

# Pre-school children with uncooperative behavior in the dental situation

## Some characteristics and background factors

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One hundred and eighty-six generally healthy pre-school children referred to a pedodontic clinic because of uncooperativeness in the dental situation were surveyed with regard to some characteristics and background factors considered of importance as possible origins of the uncooperative behavior. Information was gained from interviews with the referring dentists and the parents, from a developmental test of the child, and from dental records. In spite of a high prevalence of caries, dental treatment before referral was characterized by few restorative measures. The results also showed that the children constituted a heterogeneous group with regard to the variables studied. Further, the referring dentists represented various resources in terms of self-reported knowledge and time for treating this category of children. The data provide a basis for comparisons with a reference group, to be presented in a subsequent study. □ *Dental anxiety; dental fear; interviews; pedodontics*

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The most important reasons for uncooperative behavior by the pre-school child in the dental situation are fear and anxiety, the origin of which has been related to both the child itself (1-4) and to the parents (1, 5-8). The behavioral expressions of fear and anxiety may, however, vary considerably, depending not only on the extent to which the child perceives fear and its own resources to cope with it but also on the child's motivation to cope (9). The psychologic interrelations that are established between the child, the parent, and the dentist may therefore play a decisive role for the behavior of the child (7, 9, 10). Accordingly, the dentist's approach also has a great impact; several studies have stressed the importance of proper management of the child and the parent by the dentist (10-14).

The relative importance of the separate factors that have been related to uncooperative behavior of the child is not clear. The aim of the present investigation was to survey relevant characteristics and background factors of pre-school children

referred to a pedodontic clinic owing to uncooperative behavior. A description of the child, its medical and dental history, socio-demographic data, and family attitudes to dentistry were assessed. The referring dentist's opinion about the specific uncooperative child and his own resources for handling uncooperative children in general were also studied. In a subsequent paper these data will be used for comparisons with a reference group of children.

### *Background data, 1983*

The Swedish Public Dental Health Service provides free regular dental care for everyone between the ages of 3 and 19. About 90% of the population are estimated to use this system. The organization also includes several specialist pedodontic clinics to which children can be referred when the general practitioner judges that technical and/or psychologic problems are beyond his skills. The Eastman Dental Institute is one such clinic, situated in the city of Stockholm and having

a catchment area of about 160,000 children and teenagers. At the time of this study the area comprised 54 clinics with pre-school dental care. About half of them were situated in the suburbs. Of a total of 261 general practitioners, 18% worked exclusively with children's dentistry and 3% only with adults. Seventy-four per cent of the dentists were women. Demographically, the area varied in geographic characteristics and settlements; pure countryside, typical suburbs, city-like and inner-city areas, and residential districts were represented.

## Materials and methods

In 1982–84 all pre-school children aged 4–6 years (about 150/year) referred to the Eastman Dental Institute because of uncooperativeness in the dental situation were considered potential participants in the study. The lower age limit of 4 years was chosen because this is when most generally healthy children have reached treatable age (2). The aim was to study normal, generally healthy, Swedish children. Children with mental retardation, severe physical handicaps, or severe chronic diseases and those who could not communicate in Swedish to the normal extent for 4- to 6-years-olds were not included.

One hundred and ninety-six children met these criteria. They were referred from 115 dentists in the catchment area. The parents and children were invited to participate, and written information about the aims of the study was sent to the parents. Five did not enter the study because the parents had arranged treatment elsewhere; three did not turn up for the appointment, and two did not want to participate. The final material comprised 186 children, evenly distributed by age and sex. Data were obtained by interviews, a developmental screening test of each child, and from dental records. All interviews and the test were performed by one of the authors (B. Ljungkvist), who is a qualified psychologist as well as a dentist. Information was collected in accordance with the following scheme.

### Referring dentist

Soon after receipt of the referral, a telephone interview was held with the referring dentist, covering the information indicated in Table 1. The level of dental anxiety of the child was assessed on a five-point scale.

Table 1. List of variables included in the interviews with the referring dentist and the parent and information obtained from the dental records

Interview with referring dentist	
Personal data	
Years in dental practice	
Opinions about the proper time and knowledge for handling children with uncooperative behavior	
Number of children referred/year	
Child	
Level of dental anxiety	
Whether a change of dentist had been tried	
Whether premedication had been tried	
Main reason for uncooperative behavior in the dental situation	
Interview with parent	
Personal data	
Age	
Citizenship	
Socioeconomic status	
Civil status	
Own dental anxiety	
Child	
Location of spending daytime	
Number of siblings	
Physical traumatic experiences, hospital stays	
General anxiety	
Bedwetting, stuttering	
Main reason for uncooperative behavior in the dental situation	
Dental records	
Caries data	
Number of dental visits with behavioral problems before referral	
Number of provocations (= a measure that might induce pain such as injection, drilling or extraction)	
Number of provocative occasions before referral	
The treatment point at which the child refused to cooperate at the last visit before referral	

ranging from not anxious to extremely anxious.

### *Parent/child*

The first visit to the pedodontic clinic included an interview with the parent and a developmental screening test of the child. This was done in a neutral setting outside the dental office and on this occasion the child and parent did not meet the pedodontist who was going to treat the child. The interview covered various background factors of the child and its family (see Table 1). The socioeconomic standing of the family was included because it was considered of interest to see whether any group was over-represented; use was made of the Swedish socioeconomic classification (15). The parents' own dental anxiety was graded as yes or no from the questions: 'Do you feel upset about going to your dentist?' and 'Do you need pressure to be able to visit your dentist?' A yes score required affirmative to both questions. The interviewed parent estimated the dental anxiety of the other parent from the same questions. General anxiety of the child concerned the child's behavior in daily life situations other than the dental situation and was assessed from a question to the parent: 'Do you consider your child to be generally anxious?' The following elucidation was given: 'A generally anxious child tends to be fearful and afraid of new things and new situations' (16). Scoring was dichotomized into yes or no.

### *Test*

The Denver Developmental Screening Test (DDST) was administered to the child after the interview with the parent. The test is a standardized developmental screening method to aid in the early detection of delayed development in young children (17). It is relatively simple to administer and requires limited equipment. The test consists of a series of tasks in four subsections: personal-social, fine-motor adaptive, gross-motor adaptive, and language. The child's developmental progress is classified as normal, questionable, or delayed. Our aim

with this test was to try to determine whether pre-school children with uncooperative behavior in the dental situation are over-represented with regard to developmental retardation.

### *Dental records*

Data obtained from the dental records are listed in Table 1. The number of dental visits with behavioral problems before referral was calculated as the number of visits from the first time the child expressed behavioral problems according to the notes and until the time of referral. A provocative measure in the dental situation was a measure that might have induced pain, such as injection, drilling, or extraction. A provocative occasion was an occasion on which one or more provocative measures had been used.

### *Statistical methods*

The chi-square method was used for testing differences between proportions of frequencies. Differences at the 5% level of probability were considered statistically significant.

## Results

### *Interview with referring dentist*

*Personal data.* The 115 dentists had practiced for an average of 12 years. Seventy-five per cent spent more than half of their working time on child dentistry. Twenty-five per cent considered that the time available for children with behavioral problems was insufficient, and 65% stated that their knowledge of psychology relating to these problems was inadequate. The mean number of children referred per year was three (range, 2-8).

*Child data.* The level of dental anxiety of the children is given in Table 2. The main reasons for uncooperative behavior in the dental situation according to the referring dentist and the parent are shown in Table 3.

Agreement on the main reason for uncooperative behavior was found in 13% of the

Table 2. Level of dental anxiety of the children according to the referring dentist at the time of referral, in percentage of the children

Extremely anxious	17
Anxious	30
Reasonably anxious	34
Somewhat anxious	11
Not anxious	7
Not answered	1
Total (n=186)	100

children. A change of dentist to try to solve the behavioral problems of the child had been tried in 10 children. Premedication with benzodiazepines had been used in 12 children, in 10 of them only once.

#### Interview with parent

*Sociodemographic data.* The mothers' median age was 33 years, and the fathers' 36 years. Sixteen per cent (either mother or father) were foreigners, compared with 11.5% in the catchment area (18, 19). The proportion of workers was 37%, civil servants or salaried employees at low or medium level, 39%; senior civil servants or owners of business enterprises, 22%; and students, 2%. The corresponding figures for

families with 4- to 6-year-old children in Stockholm County were 33%, 37%, 28%, and 2%, respectively.

Sixty-eight per cent of the children lived with both their natural parents, 25% lived with one parent only, 5% lived with one natural parent and a stepparent, and 2% were adopted. In the area as a whole, 13% of the children lived with one parent only. Twenty-seven per cent of the parents had been divorced during the life of the child. Dental anxiety was recorded for 41% of the mothers and 23% of the fathers. For 55% one or both parents in the family expressed dental anxiety.

*Specific child data.* Fifty-four per cent of the children attended public daycare centers, 36% were at home, and the rest either stayed with a childminder or had a private nurse. Twenty-six per cent had no sibling, 47% had one, and the rest two or more.

Thirty-one per cent of the children had had trauma against the mouth and/or the teeth. Sixteen per cent had experienced suturing in connection with injuries, and 37% had stayed at a hospital at least one night after the age of 1 year.

According to the parent, 25% of the children were generally anxious. Present bed-wetting was recorded for 18%; 10% had stuttered or were stuttering.

Table 3. Main reasons for uncooperative behavior of the child according to the referring dentist and the parent, in percentage of the children

	Referring dentist	Parent
Previous dental treatment	6	54
Emergency need of dental care	3	1
Previous illness and/or physical traumatic injuries	3	10
Attitudes in the family/upbringing	44	7
Socioeconomic factors	2	1
Personality of the child, such as general anxiousness, stubbornness, mulishness	21	15
Immaturity of the child	15	1
Don't know	5	10
No answer	1	1
Total (n=186)	100	100

Table 4. Caries prevalence correlated with age at time of referral. Mean values and standard deviations (SD)

	4 years		5 years		6 years	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
deft	7.58	2.74	7.30	2.75	8.56	3.09
defs	10.35	4.80	10.97	5.50	12.29	6.96
ds	9.32	4.60	9.30	5.10	8.97	5.40
defs appr.	1.98	2.58	3.24	2.95	4.92	3.24

**Test**

According to the DDST, 47% of the children were classified as normal, 17% as questionable, and 23% as delayed. Fourteen per cent refused to cooperate on the test. The three scores of the DDST were cross-tabulated against the presence or absence of general anxiety and against the scores of dental anxiety. No statistically significant correlations were found.

**Dental records**

The prevalence of caries among the children is given in Table 4. According to epidemiologic data for Stockholm County, the mean number of defs in 4-, 5-, and 6-year-olds in 1985 was 0.73, 1.4, and 2.1, respectively.

The number of dental visits with behavioral problems before referral and the number of provocations and provocative occasions before referral are shown in a box plot diagram (20) in Fig. 1. The reason for the first dental visit was routine examination for 78% of the children and trauma to the teeth or toothache for 16%. The type and distribution of provocative measures before referral are illustrated in Fig. 2. Thirteen per cent of the children had had one or more teeth extracted owing to caries.

Twenty-one per cent of the children had not been exposed to any provocative measure before referral. The two groups—the unprovoked and those who had been provoked in the dental situation—were cross-tabulated against the three scores of the DDST, against presence or absence of general anxiety, and against the scores of dental anxiety. No statistically significant corre-

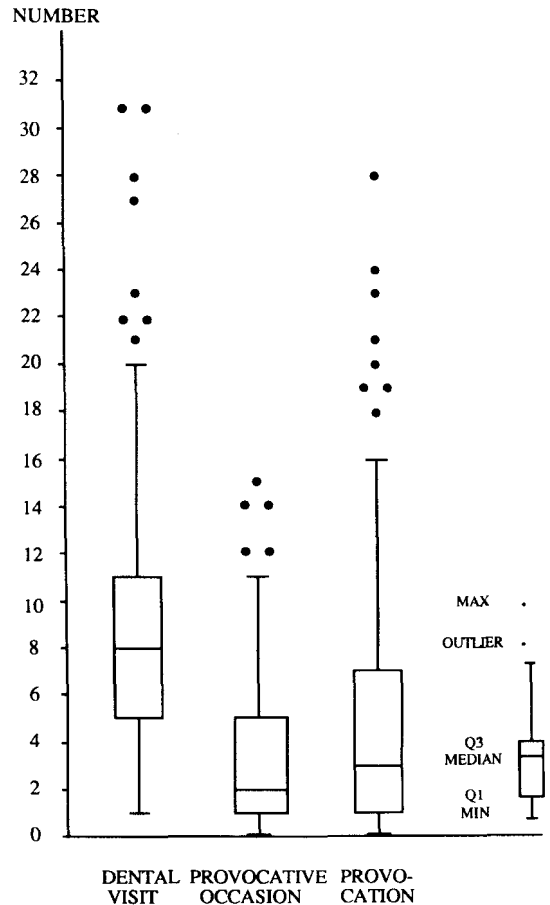


Fig. 1. Box plot diagram illustrating the distribution of number of dental visits, provocative occasions, and provocations (= a measure that might have induced pain, such as injection, drilling or extraction) of the children before referral to the pedodontist. The diagram is designed as follows: min to Q1 = 1st quartile; Q1 to median = 2nd quartile; median to Q3 = 3rd quartile; Q3 to max = 4th quartile. Thus, 50% of the children ( $n = 186$ ) are within the box (Q3-Q1). Observations on more than 1.5 of the distance Q3-Q1 from Q3 are defined as outliers and are represented by dots.



half of the children were scored as questionable or delayed or as refusing to cooperate on the test. These children could not be positively correlated to any particular score of general or dental anxiety. Before any conclusions can be drawn, the DDST must be performed on a reference group of children cooperating in the dental situation.

The tendency to be apprehensive and generally anxious has been positively correlated to dental anxiety in adults (23), and it was therefore thought of interest to try to assess the prevalence of general anxiety of the children in our study. In a recent report (24) the prevalence of general anxiety in a random sample of pre-school children from several small and large cities in Sweden was around 40%. Although that study design differed from ours, making direct comparisons uncertain, it points to the suggestion that the uncooperative children in our material did not show any more general anxiety than other Swedish children of the same age. It should also be noted that general anxiety in this age group may represent a developmental stage rather than some stable personality trait. Other variables, such as bedwetting and stuttering, that are connected to anxiety in children showed almost the same prevalence as in the above-mentioned study.

Earlier traumatic experiences have been reported to have an adverse effect on the child's ability to cope with the dental situation (1). Trauma against the teeth had occurred in 31% of the children, which corresponds roughly to what can be expected for these age groups (25). With regard to the prevalence of hospitalizations, the figure seems high, but no epidemiologic data for comparison could be found in the literature.

More than half of the children in our study had one or both parents who expressed dental anxiety, with the possibility of transmitting anxiety and fear to the child. The importance of the modeling effect on the child of family attitudes to dentistry has been stressed in earlier studies (6, 10, 26). Our material—a small, highly selected group of referred children—is similar to that of Shaw (7), who found significantly more dentally anxious mothers of children referred because

of dental anxiety compared with a control group of non-anxious children.

The disparate opinions about the main reason for uncooperative behavior of the child are illustrated in Table 3. According to the parent and the dentist, the most prevalent reasons were previous dental treatment, attitudes in the family/upbringing, and the personality or immaturity of the child. The most striking point is the limited agreement between dentist and parent concerning the individual child, illustrating the complexity of the origins of uncooperativeness of pre-school children. It is not surprising that the dentist treating many hundreds of children each year, among whom only a few do not cooperate, tends to seek the reason for uncooperativeness in factors other than previous dental treatment. For the parent, on the other hand, with an entirely different frame of reference, consisting of his/her own child and maybe a few other children, it may be more natural to make the child's earlier dental treatment the main reason for uncooperativeness. To locate the reason in the personal sphere of responsibility may also have been avoided because that might discredit the role of a good dentist or parent. The finding is important in that, when communicating with the parent of an uncooperative child, it should be realized that the parent is likely to have a different opinion from the dentist about the reason for uncooperativeness of the child.

The most frequently mentioned reason for uncooperativeness of the child was previous dental treatment (more than half of the children according to the parent). One occasion of drilling resulted in subsequent refusal of this procedure by 38% of the children. Although connected with some degree of unpleasantness in itself, the pain arising from the drilling seems to be the most probable cause of uncooperativeness. This indicates that experience of pain is the crucial point for a large group of uncooperative pre-school children. Since this group represents only a small proportion of all children exposed to drilling and pain, there must be something about their ability and/or motivation to tolerate pain that differs from that of other children. With regard to adults it has been

shown (23, 27) that tolerance of dental pain is lower in dentally anxious persons than in those who state that they are not anxious. It seems logical to assume that this correlation is valid also for young children. This assumption is supported by our finding about the stage of treatment at which the children refused to cooperate at the time of referral. Thus from Table 5 it can be seen that apart from the group of children who refused to cooperate at examination, the two major causes of refusal at the time of referral were drilling and injection. These measures have been found to be two of the most fear-eliciting dental stimuli also in adults, since they are expected to induce pain (28–31). Consequently, the pre-school child's fear of pain in the dental situation may lead to several conditioned stimuli, such as sitting in the dental chair or a request to cooperate in an examination with mirror and probe resulting in uncooperative behavior to avoid pain (32). According to Wardle (30), reduction of pain to a minimum should have first priority to prevent dental fear in adults. Our results emphasize that this is equally important in pre-school children.

### Summary

Pre-school children referred to the pedodontist because of uncooperativeness in the dental situation constituted a heterogenous group with regard to the characteristics and background factors studied. These can be summarized as follows:

Twenty-seven per cent of the parents were divorced during the life of the child. Twenty-five per cent of the children lived with only one parent.

Fifty-five per cent of the children had one or both parents who expressed dental anxiety.

About half of the children did not adequately manage a simple developmental test (DDST).

Thirty-seven per cent had at least one experience of hospitalization.

The children had a high prevalence of caries.

Most had been exposed to only a few provocative dental procedures in spite of a

median number of eight visits before referral.

Thirty-eight per cent of those exposed to drilling refused this procedure a second time.

Less than half of the children had experienced local anesthesia.

Twenty-one per cent had not been exposed to any provocative dental procedure before referral.

The parent and the referring dentist agreed on the main reason for uncooperativeness of the individual child in only 13%.

Sixty-five per cent of the referring dentists considered that they had insufficient knowledge to be able to handle this category of children.

The median number of referred children per dentist and year was three.

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