necessity for fullest cooperation, consistency in its daily use, and a minimum wearing, fourteen hours in a twenty-four hour period, was told to the patient and parent at this time prior to the beginning of treatment.

- b. Thirty-six said they wore it because their orthodontist asked them to do so and five replied negatively.
  - c. Your parents insisted, yielded a yes answer in seventeen cases and a no in twenty-four cases.
  - d. Five wore it because friends did, and thirty-five replied negatively.
  - e. Under a separate heading for other reasons, one wore it because of a sense of duty, two wanted to be finished quickly and one boy who wore it twenty-four hours a day said his reason was to save money.
12. When asked, "Did you like your headgear?", eighteen said yes and thirty-nine said no, a ratio of greater than 2 to 1. They probably felt that it was something to tolerate.
  13. Sixty-three replied yes and no negative responses were given to the question, "Do you feel that it was worthwhile to have your teeth corrected?" Two boys and two girls gave no response.
  14. The last question was, "What could have been done to give additional incentive to wear your headgear more?" Here the most universal answer was "Nothing". My feeling

is that the patients considered that the instructions given to them before treatment and at the time the headgear was given to them with specific instructions for its use and care were adequate and the responsibility for its effectiveness rested with them. However, these additional statements were made; to stress its importance more, appliances off sooner, up to the patient, be told a few more times. One patient said that the high-pull with high pressure resulted in headaches. Frequent reminders to wear it as instructed should be given during the course of treatment.

Occasionally a patient would state that the headgear had come off during the sleeping hours, or he had removed it without awakening. Invariably, in a situation of this description it was determined that the patient had not worn the headgear that afternoon or evening. The headgear would be placed at the time of retiring and the patient would not be entirely comfortable, even though sleep had been attained, and its removal occurred without awareness or awakening.

#### LIMITATIONS OF THE STUDY

The sixty-seven cases in this study are all patients of one orthodontic office, and are cases where treatment termination and retention were accomplished within a twelve month period. Consequently, they represent a selected population.

The study does not include control subjects, as the study was based solely on headgear usage of recently completed orthodontic patients. There is no control over the psychocurative effect of the use of the headgear since it is included in the treatment of each orthodontic patient in the study. In range of difficulty of correction, there was no control, as the cases were widely

varied in the difficulty of correction.

#### DISCUSSION

Regarding the Attitudes questionnaire, it can be generalized that, in this age group, patients are rather sophisticated and possess a generous quantity of modesty.

The patient's cooperation in use of the headgear in some cases, probably, was less than had been indicated by them. However, it is felt that cooperation was greater when reasonable requests were made as opposed to unreasonable demands.

#### CONCLUSIONS

Reference can now be made to the five hypotheses made at the beginning of this paper, and it can be concluded that:

1. Success in orthodontic treatment and motivation of the patient are directly related, and is supported by a positive correlation of .82.
2. The duration of treatment would be shortened by high level patient motivation, and this is substantially supported by a correlation of .61.
3. There is a low but positive correlation of .29 that psychological factors influence the motivation of the patient for orthodontic treatment.
4. There is some correlation of those who said that they wore the headgear every day with success of the treatment. However, it is felt that evidence of inconsistency led to prolonged duration of treatment. The relation between the daily wearing of the headgear and the success is not readily apparent from the self-report of the patients. Therefore, this study does not support the conclusion that the daily use of the headgear is vital to success of orthodontic

treatment. It would appear that the important factor would be the total number of hours of use during a specified amount of time, such as a week or a month. However, in the observation of the orthodontic patients of the study in the most successful cases, the daily consistency is efficacious and leads one to wonder if the most successful might have reported honestly, and that the less successful overstated their use of the headgear.

5. Unpredictable occurrences, beyond the control of the patient or orthodontist, have been shown to influence the consistency of the use of the headgear.

#### SUMMARY

The correlation of success ranking with the duration of treatment was .41 which shows some degree greater than chance of relationship. From this it could be concluded that the shorter duration of treatment was to some degree related to higher success.

The motivation of the patient, as ranked by the orthodontist, correlated with the shortness of duration of treatment at .61. This correlation accounts for 36% of the variance between means and would indicate a significant degree of relationship between the motivation of the patient and the success of the orthodontic treatment. This degree of correlation would mean that, if performance on one variable were used to predict the other, the prediction of the other would be accurate 80% of the time.

It would be well to establish as early as possible some concept of the patient's motivation. It can be assumed that achievement level, motivation, and scope of the orthodontic problem are readily ascertainable.