A BEHAVIORAL APPROACH TO THE CONTROL OF THUMBSUCKING IN THE CLASSROOM¹

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The purpose of the present study was to determine whether classroom thumbsucking could be controlled by making social reinforcement contingent upon appropriate behaviors incompatible with thumbsucking. The classroom thumbsucking behavior of three 8-yr-old elementary school children was observed and recorded by two observers. Sixteen experimental lessons were divided into sets of baseline, reinforcement, reversal, and representation of reinforcement. The effect of the experimental treatment was determined by the changes in the total thumbsucking level for each subject during each lesson. Results indicated noticeable decreases in thumbsucking rate for all three subjects during lessons in which social reinforcement was made contingent upon appropriate behavior. Two of the three subjects showed sudden increases in thumbsucking time during lessons when social reinforcement for appropriate responses was withheld; the third subject showed continued low thumbsucking time during these lessons.

Recent studies have shown the successful application of reinforcement contingencies for appropriate behavior within the classroom. Becker, Madsen, Arnold, and Thomas (1967) studied the use of teacher attention and praise in reducing and eliminating specific classroom behavior problems. A more recent study was undertaken to determine whether a specific classroom behavior such as studying could be effectively controlled by teacher attention (Hall, Lund, and Jackson, 1968).

The use of reinforcement contingency in controlling thumbsucking behavior was attempted within a laboratory setting by Baer (1962). During alternate periods, Baer punished thumbsucking behavior by turning off a cartoon as long as thumbsucking continued; the cartoon was re-presented whenever thumbsucking discontinued.

The present study attempted to control thumbsucking behavior outside of the laboratory within a classroom setting in a public school. Praise and attention were made contingent upon behavior that was incompatible with thumbsucking and the effects of such contingencies upon the thumbsucking behavior were determined.

METHOD

Subjects

Audrey was a third-grade student whose guidance reports showed a history of thumbsucking in both the classroom and at home. Her teacher reported in interviews that Audrey was apt to "blame" herself whenever she could not "understand" or do her classwork. Since her class as a whole was high-achieving, Audrey was often "ill-at-ease" when she could not do the work. Failure to do her work would often seem to lead Audrey to start thumbsucking. When praised by her teacher, Audrey seemed "overjoyed" to the extent that she would "do anything to keep this attention".

Betty was a third grader whose guidance reports described a history of negative attitudes toward teachers and an inability to adjust socially to her classmates. Guidance reports also described a tired, moody, and sometimes insolent girl who constantly demanded attention. Betty's thumbsucking was reported to occur anytime throughout the day, but to increase when she was scolded by her teacher.

Betty showed a positive response towards her teacher's attention and praise, and became completely "cooperative" when her teacher would use her on an errand. However, when her teacher discontinued this attention, Betty

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would appear to revert back to "uncooperative" behavior.

Carol was a third grader who was the closest to what a teacher considered a "model student". Her social behavior, self-control, and class participation were reported to be excellent by all of her teachers. Although her classroom achievement was high, Carol often appeared "tired" and would rest her head on her arms and thumbsuck. A teacher reported in an interview that Carol responded positively to the infrequent attention given to her. Carol's teacher also reported that her classroom thumbsucking was most evident when she was not busy at work or play.

The experimenter secured permission from both the parents and teacher of each selected child to conduct the study. Each subject was selected from a different class within the third-grade level of a public elementary school in New York City. The experimenter arranged to teach each class twice per week for nine weeks.

Identification and Measurement of the Response

The response measured was a basic thumbsucking response. A "thumbsuck" was defined as any response resulting in the thumb either touching the lips or going into the child's mouth.

Two assistants were introduced to the class as student-observers and were seated on opposite sides in the rear of the classroom. The assistants began observing the class one week before the experiment started. The two lessons within this week were considered "orientation" lessons: these were used to adapt the class to the assistants' presence and to check on the reliability of the assistants' measurements of the subjects' thumbsucking.

The observers were assigned cumulative stopwatches and were instructed to start the stopwatch whenever a child placed her thumb on her lips or in her mouth. The assistant was to stop the watch whenever the thumb was removed. Reliability was determined by comparing each assistant's total thumbsucking time for each of the two orientation lessons. For purposes of reliability, each assistant's stopwatch was checked after each orientation lesson and was compared to the other assistant's time. Inter-observer reliability by the Pearson product-moment method was 0.98.

During each of the 16 experimental lessons, the thumbsucking time for each child was converted into an average (in seconds) of the two observers' times. Therefore, a time of 6:06 was converted to 366 sec.

Reinforcement of Appropriate Responses

There were three responses upon which social reinforcement was made contingent. These responses were defined as (a) folding of subject's hands on desk, (b) folding of subject's arms on desk, and (c) the subject writing in her notebook. Since thumbsucking was unlikely to occur during any of these appropriate responses, they were considered incompatible with thumbsucking.

The experimenter gave attention and praise to appropriate behaviors during parts of the lessons when reinforcement did not interfere with the continuity of the lesson. Since the management of the class (30 to 35 children) occupied a large percentage of the experimenter's time, a planned reinforcement schedule was not attempted. Rather, the reinforcement was given intermittently throughout the 50-min lessons.

RESULTS

Audrey

A relatively high baseline thumbsucking level (see Fig. 1) was manifested by Audrey. Audrey was inattentive during these baseline lessons with several instances of prolonged thumbsucking.

With the application of reinforcement for appropriate responses during lessons 5 to 8, there was a decrease in thumbsucking level (see Fig. 1). Although Audrey's level did not show as sharp a decrease as the other two subjects, she nevertheless showed a lower level of thumbsucking in comparison to her baseline level (see Fig. 1). During lessons 5 to 8, Audrey would often look directly at the experimenter and smile. However, at certain times during these lessons, and especially when no reinforcement was given to her, Audrey would sometimes place her thumb in her mouth and look away from the experimenter.

During the first of the reversal lessons 9 to 12, Audrey showed an increasing thumbsucking level. This level (1530 sec) was almost three times as high as Audrey's average rate during lessons 1 to 4. Audrey's behavior dur-

Fig. 1. Thumbsucking duration (in seconds) for each subject during each of the 16 lessons.

ing lessons 9 to 12 included talking to her friends, looking away from experimenter, and resting her head on the desk. Her behavior

was characterized by inattentiveness and failure to follow instructions. However, during the next three reversal lessons (10 to 12) Aud-

rey's level gradually lowered until it was similar to the rate shown at the end of the baseline lessons (see Fig. 1).

There was a noticeable decrease in Audrey's thumbsucking level during lessons 13 to 16 (see Fig. 1). Audrey's level during these lessons was very similar to that of the first reinforcement lessons (5 to 8).

Betty

Betty's operant thumbsucking level (lessons 1 to 4) was lower in comparison to the other two subjects. The operant level remained consistently low except for lesson 4 in which it showed a sharp decrease (see Fig. 1). Betty's behavior during lessons 1 to 4 consisted of playing with objects on her desk and avoidance of facial contact with the experimenter. At times Betty would fall asleep while sucking her thumb.

Betty's thumbsucking level decreased sharply and remained at a consistently low rate during lessons 5 to 8. Betty seemed to make a great effort to respond appropriately when such responses were being reinforcement by attention and praise. After reinforcement Betty would sometimes fold her hands for extended lengths of time and look around the room to see if others were watching.

Compared to Audrey, Betty did not show as sharp an increase in thumbsucking level when reinforcement was discontinued during lessons 9 to 12. There was nevertheless an increase in level during lesson 9, but Betty's level gradually decreased till it was similar to that of lesson 4 (see Fig. 1). Betty's behavior during lessons 9 to 12 became similar to the inattentiveness shown by her during lessons 1 to 4. Such behavior consisted of playing and talking with her classmates.

Her rate during lessons 13 to 16 was consistently low and very similar to that of lessons 5 to 8 (see Fig. 1). Lessons 16 ended with Betty writing in her notebook and looking at the experimenter to obtain further instructions.

Carol

Carol's results showed a low thumbsucking level during lesson 1. This level rose consistently during lessons 2 to 4 (see Fig. 1). When the experimenter was not looking in her direction, Carol would rest her head on her desk and suck her thumb.

There was a decrease in Carol's level during lessons 5 to 8. Although a slight fluctuation occurred during lesson 7, there was nevertheless a noticeable decrease in her thumbsucking level during lessons 5 to 8. Carol's rate during these lessons was lower than the other two subjects (see Fig. 1).

Carol's level remained low during lessons 9 to 12. The low response rate continued even though she was not being reinforced for appropriate responses.

Except for a moderate fluctuation during lesson 14, there continued to be a consistently low thumbsucking level during lessons 13 to 16.

DISCUSSION

The initial objective of the study was to attempt to control a socially undesirable response in a classroom. The results, as represented by Fig. 1, show that this attempt was somewhat successful.

An initial disadvantage that faces any experimenter attempting such a study is the physical size of the class. With class sizes ranging from 25 to 35 children, management of routine lessons can in itself be quite arduous. Attempting to control experimentally the behaviors of specific children becomes an even greater task. It is easy to see, therefore, that control of variables in such a classroom situation may be quite difficult to maintain. Some of these variables were identified during the course of the study and will presently be discussed.

The experimenter was able to observe the subject for only two 50-min sessions per week. Effects of behavior of the subjects' parents and regular teacher towards the thumbsucking was not controllable in this study. It would be interesting to note how the thumbsucking would be affected if the regular teacher provided reinforcement contingency every day throughout the week. Even more interesting would be the effects of combined control by both the parents in the home setting and the teacher in the school setting. Further research is needed in this area.

Another important variable of interest in furthering the control of the child's behavior is that of random reinforcement by classmates. Wahler (1967) suggested that peer reinforcement may possibly take over when social rein-

forcement is not provided by the teacher. Although the measurement of such reinforcement would be quite difficult to obtain, the need for investigating its effects are important.

Equally important areas not covered in this study were the effects of the number of reinforcements given and also the method of presentation of such reinforcements. Research has shown the importance of schedules of reinforcement in conditioning behavior. No attempt was made to schedule the frequency of reinforcements in this study.

Table 1
Observer Reliability

Subjects	Observer A	Observer B
AUDREY		
(orientation 1)	5:35	5:38
(orientation 2)	4:59	5:04
BETTY		
(orientation 1)	7:15	7:15
(orientation 2)	8:12	8:04
CAROL		
(orientation 1)	9:27	9:31
(orientation 2)	6:52	6:59

The use of reinforcement contingency in eliminating undesirable behavior presents a

wide range of research possibilities. Control of behaviors ranging from simple idiosyncratic (calling out) to more overt (aggression) can be attempted by the teacher in the classroom. The results as shown in this study describe an attempt to control such a behavior (thumb-sucking) within a classroom in a public school.

REFERENCES

- Baer, D. M. Laboratory control of thumbsucking by withdrawal and re-presentation of reinforcement. *Journal of the Experimental Analysis of Behavior*, 1962, 5, 525-528.
- Becker, W. C., Madson, C. H., Arnold, C. R., and Thomas, B. A. The contingent use of teacher attention and praise in reducing classroom behavior problems. *Journal of Special Education*, 1967, 1(3), 287-307.
- Hall, R., Lund, D., and Jackson, D. Effects of teacher attention on study behavior. *Journal of Applied Behavior Analysis*, 1968, 1, 1-12.
- Wahler, R. Child-child interactions in free-field settings: some experimental analysis. *Journal of Experimental Child Psychology*, 1967, 5, 278-293.

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