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# Peer Ratings of First-Grade Thumbsuckers

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**PEER RATINGS OF FIRST-GRADE THUMBSUCKERS,**

**A Thesis**

**Presented to the**

**Department of Psychology**

**and the**

**Faculty of the Graduate College**

**University of Nebraska**

**In Partial Fulfillment**

**of the Requirements for the Degree**

**Master of Arts**

**University of Nebraska at Omaha**

**by**

**Keith Martin McPherson**

**May, 1989**

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THESIS ACCEPTANCE

Acceptance for the faculty of the Graduate College,  
University of Nebraska, in partial fulfillment of the  
requirements for the degree Master of Arts, University of  
Nebraska at Omaha.

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## **Abstract**

The purpose of this study was to investigate the social attitudes of school-aged children toward thumbsucking. Behavior during school-aged years contributes to the development of peer perceptions which may influence a child's self-concept and behavior for years to come. The hypothesis of the present experiment is that children who suck their thumbs are perceived less favorably by their peers. Thumb or finger sucking (hereafter referred to as thumbsucking) is a common and often enduring behavior that typically develops in infancy (Klackenberg, 1949). It is considered developmentally appropriate in infancy because sucking is an adaptive behavior infants use to nourish and calm themselves. However, if thumbsucking continues into later childhood or early adolescence it can become a habit independent of its original function, and become associated with unhealthy consequences. However, for most children thumbsucking does not constitute a problem, and by the age of five only 14.6% of children continue to engage in this behavior (Infante, 1976). For those older children (school-aged) in which the habit persists, however, thumbsucking may result in a variety of negative and deleterious consequences. Considerable etiological research has been conducted in an attempt to link thumbsucking to a variety of

concurring developmental problems.

The most salient and widely reported negative consequences associated with thumbsucking have been dental malformations. For example, Lewis (1962) measured the dental growth and development of children for five years beginning in nursery school. His findings, consistent with those of other investigators, suggest that open bite, overjet, closed bite dental malocclusions, atypical root resorption and unbalanced jaw muscles may result as a function of chronic thumbsucking (Berland & Seyler, 1968; Murray & Anderson, 1969; Norton & Gellin, 1968; Rubel, 1986; Traisman & Traisman, 1958).

Developmentally, there has been a wide range of speculation and controversy related to the etiology of thumbsucking. Much of the controversy has focused on early infant needs, related to mothering, attachment, falling asleep (Ozturk & Ozturk, 1977), emotional development (Massler, 1968), and feeding (Spock, 1957). For example, Ribble (1943, 1944) and others have suggested emotional deprivation, (English & Pearson, 1945; Finch, 1960), deprivation of breast feeding, and inadequate mothering as possible causes for the emergence and maintenance of thumbsucking (Ribble, 1943, 1944). It has also been noted that many thumbsuckers simultaneously hold toys, blankets, or their own genitalia (Freud, 1938) or engage in

trichotillomania (hair-pulling) (Altman, Grahns & Friman, 1982), while sucking their thumbs.

The social consequences of thumbsucking beyond infancy have drawn little experimental attention, although researchers have commented on this aspect of the problem. For example, a school-aged child's self-esteem may be affected if he or she is socially derogated by peers due to thumbsucking. Furthermore decreased peer acceptance may increase a child's risk for juvenile delinquency, school failure and drop-out, and sexual disorders in adolescence (Roff, Sells, & Golden, 1972).

Because decreased peer acceptability may affect the future development of the thumbsucking child as well as society at large the present pilot study sought to empirically examine the effect of thumbsucking on peer evaluations of school-aged thumbsucking children. Forty children approximately six to seven years of age viewed pictures of thumbsucking children and responded to 10 questions which included concerns about their emotional well-being, friendliness, attractiveness, and intelligence. Responses to these questions were summed and analyzed using a repeated measures ANOVA, which provided findings on the social desirability and negative social consequences of thumbsucking on school-aged children. The summed data for each 10 question rating was dealt with as a composite score

reflecting the social attractiveness of the child in that particular picture. The results from the experiment revealed that children who suck their thumbs in school are perceived less favorably than those children who do not suck their thumbs. From an applied perspective, this data provides important information about the social consequences of thumbsucking on school-aged children.

## Chapter 1 Introduction

### Definition, Developmental Progression, and Prevalence

Thumbsucking has been defined as "an infantile oral habit that is normal quite early in the child's development but that may persist and cause deformation of supporting bony tissue and abnormal function" (Dorlands's, 1985, pg. 1366), and "an early manipulation of the body, believed to serve substitute erotic gratification and calming purposes generally seen only from birth to early childhood" (Wolman, 1973, pg. 387). Chronic thumbsucking occurs both nocturnally and diurnally (Wright, Schaefer, & Solomons, 1979). Also included in this definition is the sucking of pacifiers (dummies), blankets, or hair (Wright, 1979). However, these latter forms of non-nutritive sucking have not been as strongly linked to dental malformations, sleeping, or feeding problems as thumbsucking. Pacifier usage is usually much easier to terminate, and is typically given up earlier and with less resistance than thumbsucking. Thumbsucking is believed to arise from the rooting and placing reflexes of the newborn, and be an essential infant behavior related to nutritive sucking. However, by the age

of two years, the oral feeding mechanism has undergone structural changes (e.g., emerging teeth, jaw development, etc.) that emphasize the mastication of nutrients, thus supplanting the primitive sucking mechanism. Therefore, persistent thumbsucking at age two to three is considered a non-nutritive related sucking habit.

Various estimates have been reported regarding the incidence of thumbsucking in children above the age of three years. These have ranged from a high of 30% in a 4-year old sample (Klackenberg, 1949), to a low of 1.9% in a 12-year old sample (Baalack & Frisk, 1971), with a decreasing trend in thumbsucking consistently reported with increasingly older samples of children (Infante, 1976; Lapouse & Monk, 1959; Roberts & Baird, 1971). These reports suggest that the habit still exists for many children at an age when its' developmental function is overshadowed by its' unhealthy consequences.

### Theoretical Interpretations

Many etiologies have been proposed for thumbsucking. Psychoanalytic perspectives have focused on the intrapsychic-mechanisms of the child. Freud (1905), for example, wrote that thumbsucking arose due to the underlying infantile sexual needs of the child. This autoerotic

interpretation has been maintained somewhat in the professional literature, but empirical support for it is inconclusive. Another early explanation maintained that thumbsucking was a displaced response to the neonate's unfulfilled sucking drive during feeding (Spock, 1957). Yet another explanation was proposed by Massler (1968). His "instinctive theory," emphasized that thumbsucking was considered normal in infants up to two years, after which time it may be a simple reaction to boredom, fatigue, frustration, deprivation, punishment, or illness. He went on to say that if the problem has not been resolved by age five years, the sucking may be a sign of regression toward infantile behavior. Finally, other researchers (Graber, 1958; Haryett, Hansen, Davidson, & Sandilands; 1967) have proposed that thumbsucking is a simple habit learned and maintained due to conditioning (Lipsett, Kaye, & Bosack, 1966; Palermo 1956).

More recent studies have focused on specific etiological factors. Ozturk and Ozturk (1977), for example, evaluated the effects of multiple variables including feeding, strength of sucking, sex distribution of children, educational level of parents, maternal occupation, parental attitudes toward physical contact with children, maternal-child relationships, and patterns of falling asleep on

thumbsucking. Their findings related the habit more to patterns of falling asleep than to any of the other factors examined. They found thumbsucking highly negatively correlated with opportunities to suck (ie. bottles, pacifiers) and with the presence of rhythmic stimulation while falling asleep. Premature weaning (Massler, 1983) and reduced physical contact between parent and infant (Larsson & Dahlin, 1985) have also emerged as possible antecedents of thumbsucking.

In summary, research to date does not support any specific single etiology for thumbsucking, although aspects of feeding and falling asleep have been identified as potentially important factors. Conversely, the empirical literature is quite precise in identifying the harmful consequences of thumbsucking. Of the many deleterious consequences reported, perhaps dental problems associated with chronic thumbsucking are the most significant and well documented.

#### Thumbsucking and Dental Problems

Massler (1983) reports "there is no doubt that the placement of the thumb against the long axis of the erupting tooth, for a long time with force, may displace the erupting anterior teeth" (pg.113). The type of tooth displacement,



and its resulting dental classification depends on several factors such as age of the child, duration of the habit, power of the suction, which digit(s) is (are) sucked, position of digit(s) in the oral cavity, and the individual dental genetics of the thumbsucker. In a large retrospective study of the incidence and occlusal conditions in thumbsucking children, Baalack and Frisk (1971) found 13.4% of thumbsucking children over the age of twelve years had received orthodontic treatment, with the two most prevalent dental malformities being overbite and overjet. Others (Andrews, 1961; Ripa & Barenie, 1975) identify digital sucking as the probable cause of labial flaring, anterior spacing, protrusion of maxillary anterior teeth, and anterior open bite. Posterior crossbite has also been correlated with thumbsucking (Campbell, 1984), as has atypical root resorption of the maxillary primary central incisors (Rubel, 1986). Fortunately, after cessation of the sucking habit, most of the dental problems associated with thumbsucking correct themselves. This self-corrective process is much more evident and complete when the habit is stopped at a younger age (i.e., 4 or 5 years) (Heering, 1962).

### Oral and Other Problems Associated with Thumbsucking

Other concurring oral problems related to thumbsucking include tongue thrusting or reverse swallowing, a condition in which swallowing is followed by tongue contact with the front teeth which may lead to deformed bones and unbalanced muscles in the jaw (Berland & Seyler, 1968), as well as delayed speech development (Gellin, 1978).

Additional problems attributed to thumbsucking include digital deformities (Cambell, Reid & Price, 1984), lead poisoning in children exposed to lead based paints (Finney & Friman, 1988), and hair pulling which may occur in conjunction with thumbsucking, resulting in alopecia (Friman, Finney & Christopherson, 1984). Indeed there is some evidence to suggest that hairpulling (ie. trichotillomania) and perhaps other problem behaviors that co-vary with thumbsucking are terminated with cessation of the thumbsucking habit (Altman, Grahs, & Friman, 1982; Friman & Houe, 1987).

### Social Problems and Thumbsucking

Of all the consequences associated with thumbsucking perhaps the least investigated are those which are social in nature. In one of the first studies to consider any social

implications of the habit, Cattell (1972) noted that hand-mouthing interfered with children's interactions with their environment. Children who normally responded to their name quickly, required louder and repeated attempts to gain their attention if they were engaged in thumbsucking. In another study, involving 4-year old children in a day-care setting, hand-mouthing was found to preclude responding to questions, interfere with spontaneous speech development, and the use of manipulative materials. Greater inattention to scheduled activities also appeared more prevalent among these thumbsucking children (Doke & Epstein, 1975). Unattractive dental malformations caused by prolonged sucking may also lead to social problems. Other related difficulties that may result from thumbsucking include parental embarrassment, which sometimes results when children continue to cling to favorite toys and blankets into later childhood (Newson & Newson, 1968). Parents may ridicule or abuse the child in an attempt to stop the habit, although it has been proposed that this could cause the child to feel more insecure, unloved, and congruently more dependent on the habit (Cerny, 1981). Other studies have reported the habit is "usually considered offensive aesthetically" (Azrin, Nunn, & Frantz-Renshaw, 1980), "shameful" (Lewis, 1962) and "socially unacceptable" (Nwachukwu, 1980). In summary, adults appear

to assign low social desirability to thumbsucking children. The habit also may be judged unfavorably by other children (peers of the thumbsucker). The combination of nonacceptance by adults and peers could lead to serious social problems for children with the habit. Therefore, peer acceptance and social desirability or attractiveness should be an important area to study in order to assess the social effects of thumbsucking.

Research in the area of peer acceptance suggests that children who are not accepted by their peers are more likely to be poor academic achievers (Bonney, 1971) and to experience learning difficulties (Amidon & Hoffman, 1965) than children who are accepted by their peers. The assignment of low peer status may also influence interpretations of subsequent behaviors, thus maintaining or even deepening peer rejection (Hymel, 1986), even if the child's deviant behavior improves. In essence, once a child has been identified as a low status peer, that reputation will feed the biases of other children who continue to assign poor peer status to the target child regardless of current behavior. Therefore, if thumbsucking results in low peer acceptance, significant social problems may result.

Along with peer acceptance, peer interactions also may be an area where the detrimental effects of thumbsucking emerge. Piaget noted that peer interaction is a critical and essential determinant in the development of negotiation skills, cooperation, and the understanding of the social rules of compromise and reciprocity (Rubin & Beirness, 1983). Participation with peers is the most direct source of skill acquisition, resulting in more frequent use of coordinated peer-directed behavior (Mueller & Brenner, 1977). Therefore, a thumbsucking child that is assigned a low peer acceptance status may also suffer lower skill acquisition due to decreased peer participation. Because these social factors are critical to child development, and thumbsucking may directly interfere with them, eliminating thumbsucking should result in fewer of these problems and contribute to child development.

### Thumbsucking Treatments

Due to the wide range of beliefs concerning the etiology of thumbsucking, many possible treatments have been proposed. The most effective dental procedure for stopping the habit is the palatal crib. This is an appliance which is secured to the roof of the mouth and may or may not have small protruding spurs on it. A study by

Haryett and Hansen (1970) measured the effectiveness of the crib with and without spurs, as well as the optimum duration for leaving the appliance in the mouth. Their results suggest that the crib without the spurs was just as effective as the crib with the spurs, with the optimal duration of treatment being 10 months. Other studies report the duration for wearing the appliance last from six months to a year (Campbell, 1984). Critics of the dental treatment claim the devices are unesthetic or painful (Lichstein & Kachmarik, 1980), require too long to eliminate the problem, and can cause emotional problems and difficulties with eating and speech (Azrin et al., 1980).

The majority of treatment literature concerning thumbsucking centers on behavior management. "Reminder devices" such as thumb-guards, elbow splints, mittens, and bitter-tasting medicines have all been used. Van Houten and Rolider (1984) evaluated a treatment package consisting of response prevention (e.g., gloves, mittens, cotton, and bandages) and fading to control nocturnal thumbsucking. The five boys and four girls in this study all discontinued night-time sucking and the researchers suggested the treatment should be effective for diurnal sucking. Aversive taste treatment has proven very successful (Friman, Barone, & Christophersen, 1986). In a study of seven chronic

thumbsucking boys and girls, ranging in age from three to twelve years old, the application of an unpleasant tasting substance was applied to the thumb or finger contingently upon occurrences of sucking. Fading procedures to eliminate the application of the substance were used after sucking was not observed for over 10 consecutive days. All seven children stopped sucking within one to three days after the first application of the substance.

Other behavioral interventions have yielded mixed results. For example, the reading of bedtime stories contingent upon cessation of sucking was found to be effective by Knight and McKenzie (1974) with three girls ages three, six, and eight. However, in a similar study Kauffman and Scranton (1974), reported only a short-term elimination of the habit. Thumbsucking re-appeared after treatment was discontinued. In a similar procedure by Stumphauzer (1973), three children were treated successfully for thumbsucking by removing television cartoons when thumbsucking occurred. But problems were encountered in the maintenance of the non-sucking behavior.

Classroom attempts at controlling thumbsucking have achieved mixed results. Nwachukwu's (1980) combination of such techniques as nonverbal reinforcement, cognitive technique, and aversive stimulus proved successful in

eliminating a fourth grade girl's habit. However, Ross (1974) found the use of reinforcement alone was not enough to maintain a 10 year old boy's cessation of sucking in school.

Other behavioral procedures used to treat thumbsucking have included differential reinforcement of other behaviors (DRO), habit reversal, and oral overcorrection. DRO procedures are generally effective in suppressing thumbsucking, but maintenance of treatment effects is often a problem (Kauffman & Scranton, 1974; Lichstein & Kachmarik, 1980). Some interventions have resulted in an increased number of behavioral problems. For example, Christensen and Sanders (1987), using habit reversal and DRO, reported significant increases in oppositional behaviors. Doke and Epstein (1975) reported similar results using oral overcorrection (contingent toothbrushing with an oral antiseptic). Habit reversal may be the most effective treatment. It was reported to be successful in eliminating 95% of the sucking in 32 subjects in a study where treatment lasted just one week, (Azrin, Nunn, and Frantz-Renshaw (1980).

Less conventional methods for treating thumbsucking include "reframing" and hypnosis. Rinchuse & Rinchuse, (1986) used a symptom prescription treatment whereby the



therapist challenged the child to individually suck all their fingers for the same length of time each day, and write down each time they suck their fingers. It was reported that 11 children were successfully treated using this procedure. Tilton (1980) reported a case study where hypnotic treatment was successful in stopping the thumbsucking of an eight-year old boy.

In conclusion, thumbsucking occurs across many settings and is a concern to a cross section of professionals including psychologists, dentists, and pediatricians. The existing literature does not allow us to conclude that any one theory is sufficient to account for the etiology of thumbsucking. Nor is any one approach clearly identified as the treatment of choice for this problem. In addition, our understanding of the social issues surrounding thumbsucking and their effects on future development of the child is incomplete.

The purpose of this pilot study was to investigate the social attitudes of school-aged children toward thumbsucking. Behavior during school-aged years contributes to the development of peer perceptions which may influence a child's self-concept and behavior for years to come. Behaviors or personal characteristics that seem obviously deviant to children, such as handicaps and obesity (Lerner

and Shroeder, 1971), or possibly thumbsucking, may result in unfavorable evaluations even prior to personal interaction. This may result in decreased peer interactions which may in turn have harmful effects on child development. Existing research dealing with the social consequences of thumbsucking is sparse, inconclusive, and often based on adult responses to thumbsucking. Childhood peers represent another group for whom thumbsucking represents a relevant social dimension by which children are judged. Therefore, it is important to investigate the social implications thumbsucking has upon judgement of the peer group in order to further understand the consequences of this behavior. The purpose in the present study, determining peer perceptions of thumbsuckers in first-grade children, was done using questions concerned with friendships, intelligence and other apposite social issues in conjunction with photographs of a child sucking and not sucking his or her thumb. Combined, these questions were believed to yeild an overall score of social attractiveness of the stimulus slide. It is hypothesized that children who suck their thumbs at the first-grade level may be perceived by peers in a less favorable way than non-suckers.

## Chapter 2

### Method

#### Setting

This pilot study was conducted in first-grade classrooms at two public elementary schools in Omaha, Nebraska. The classrooms were approximately 10m x 10m, and contained desks for approximately 20 students. Each room also contained a slide screen (for slides) that was easily viewable by all student-raters.

#### Participants

Forty first-grade students, 20 boys and 20 girls, participated in the study. The participants ranged in age from six to eight years of age ( $M = 7$  years) and were enrolled in regular classrooms. The 40 participants that made up the subject population came from four different classrooms located in two separate schools. First-grade students were chosen because this was the first formal year of primary education and subsequent group interaction. School and the classroom are likely to be the child's first structured non-home related setting where the child is continuously subjected to the perceptions of his/her peers. First-graders are also more likely to be exposed to a

thumbsucking peer. Parental consent was obtained for all participants.

### Procedure

All participants were seated at desks facing the front of the classroom. They were read a brief description of the study (see appendix A), followed by four practice questions and answers (see appendix B), in a format identical to that subsequently used for actual data collection. Questions about the study were answered at this time. The presentation of the slides was divided into two sessions. In the first session the classrooms were shown a boy thumbsucking, and a girl not thumbsucking. The second session was approximately seven days later, and consisted of a boy not thumbsucking and a girl thumbsucking. Therefore, each classroom of first-graders was shown a total of four slides, one at a time, for approximately 10 to 15 minutes each. The order of the slides was counterbalanced between the two sessions to control for any pose sequencing effects. After viewing each slide, students were asked to answer a series of 10 questions (see appendix C) and record their responses on the answer sheet provided.

### Stimulus Materials

There were two slides of a boy and girl approximately seven years of age. One slide was a thumbsucking pose and the other was a non-thumbsucking pose. The slides portrayed only the face, neck, and shoulders of each child, thereby eliminating potentially biasing cues such as height, weight, and posture (Smith, 1985). The children were photographed against a black background to eliminate any other distracting features and were given no specific instructions other than to suck or not suck their thumb. All the children photographed had been, or still were, genuine thumbsuckers, and written parental consent and verbal child consent was obtained prior to taking any pictures.

### Questions

After viewing each slide the subjects (raters) responded to 10 questions concerning social and physical features relating to the child in the slide. For each question there were three possible answers arranged in Likert scale fashion (see appendix C). The subjects were told to choose the answer they felt best fit each question with regard to the picture presented. The 10 questions responded to by the students are listed below.

1. How much do you think you would want this person in your classroom?
2. How much do you think you would want to sit next to this person at school?
3. How smart do you think this person is?
4. How much do you think you would want this person as your friend?
5. How much do you think you would want this person to live next door to you?
6. How fun do you think this person is?
7. How happy do you think this person is?
8. How much do you think you would want to play with this person?
9. How much do you think you would like this person?
10. How pretty do you think this person is?

#### Dependent Measure

The dependent measure of this pilot study was the cumulative score of the 10 questions answered by each student rater for each of the four slides presented. The possible responses for each of the individual questions were arranged in a three-point Likert format. Positive responses (e.g., very fun, like a lot) were scored as three, neutral responses (e.g., sort of fun, like a little) were scored as

two, and negative responses (e.g., not fun, do not like) were scored as one. The four 10-question ratings given by each student for each individual slide were summed, yielding a cumulative or composite score of overall social attractiveness for that particular person and pose. Therefore the final analysis was computed using the four composite scores for each of the four slides, for each of the 40 raters.

Since this was a pilot study in the area of the social relevance of thumbsucking in school-aged children the scores assigned by the raters to the stimulus slides were summed to get a composite score. Future research in this area may require the analysis of individual questions comprising the composite score of social attractiveness.

### Chapter 3

#### Results

The overall social attractiveness of thumbsucking in first grade boys and girls was the focus of the analysis. This dependent measure was evaluated using 2 X 2 X 2 repeated measures ANOVA, with sex of student raters as the between subjects variable, and pose of the slide (sucking, non-sucking), and sex of child in the slide as the within subjects variables. Individual and overall mean composite scores of social attractiveness for each of the slides are presented in Tables I and II respectively.

Results of the ANOVA indicate two significant main effects, and two significant interactions. There were significant main effects for the between subjects variable of the sex of the student rater ( $F(1,38) = 4.30, p < .0449$ ), and the within subjects' effect pose of the child in the slide ( $F(1,38) = 32.91, p < .0001$ ). The composite scores given to the different sexes of the child in the slides were not significant ( $F(1,38) = 2.89, p > .0971$ ). The ANOVA also revealed a significant three-way interaction and one significant two-way interaction. The interaction, sex of the child in slide X pose of the child in slide X sex of rater, was significant ( $F(1,38) = 4.25, p < .0461$ ). The



interaction between sex of child in slide X sex of the student rater, ( $F(1,38) = 28.06, p < .0001$ ) was also significant. The remaining two-way interactions were not significant ( $F(1,38) = 1.32, p > 0.2584, F(1,38) = 2.04, p > 0.1611$ ). The complete summary table for the repeated measures analysis of variance is presented in Table IV.

A simple main effects analysis was done on the significant interaction between the sex of rater X sex of slide factors. Each of the four analyses were significant at the  $p < .05$  level, and the results are presented in Table V.

TABLE I

Individual Mean Composite Scores  
of Social Attractiveness

SLIDE	BOY RATER		GIRL RATER		COMBINED	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Boy Sucking	17.00	6.28	17.70	5.01	17.35	5.65
Boy Not Sucking	22.65	6.92	17.60	4.76	20.13	5.84
Girl Sucking	14.85	5.69	19.65	4.77	17.25	5.23
Girl Not Sucking	19.25	6.06	26.45	3.06	22.85	9.12

**TABLE II**

Overall Mean Composite Scores of  
Social Attractiveness across the  
Three factors

Overall Mean Composite Score for the Factor Sex of Student  
Rater

BOY RATER 18.44

GIRL RATER 20.35

Overall Mean Composite Score for the Factor Pose of Slide

SUCKING 17.30

NOT SUCKING 21.48

Overall Mean Composite Score for the Factor Sex of Child in  
Slide

BOY SLIDE 18.74

GIRL SLIDE 20.35

TABLE III

Difference Between the Mean Composite Scores by  
the Sex of the Rater, Pose, and Sex of the Slide

Difference between the non-thumbsucking and thumbsucking pose by the sex of the rater.

Sex of Slide	Boy Rater	Girl Rater
Boy	5.65	-0.1
Girl	4.4	6.8

Difference between the same poses of the boy and girl slides by the boy and girl raters.

Pose of Slide	Boy Rater	Girl Rater
Thumbsucking	2.15	-1.95
Not Thumbsucking	3.4	-8.85

Difference between the same pose and same sex of the slides between the boy and girl raters.

Sex & Pose	Score
Boy Thumbsucking	-0.7
Boy Not Thumbsucking	5.50
Girl Thumbsucking	-4.8
Girl Not Thumbsucking	-7.2

**TABLE IV**Summary Table

## Repeated Measures Analysis of Variance

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>Fcal</u>	<u>Ftab</u>
A Sex of Rater	1	146.31	4.30	.0449 *
Error A	38	34.00		
B Sex of Slide	1	68.91	2.89	.0971
A X B	1	668.31	28.06	.0001 *
Error B	38	23.82		
C Pose of Slide	1	701.41	32.91	.0001 *
A X C	1	28.06	1.32	.2584
Error C	38	21.31		
B X C	1	79.81	2.04	.1611
A X B X C	1	166.06	4.25	.0461 *
Error BC	38	39.06		

\* statistical significance

**Table V**Summary Table

Simple Main Effects Analysis of the  
Significant Two-Way Interaction

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F cal</u>	<u>Ftab</u>
A at B1	1	189.22	189.22	6.55	4.10 *
A at B2	1	1221.02	1221.02	42.24	7.35 **
error	38		28.91		
B at A1	1	970.22	970.22	40.73	7.35 **
B at A2	1	308.02	308.02	12.93	7.35 **
error	38		23.82		

\* significance at .05 level

\*\* significance at .01 level

## CELL TOTALS

	B1	B2
A1	706	903
A2	793	682

## Chapter 4

### Discussion

The results of the present experiment support the hypothesis that children who suck their thumbs are perceived unfavorably by their peers. The highly significant main effect for the pose of the slide suggests that the first-grade students, who viewed the slides responded more favorably to the non-thumbsucking child than to the thumbsucking child. Both the boy and girl raters gave a more favorable social attractiveness composite score to the slide of the girl not thumbsucking than to the slide of the same girl thumbsucking. Similarly, the boy raters also gave a more favorable composite score to the slide of the boy not thumbsucking than to the slide of him thumbsucking. However, for these same slides of the boy thumbsucking and not thumbsucking the girl raters mean composite scores were almost identical. The pose of the boy in the slide appeared to have no overall effect on the girls perceptions of his social attractiveness for the 10 questions used in this experiment. This result may have been due to the nature of the questions, although if this is true, it did not seem to affect the ratings given by the girl raters to the girl slides. The girl raters mean composite scores for both

poses of the boy slide are approximately as low as the mean composite score given by the boy raters to the boy thumbsucking. This suggests that the girls rated both boy slides as unfavorable in comparison with the boys ratings of the same slides. From these scores it appears that a boy who sucks his thumb during his first year of school will receive less favorable social evaluations by his male peers, while a girl who sucks her thumb in her first year of school will receive less favorable social evaluations by both her male and female peers.

The significant three-way and two-way interactions provide further support to the hypothesis that children in the first-grade are viewed less favorably by both sexes of peers when they suck their thumbs. This was determined using a simple main effects analysis of the significant interaction between the sex of the rater X the sex of the child in the slide. The sex of the child in the slide had a significant effect on the mean scores of the sex of the raters. The boy raters gave a higher or more favorable rating to the boy slides, just as the girls gave a higher or more favorable rating to the girl slides. This result in the data would appear to be intuitive. Most people would logically assume that at the first-grade level a child would be more comfortable with peers of the like sex.



The analysis also showed that there were no significant differences in the mean scores assigned to the slide of the boy sucking and the girl sucking, and the slide of the boy not sucking and the girl not sucking. This suggests that the student raters treated both the sexes of children in the slides equally when considering the action of sucking or not sucking of the thumb. From this data it appears to be less socially acceptable at the first-grade level for either sex of the child to suck their thumb than to not suck their thumb.

The second non-significant two-way interaction indicates that there were no significant mean differences in the composite scores due to the sex of the child rater in regard to the pose of the child in the slide. The mean composite scores for both the girl and boy raters show the thumbsucking pose was viewed less favorably than the non-thumbsucking pose.

Viewing the cell totals of the simple main effects analysis and the mean composite scores in their rank order provides additional insight into the breakdown of the ratings. The highest cell total from the simple effects analysis was the girl ratings of girl slides, while the lowest is boys ratings of the girl slides. The overall highest mean composite score was given by the girl raters to

the non-thumbsucking pose of the girl slide, while the overall lowest mean composite score was given by the boy raters to the pose of the girl thumbsucking. Overall the girls raters gave slightly higher scores than did the boys. The girl raters mean composite scores for both the boy and girl subjects were slightly higher on both the sucking and non-sucking poses. However, the boy raters mean composite score for the non-thumbsucking poses was higher than the girl raters mean composite score for the sucking poses. So while the girl raters did appear to be more favorable in their responses, this response set was not enough to overshadow the effect of the thumbsucking by the child in the slide.

The etiology of the behavior of thumbsucking remains a scientific question with many possible answers. But regardless of the underlying causes for the origin and manifestation of this habit its physiological, psychological, and social ramifications are becoming more evident. Past research has conclusively shown that chronic thumbsucking has been the cause of dental and digital malformities. Many researchers have also suggested that thumbsucking may be a contributing factor to social and psychological problems of childhood. But our understanding of the social issues surrounding thumbsucking and their

effects on future development of the child is clearly incomplete. The present study, although a pilot, has provided interesting new data concerning the negative social effects thumbsucking may have on children. This data suggests that the behavior of thumbsucking displayed in the school setting may lead to unfavorable peer perceptions of the thumbsucking child. The initial years of the educational process have been shown to be valuable to both the intellectual and social maturation of a child. This maturation may be being delayed or impaired due to persistent thumbsucking. This study was the first to focus on the peer perceptions of thumbsucking in school-aged children. Being the first the results should be interpreted narrowly and cautiously. However, this caution should be tempered with the knowledge that the results suggest thumbsucking may be harming the social relationships and development of the child. Because these social relationships are critical to child development, and thumbsucking may be directly interfere with them, eliminating thumbsucking may result in fewer of these problems and contribute to child development.

Future research in the area of thumbsucking and its relation to social development should keep in mind some of the following caveats. The present experiment used a

questionnaire composed of ten questions dealing with a variety of socially relevant topics. Future research in this area may include different questions measuring other apposite aspects of social and personal involvement with thumbsucking children. Studies may also be done using children of different ages to see if older or younger thumbsuckers are rated any more harshly or favorably by the different ages. It may also be particularly helpful to determine how brothers and sisters feel about siblings who suck thumbs. This may provide needed information to professionals involved with solving the problems surrounding thumbsucking children. Although peers' perspectives of the habit was the focus of the present experiment the perspective of adults also appears to be an area that should be explored.

The results of this pilot study concerning the social relevance of thumbsucking in first-graders, indicates that first-grade students view thumbsucking classmates less favorably than non-thumbsucking classmates. This unfavorable "low status" assignment may lead to future developmental, educational, and social problems.

## Appendix A

### Study Description & Instructions

This is a study of first-graders' attitudes. Attitudes are just the different ways we (you) feel about certain things, such as how we feel about other people, places, or activities. For example some kids like Hulk Hogan and others don't, or some kids like skating and others like playing soccer. And it is good that different people have different attitudes and like different things. Attitudes are not right or wrong they are just the way we feel. So today we would just like to find out some of your attitudes, or how you feel about some pictures of other kids. We are just going to show you some pictures of a bunch of different kids and have you answer a few questions. OK? **The kids in the pictures you are going to see are your age, and your grade level, but go to a school in another city, ok?** When I show these pictures I would like everyone to sit quietly and just answer the questions by the way you feel after seeing the picture.

(Pass out the question and answer sheets.)

## Appendix B

### Instructions for Questions and Answers

Does everyone have the question and answer sheets? For each picture you see you are going to answer these same ten short questions. There are three answers you have to choose from for each of the questions. Those three answers are located right below the questions. (Questions) Now lets go over some possible questions and the three possible answers to make sure everyone understands.

#### **QUESTIONS**

1. How much would you like this person as your friend?  
(this could be a friend at school, at home in your neighborhood, anywhere)

- A. A lot
- B. A little (this would be like average)
- C. Not at all (this means you really wouldn't want them as a friend)

2. How smart do you think this person is? (smart can mean intelligent, does good in school)

- A. Very smart

B. Smart (this is about the same smart as most kids)

C. Not Smart (this means they aren't as smart as most kids)

3. How happy do you think this person is? (this is just happy about anything)

A. Very happy

B. Happy

C. Sad

4. How good looking do you think this person is? (this is for both boys and girls, they can both be good looking, pretty, attractive, cute)

A. Very good looking

B. good looking

C. Not good looking

Does everyone understand these questions? If you don't just raise your hand. The questions are really pretty easy, and all you have to do is just answer them the way you feel, ok, remember there are no right or wrong answers.

## Appendix C

- 1 How much do you think you would want this person in your classroom?
  - A. A lot
  - B. A little
  - C. Not At All
  
- 2 How much do you think you would want to sit next to this person at school?
  - A. A lot
  - B. A little
  - C. Not At All
  
- 3 How smart do you think this person is?
  - A. Very Smart
  - B. A little Smart
  - C. Not Smart
  
- 4 How much do you think you would want this person as your friend?
  - A. A lot
  - B. A little
  - C. Not At All
  
- 5 How much do you think you would want this person to live next door to you?
  - A. A lot
  - B. A little
  - C. Not At All
  
- 6 How fun do you think this person is?
  - A. Very Fun
  - B. Sort of Fun
  - C. Not Fun
  
- 7 How happy do you think this person is?
  - A. Very Happy
  - B. Sort of Happy
  - C. Not Happy



- 8 How much do you think you would want to play with this person?
- A. A lot
  - B. A little
  - C. Not At All
- 9 How much do you think you would like this person?
- A. A lot
  - B. A little
  - C. Not At All
- 10 How pretty do you think this person is?
- A. Very Pretty
  - B. Sort of Pretty
  - C. Not Pretty

## Appendix D

### First Grade Students Attitudes Toward Thumbsucking

Dear Parents:

Your child has been identified as meeting the selection criteria for participation in a research project on social attitudes towards thumbsucking. The selection criteria are that your child is enrolled in the first grade in the Westside School system. This research project will be conducted by Dr. Patrick C. Friman, Department of Psychology, University of Nebraska Medical Center, Dr. Joseph C. LaVoie and Keith McPherson, Department of Psychology, University of Nebraska at Omaha. The research project has been approved by the Director of Research for your School District, the principal of the school attended by your child, and the Institutional Review Board of the University of Nebraska.

The study in which your child is invited to participate in is interested in identifying first grade students' attitudes towards children who suck their thumbs. To assess this attitude, the students involved will view eight photographed slides of boys and girls their grade level but from another city, and answer ten short, simple questions about the person in the slide. Some of the slides will be of thumbsucking children, and some will be of children not sucking their thumb. Each child will be given a question and answer sheet to make their individual responses on. On the answer sheet all that is required is circling or marking the response they feel fits, there are no right or wrong answers. The students will be asked **NOT** to put their name on their paper, as we are only interested in responses. The students will view the slides as a class in their rooms at school. No names will be attached to any answer sheets, and all information collected will be confidential.

The information obtained from this study will benefit society by allowing us to further understand the social attitudes children develop when interacting with others at school.

Insofar as we can determine, there are **no** risks involved in this study. Your child will simply be answering

a short series of questions, none of the questions are of a personal nature or intrusive. All the questions have been reviewed and approved by you school administrative staff. Your child's participation in this study is very important, and will be greatly appreciated.

If you have any questions regarding this research project, please call Dr. Patrick Friman, 559-6408 (work), 342-6133 (home), or Keith McPherson, 559-6087 (work), or 496-7521 (home). YOU ARE VOLUNTARILY MAKING A DECISION WHETHER OR NOT TO ALLOW YOUR CHILD/LEGAL WARD TO PARTICIPATE. YOUR SIGNATURE INDICATES THAT, HAVING READ THE INFORMATION PROVIDED ABOVE, YOU HAVE DECIDED TO PERMIT YOUR CHILD/LEGAL WARD TO PARTICIPATE. UPON REQUEST YOU WILL BE GIVEN A COPY OF THIS CONSENT TO KEEP.

Thank you, Sincerely,

Patrick C. Friman, Ph.D.  
Asst. Professor Pediatrics, UNMC

Keith M. McPherson, Masters Candidate

Joseph C. LaVoie, Ph.D.  
Professor, UNO

Paul Nelson,  
Hillside School Principal

### References

- Altman, K., Grahs, C. & Friman, P.C. (1982). Treatment of unobserved trichotillomania by attention reflection and punishment of an apparent covariant. Journal of Behavior Therapy and Experimental Psychiatry, 13, 337-340.
- Andrews, R.B. (1961). Thumbsucking. Journal Southern California Dental Association, 29, 324-329.
- Amidon, E.J. & Hoffman, C. (1965). Can teachers help the socially rejected? Elementary School Journal, 66, 149-154.
- Azrin, N.H., Nunn, R.G. & Frantz-Renshaw, S. (1980). Habit reversal treatment of thumbsucking. Behavior Research & Therapy, 18, 395-399.
- Baalack, I. & Frisk, A. (1971). Finger sucking in children a study of incidence and occlusal conditions. Acta Odont Scandinavia, 29, 499-512.
- Berland, T., & Seyler, A.E. (1968). Your Children's Teeth. New York: Meredith Press.
- Bishop, B.R., & Stumphauzer, J.S. (1973). Behavior therapy of thumbsucking in children: A punishment (time-out) and generalization effect - what's a mother to do? Psychological Reports, 33, 939-944.
- Bonney, M.R. (1971). Assessment of efforts to aid socially

- isolated elementary school pupils. Journal of Educational Research, 64, 345-364.
- Cambell Reid, D.A., & Price, A.H.K. (1984). Digital deformities and dental malocclusion due to finger sucking. British Journal of Plastic Surgery, 37, 445-452.
- Campbell, P.M. (1984). Simultaneous correction of digital sucking habits and posterior crossbite with a combo appliance. Journal of Clinical Orthodontics, 28(4), 254-256.
- Cattell, R. (1972). Raising Children With Love and Limits. Chicago: Nelson-Hall Company.
- Cerny, R. (1981). Thumb and finger sucking. Australian Dental Journal, 26, 167-171.
- Christensen, A.P., & Sanders, M.R. (1987). Habit reversal and differential reinforcement of other behavior in the treatment of thumbsucking: An analysis of generalization and side-effects. Journal of Child Psychology & Psychiatry, 28(2), 281-295.
- Doke, L.A., & Epstein, L.H. (1975). Oral overcorrection: Side effects and extended applications. Journal of Experimental Child Psychology, 20, 496-511.
- English, O.S., & Pearson, G.H.J. (1945). Emotional Problems of Living. New York: Norton.

- Finch, S.M. (1960). Fundamentals of Child Psychiatry. New York: Norton.
- Finney, J.W., & Friman, P.C. (1988). The prevention of mental retardation. In D.C Russo & J.H. Kedesdy (Eds.), Behavioral medicine with the developmentally disabled (pp. 173-200). New York: Plenum.
- Freud, S. (1905). Three Essays on the Theory of Sexuality. London: Hogarth Press.
- Freud, S. (1938). Three contributions to the theory of sex. In Brill AA (Ed.). The Basic Writings of Sigmund Freud. New York: Random House.
- Friman, P.C. (1988). Chronic Thumbsucking: A threat to wellness in middle childhood. Wellness Perspectives 5, 7-13.
- Friman, P.C., Barone, V.J., & Christopherson, E.R. (1986). Aversive taste treatment of finger and thumbsucking. Pediatrics, 78(1), 174-176.
- Friman, P.C., Finney, J.W., & Christophersen, E.R. (1984). Behavioral treatment of trichotillomania: An evaluative review. Behavior Therapy, 15, 249-266.
- Gellin, M.E. (1978). Digital sucking and tongue thrusting in children. Dental Clinics of North America, 22(4), 603-619.

- Graber, T.M. (1958). Fingersucking habit and associated problems. Journal of Dentistry in Children, 25, 145.
- Haryett, R.D., & Hansen, F.C. (1970). Chronic thumbsucking. American Journal of Orthodontics, 57(2), 164-178.
- Haryett, R.D., Hansen, F.C., Davidson, P.O., & Sandilands, M.L. (1967). Chronic thumbsucking: The psychologic effects and the relative effectiveness of various methods of treatment. American Journal of Orthodontics, 53, 569.
- Hymel, S. (1986). Interpretations of peer behavior: Affective bias in childhood and adolescence. Child Development, 57(2), 431-445.
- Infante, P.F. (1976). An epidemiologic study of finger habits in preschool children, as related to malocclusion, socioeconomic status, race, sex, and size of community. Journal of Dentistry for Children, 43, 33-38.
- Kauffman, J.M., & Scranton, T.R. (1974). Parent control of thumbsucking in the home. Child Study Journal, 4(1), 1-10.
- Klackenberg, G. (1949). Thumbsucking: Frequency and etiology. Pediatrics, 4, 418-424.



- Knight, M.F., & McKenzie, H.S. (1974). Elimination of bedtime thumbsucking in home settings through contingent reading. Journal of Applied Behavior Analysis, 7, 33-38.
- Larsson, E.F., & Dahlin, K.G. (1985). The prevalence and the etiology of the initial dummy and finger sucking habit. American Journal Orthotics, 87, 432-435.
- Lapouse, R., & Monk, N. (1959). Fears and worries in a representative sample of children. American Journal of Orthopsychiatry, 57, 803-818.
- Lerner, R.M., & Schroeder, C. (1971). Physique identification, preference, and aversion in kindergarten children. Developmental Psychology, 5, 538.
- Lewis, S. (1962). The effect of thumb and finger sucking on the primary teeth and dental arches. Child Development, 8, 93-98.
- Lichstein, K.L., & Kachmarik, G. (1980). A non-aversive intervention for thumbsucking: Analysis across settings and time in the natural environment. Journal of Pediatric Psychology, 5(4), 405-414.
- Lipsett, L.P., Kaye, H., & Bosack, T. (1966). Enhancement of neonatal sucking through reinforcement. Journal of Experimental Child Psychology, 4, 163-168.

- Maddox, G.L., Back, K.W., & Leiderman, V.R. (1968).  
Overweight as social deviance and disability. Journal of Health and Social Behavior, 9, 287-298.
- Massler, M. (1968). Oral habits, origin, evolution and current concepts in management. Diastema 2(13).
- Massler, M. (1983). Oral habits: Development and management. The Journal of Pedodontics, 109-119.
- Mueller, E., & Brenner, J. (1977). The origins of social skills and interaction among play group toddlers. Child Development, 48, 854-856.
- Murray, A.B., & Anderson, D.O. (1969). The association of incisor protrusion with digit sucking and allergic nasal itching. Journal of Allergy, 44, 239-247.
- Newson, J., & Newson, E. (1968). Four Years Old in an Urban Community. London: George Allen & Unwin.
- Newson, J., Newson, E., & Mahalski, P.A. (1982). Persistent infant comfort habits and their sequelae at 11 and 16 years. Journal of Child Psychology and Psychiatry, 22(4), 421-436.
- Norton, L.A., & Gellin, M.E. (1968). Management of digital sucking and tongue thrusting in children. Dental Clinics of North America, 12, 363-382.
- Nwachukwu, F.J. (1980). Control of thumbsucking in a classroom. Psychological Reports, 34, 327-330.

- Ozturk, M., & Ozturk, O.M. (1977). Thumbsucking and falling asleep. British Journal of Medical Psychology, 50, 95-103.
- Pagano, R.R. (1986). Understanding Statistics in the behavioral sciences. (2nd ed.). St. Paul: West Publishing Company.
- Palermo, D.S. (1956). Thumbsucking, a learned response. Pediatrics, 17, 392.
- Popovich, F., & Thompson, G.W. (1974). Thumb and finger sucking: Analysis of contributory factors in 1,258 children. Canadian Journal of Public Health, 56, 277-280.
- Ribble, M. (1943). The Rights of Infants. New York: Columbia University Press.
- Ribble, M. (1944). Infantile experience in relation with personality development. Personality and the Behavior Disorders. New York: Ronald Press.
- Rinchuse, D.J., & Rinchuse, D.J. (1986). Overcoming finger sucking habits. Journal Clinical Orthodontics, 20(1), 46-47.
- Ripa, L.W., & Barenie, J. (1975). Thumbsucking relationship to malocclusion and treatment. Journal of Connecticut State Dental Association, 49, 154-162.

- Roberts, J., & Baird, J.T. (1971). Parent Ratings of Behavioral Patterns of Children. Department of Health, Education, and Welfare, No. (HS) 72-1010.
- Roff, M., Sells, S.B., & Golden, M.M. (1972). Social Adjustment and Personality Development in Children. Minnesota: University of Minnesota Press.
- Ross, J.A. (1974). Use of teacher and peers to control classroom thumbsucking. Psychological Reports, 34, 327-330.
- Ross, J.A. (1975). Parents modify thumbsucking: a case study. Journal of Behavior Therapy and Experimental Psychiatry, 6, 248-249.
- Rubel, I. (1986). Atypical root resorption of maxillary primary central incisors due to digital sucking: a report of 82 cases. Journal of Dentistry for Children, 83, 201-204.
- Rubin, K.H., & Beirness, T.A. (1983). Concurrent and predictive correlates of sociometric status in kindergarten and grade one children. Merrill-Palmer Quarterly, 29, 337- 351.
- Smith, G.J. (1985). Facial and full-length ratings of attractiveness related to the social interactions of young children. Sex Roles, 12(3), 287-293.

- Spock, B. (1957). Baby and Child Care. New York: Pocket Books.
- Tilton, M.D. (1980). Hypnotic treatment of a child with thumbsucking, enuresis, and encopresis. The American Journal of Clinical Hypnosis, 22(4), 238-240.
- Traisman, A.S., & Traisman, H.S. (1958). Thumb and finger sucking: A study of 2,650 infants and children. Journal Pediatrics, 52, 566-572.
- Van Houten, R., & Rolider, A. (1984). The use of response prevention to eliminate nocturnal thumbsucking. Journal of Applied Behavior Analysis, 17, 509-520.

