

ANALYSIS OF TURKISH CHILDREN'S DENTAL ANXIETY BY VARIOUS PSYCHOLOGICAL TESTS*

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The dentist is interested not only in the total physical condition of his patients, but also in the patient's psychological and emotional state.

The child's fear of the dental office and its connotations has been investigated circumferentially from several vantage points. However, the child's own fantasies and fears regarding dental treatment have been considered by very few authors. How does a child prepare himself for a visit to the dentist? What does he expect?

The graphic visualizations of children have been a valuable tool for the assessment of maturity, intelligence and other psychodevelopmental characteristics. As early as 1885, Cooke published a series on children's drawings describing children's stages of development, and in 1887, Ricci published a more detailed account on projective drawings¹. The Goodenough² "Draw a Man Test" has since attracted many advocates and much emphasis is placed on this method. The technique consists of first measuring maturity and intelligence, and second anticipating or demonstrating graphically, subconscious fears and fantasies². Berman and Laffal³ in their study argue that "the correlation between body type of the subject and of the figure drawings by the child supports the validity of the figure drawing test as a projective device, since they show a relationship between one aspect of the individual and of the figure drawn by him. The findings also support the hypothesis that the figure drawing is in part, a projection of the body image". A study of children's drawings may help in the understanding of individual characteristics, problems and special needs.

Hammer⁴ discusses these criteria thus: "Drawing medium has been found to enhance the projection of the subject's deepest fantasies, wishes and fears on conscious and unconscious levels. The unconscious is based especially in the

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language of graphic symbols. In this way the subject often brings to the surface what he dare not or can not say in words".

Many investigators have discussed the relationship between maternal anxiety and child behavior. In studies by Johnson and Baldwin⁵ and Shoben and Borland⁶, the Taylor Manifest Anxiety Scale⁷ was administered to the mothers of child patients. These studies provided data indicating that maternal anxiety is related to children's cooperative behavior in the dental setting. However, the study of Wright and Alpern⁸ indicated that this relationship is primarily of significance with children three to four years of age.

The purpose of the investigation reported here is to study children's reactions to dental treatment in different environments, specifically as they relate to children's anxieties associated with dental care. Various psychological tests were conducted to record these anxieties.

Material and Method

Seventy-five children with and without prior dental experience were the subjects for this study. There were 36 girls and 39 boys who ranged in age from 8 years to 11 years.

The children were divided into three groups :

1. *Clinical group* : children of dental clinic patients were chosen randomly (25 children).
2. *Letter group* : a descriptive letter (see Form Letter) was sent to the parents of children, whose addresses had been provided by their school administrations, explaining the purpose and procedure of the study. Appointments were scheduled for each child without contacting the children (25 children).

Form Letter

Dear Parent,

An investigation of children's behavior toward dental treatment has been planned by our department. An oral examination and cleaning will be performed on the children who participate in this study.

If you agree that your child take part in this study and he / she is between 8 and 11 years of age, please attend the following appointment.

Date of appointment:

Place:

Frankl's Behavior Pattern:

1. *Definitely negative* : Refusal of treatment, overt resistance and hostility, extreme fear, forceful crying, massive withdrawal and/or isolation.
2. *Slightly negative* : Minor negativism or resistance – accessible to treatment technique – minimal to moderate reserve, fear, nervousness or crying.
3. *Slightly positive* : Cautious acceptance of treatment, but with some reluctance, questions or delaying tactics; moderate willingness to comply with dentist at times with reservation, but follows directions.
4. *Definitely positive* : Good rapport with operator, no signs of fear, interest in procedures and appropriate verbal contact.

3. School group : 25 children were tested in the classroom environment.

Upon arrival the mothers of the clinical and letter group children were given a questionnaire and a brief history form, in an attempt to learn something about the child's past dental experience and his family environment. The questionnaire was designed to secure the mother's rating of her child's behaviour and reactions, both past and present in the dental or medical situation. The questionnaire included the following:

1. *How would you rate your own anxiety (fear, nervousness) at this moment?*
a) High b) Moderately high c) Moderately low d) Low
2. *Does your child think there is anything wrong with his (her) teeth such as chipped tooth, decayed tooth, gum boil, etc?*
a) Yes b) No
3. *During the past year has your child been in contact with anyone who has had an unpleasant dental experience?*
a) Yes b) No

Each child from the clinical and letter groups was escorted to the operatory by the dentist and seated in a corner where he found a pencil and a sheet of unlined paper. The child was then asked to draw the dentist and himself. After completion (maximum time allowed was 10 minutes) the materials were removed. The child was introduced to the dental chair. The dentist explained the procedures for the visit and performed an oral examination and cleaning. Throughout the procedures an effort was made to obtain good cooperative behavior utilizing the "tell-show-do" technique⁹. Every effort was made to avoid causing the child discomfort. By

use of a behavioral rating scale adapted from the work of Frankl et al¹⁰, the child's behavior was rated at five predetermined phases:

1. Separation from the mother,
2. Initial exposure to dental environmental,
3. Reaction to drawing procedure,
4. Reaction during examination,
5. Reaction after examination.

Children in the school group were tested in a classroom environment. A questionnaire-interview was given to collect information on the child's memories of previous dental and medical experiences. Following this brief conversation the children were asked to draw the dentist and themselves; The papers were collected after completion (maximum time allowed was 10 minutes).

The analysis of the drawings was determined by recording 1. Presence or absence of a smile, 2. Detail in the picture, 3. The child's size compared with dentist's, 4. Drawing of the dentist, 5. Omission of parts of the body, 6. Depicting dental instruments. The presence of a smile, hands, dental instruments and detail represented absence of anxiety, while absence of any of these characteristics, a larger size of the dentist and extinction of the dentist represented the presence of anxiety. The level of anxiety of each drawing is the sum of the six criteria and varies from 0 to 6, the highest possible score representing complete freedom from anxiety.

The relationship of the questionnaire items to the children's behavior scores was determined by Student's *t* test. An analysis was performed for each group as well as for entire age groups. These ratings of anxiety and cooperativeness were scored by independent raters. The raters were not informed of the group membership of the children being rated.

Results

The distribution of the 75 children by age and sex is shown in Table I.

The analysis of the scores by Frankl's Behavior Pattern indicated that the difference in cooperative behavior between boys and girls was statistically significant. The girls in the clinical and letter groups were found to be more cooperative than the boys in the same groups ($p < 0.001$).

The analysis readily demonstrates the cross-validation of the relationship between maternal anxiety and children's cooperative behavior. The child's negative behavior was significantly related to high maternal anxiety, the child's belief in the existence of a dental problem and the child's prior contact with someone who had had an unpleasant dental experience.

The results of the clinical group demonstrated a highly significant relationship between the level of anxiety in the mothers as measured by their scores on the

TABLE I
Distribution of Subjects by Age and Sex

Ages (yrs)	Clinical group		Letter group		School group		Total
	Boys	Girls	Boys	Girls	Boys	Girls	
8	3	3	3	3	3	3	18
9	4	3	3	3	4	3	20
10	3	3	4	3	3	3	19
11	3	3	3	3	3	3	18
Total	13	12	13	12	13	12	75

questionnaire and the behavior of their children as recorded on the behavior rating scale. Children of mothers with high anxiety scores demonstrated significantly more negative behavior than did children of mothers with low anxiety scores ($p < 0.01$).

The preappointment letter enhanced the cooperative behavior of the children in the letter group. The behavior of those in this group, tended to be more positive than those of the clinical group. However, this difference did not prove to be statistically significant.

The distribution of the children by the characteristics of their drawings and by group is shown in Table II.

TABLE II
Distribution of Subjects by Drawing Characteristics

Drawing characteristics	Clinical group		Letter group		School group	
	Boys	Girls	Boys	Girls	Boys	Girls
1. Presence of smile	2	5	2	3	2	7
2. Detail	1	2	1	1	—	3
3. Child's size	8	4	5	2	8	6
4. Dentist	13	12	13	12	13	12
5. Omission of body part	1	5	3	3	7	2
6. Dental instruments	5	4	3	1	4	2

The children whose anxiety was high and who did not want to be separated from their mothers drew pictures that told the story thus: the huge figure of the dentist over the entire page and another figure of fairly small dimensions representing themselves (Figure 1). Many of these drawings had no arms or legs, arms with no hands or legs with no feet. The child's mouth was drawn with the corner down, the dentist's with a smile (Figures 2 and 3).

Figure 1
Drawing by 8-year-old boy
with high anxiety level
(Clinical group).

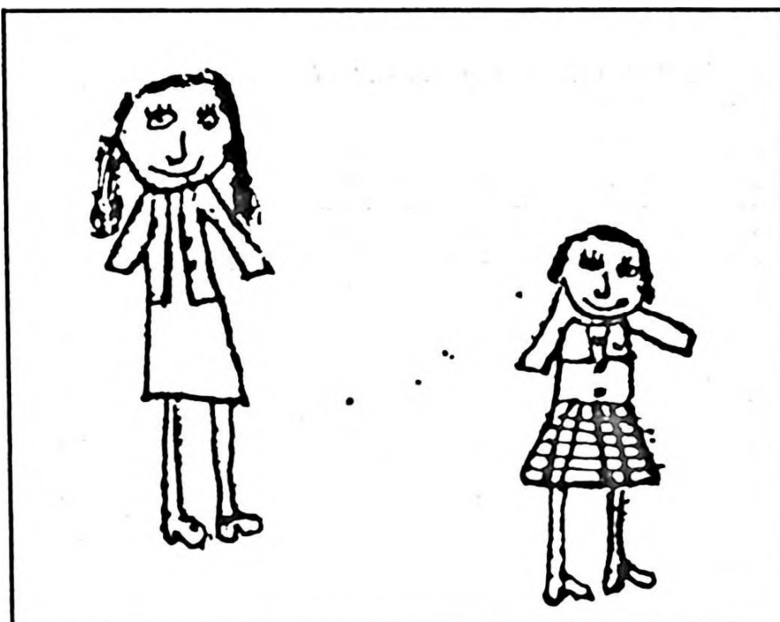
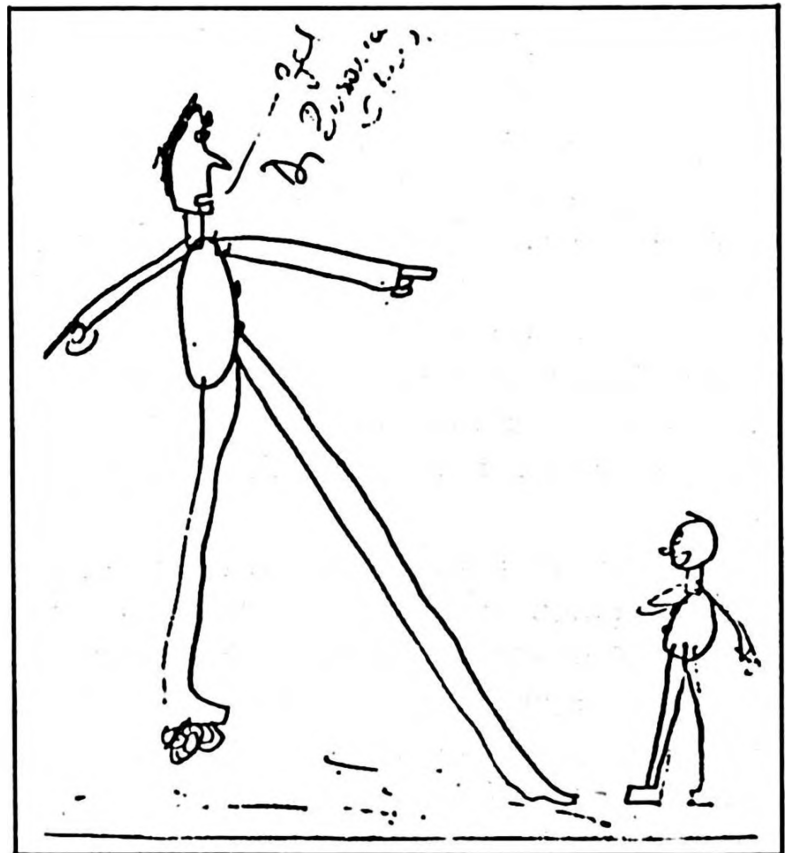


Figure 2
Drawing by 8-year-old girl
with high anxiety level
(School group).

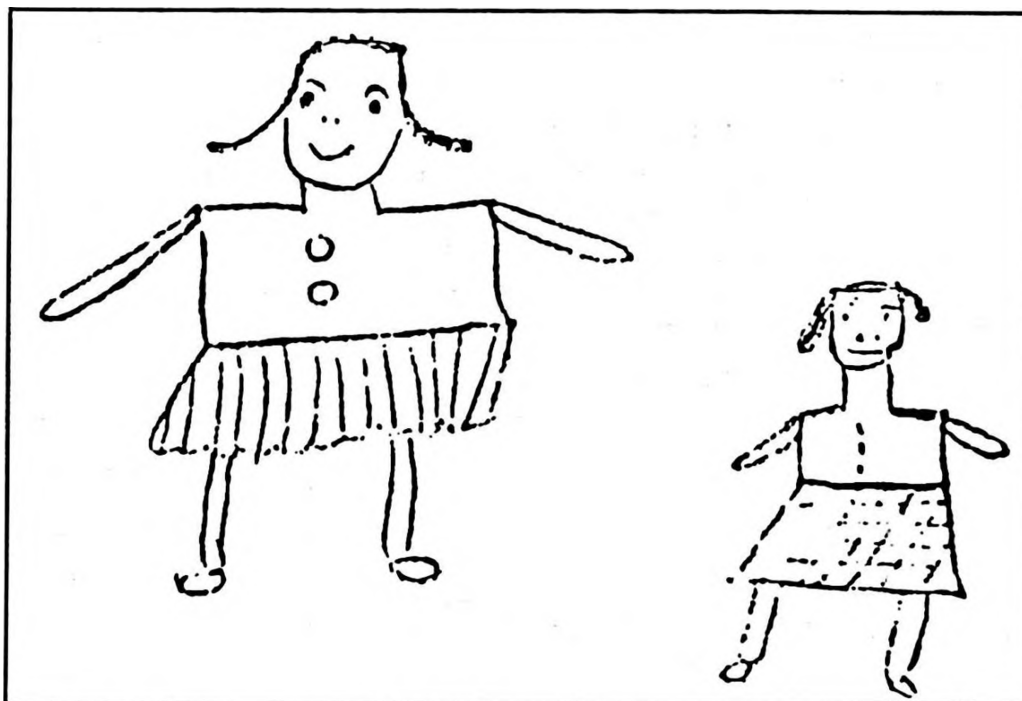
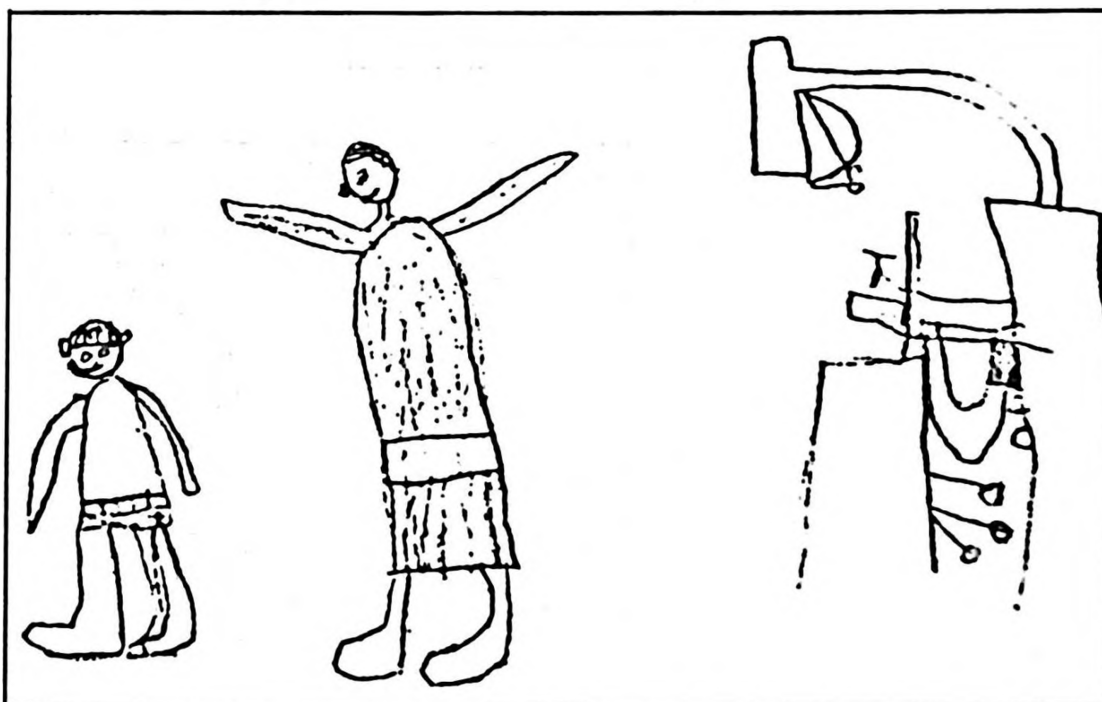


Figure 3

Drawing by 8-year-old girl with high anxiety level (School group).

The children who had previous dental experience drew detailed, well proportioned figures with a large amount of background material. They included such details as eye glasses, dental instruments, wall decorations and flowers in the operatory (Figure 4). However, they revealed their anxiety with the shape of the child's



mouth down at the corners, frowning, and the turned up corners of the other figure's mouth, smiling. They included the pointed or hooked instruments. Their fear was not of the operator, but of what he held in his hands. They omitted parts of the body or underscored them by accent, size or shape (Figure 5). A characteristic omission was that of the arm which was explained "because you may hurt with it" (Figure 6).

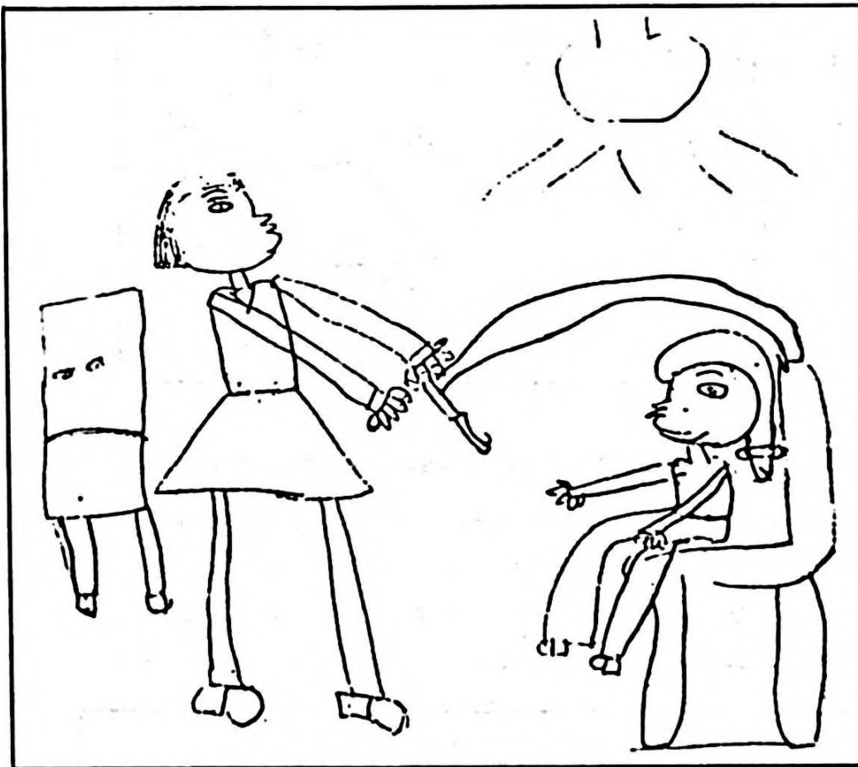


Figure 5

Drawing by 8-year-old girl who had previous dental experience (Clinical group). Low anxiety level.

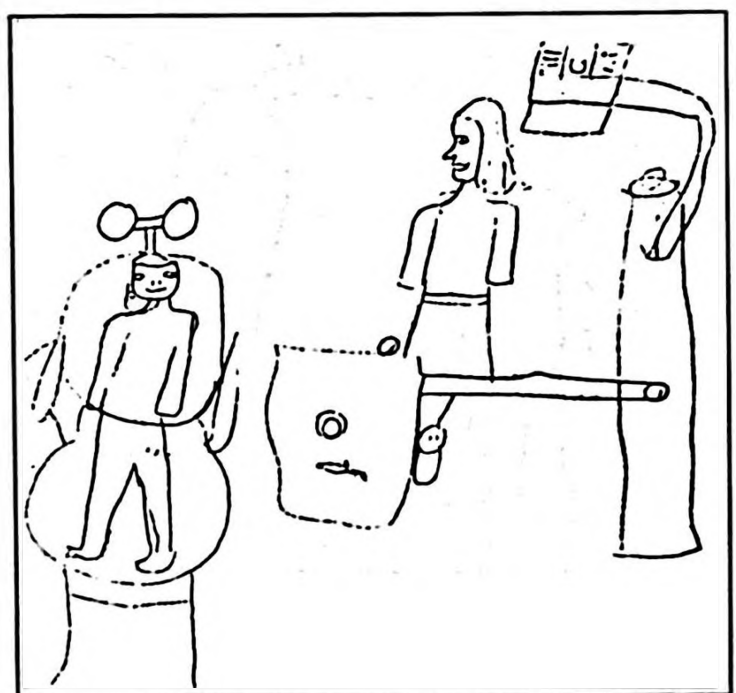


Figure 6

Drawing by 8-year-old boy who had previous dental experience (Letter group). Low anxiety level.

Discussion

The findings of this investigation clearly demonstrate that the behavior of children in the dental situation can be related to the level of manifest anxiety of their mothers. Although there is a difference in age groups, this result of the study supports previous findings which state that there is a significant relationship between the cooperative behavior of children and the anxiety of their mothers^{5,8}. The validity of the mother's responses to the questionnaire may be questioned. Several writers refer to the difficulty of using questionnaires as a determinant of anxiety¹¹. There was no way to evaluate the sincerity of the answers, but an attempt was made to encourage free expression of the mothers' feelings.

In the present study, an attempt was made to investigate the usefulness of the preappointment letter in influencing maternal anxiety and the child's cooperations, and to assess the clinical value of these findings. According to Wright et al¹², the preappointment letter did not significantly influence the cooperative behavior of the children. However, their behavior tended to be more positive than that of the other groups. The findings of this investigation are in agreement with Hoffernan and Azarnoff¹³, who reported that a preappointment contact with the parents had the effect of reducing the anxiety of the children when compared with the other groups. The letter may have helped the mother and child in ways not measured by the study. It may have lowered the child's preappointment anxieties.

According to Frankl et al¹⁰, factors of race, sex and socioeconomic background had no demonstrable effect on the subjects' response to dental care. On the other hand, Shirley¹⁴ stated that anxiety is more frequent in boys. The results of this study support the findings of Shirley¹⁴ and conflict with those of Sarason¹⁵ and Phillips¹⁶ which indicate that girls are more anxious than boys in the dental environment.

Clinical experience has repeatedly verified one basic, primary assumption; a child when directed to draw a person will produce a figure which relates immediately to the impulses, anxieties, conflicts and aspirations characteristic of the artist¹⁷. The comparison of the drawings with the other test results used in this study showed a positive correlation. However, this correlation and the effect of age on drawings was not studied statistically.

The anxiety of children in the dental situation has been reported to be higher than in the classroom situation, but this difference was not found to be statistically significant. In contrast, the results of our investigation showed that the school group was significantly more anxious than the clinical and letter groups. This may be parallel to the classroom anxiety which has been described by other investigators.

Summary

The purpose of this investigation was to study anxiety of children vis-à-vis dental treatment in the dentist's office and in the classroom. Various tests were applied to 75 children who ranged in age from 8 to 11 years. The children were evaluated in three groups: clinical, letter and school groups.

The behavior of the children was rated by Frankl's Behavior Pattern, and the anxiety of the children was rated by using the Goodenough "Draw a Man" test. The relationship between maternal anxiety and child behavior was also studied.

The results of this study indicate that among the three groups the school group was the most anxious and the letter group the least. The boys were more anxious than the girls ($p < 0.001$). Maternal anxiety and previous dental experience influenced the children negatively. The results also demonstrated that dental anxiety can be detected by various tests and can be evaluated statistically.

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