CASE HISTORIES AND SHORTER COMMUNICATIONS

Use of Contingent Lemon Juice to Eliminate Public Masturbation by a Severely Retarded Boy*

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Summary—Contingent lemon juice successfully reduced and maintained at zero levels public masturbatory responses in a severely retarded boy with a four year history of this behavior. Previously, more common procedures (loud "no" plus hand spanking, ignoring) had proven to be ineffective. The lemon juice contingency was shown to be effective in a period of from 13 to 16 days (in both home and school settings) and was easily implemented by a parent, a teacher and a para-professional.

Most investigators who have treated persons for problems associated with masturbation have been concerned with shifting the stimuli associated with masturbation, (i.e. fetishes Marquis, 1970; Marshall, 1974; McGuire and Vallance, 1964; Thorpe, Schmidt, Brown and Castell, 1964). However, only two studies could be found that focused on the elimination of masturbation responses in certain situations. Wagner (1968) used an operant conditioning procedure (i.e. rewards for increasingly longer periods of not masturbating) to quickly eliminate compulsive public masturbation behavior in an 11 year old girl of normal intelligence. Mellstrom and Gelsomino (1976) successfully treated public masturbation in a prematurely aged 53 year old man by providing social attention, extra cigarettes, and a glass of wine contingent upon the absence of the target behavior.

Although no studies could be found which dealt with the elimination of public masturbation in severely/profoundly handicapped persons, this behavior is a problem of some magnitude both in institutions and special education classrooms. In a recent survey of the resident-life staffs from five institutions for the mentally retarded in the state of Washington, Landesman-Dwyer and Schuckit (1976) found that 'constant masturbation' was considered to be a major life problem in approximately 8% (range of 5.5% to 12.7%) of the residents. Similarly, an informal survey of a major special education center revealed that public masturbation in the classroom was a serious problem in approximately 27.8% to 33% of a group of severely/profoundly handicapped pupils (Shaw, 1977).

None of the techniques which have been reported for the treatment of masturbation fetishes (e.g. orgasmic reconditioning, contingent electric shock) or public masturbation (e.g. reinforcement of incompatible behavior) seemed appropriate for the treatment of public masturbation in a young, severely retarded boy. Although a contingent electric shock procedure may have been effective in this type of case, legal and ethical considerations (Cook, Altman, and Haavik, 1977; May, Risley, Twardosz et al., 1976) made it imperative to systematically investigate a less aversive procedure. This paper presents a successful treatment technique (i.e. contingent lemon juice) which was used to eliminate frequent public masturbation, the continuance of which would have resulted in re-institutionalization of a boy who had only recently been placed in his own home and in a community special education class.

The use of lemon juice as an aversive treatment procedure was first reported by Sajwaj, Libert and Agras (1974) and has subsequently been shown to be an effective technique for eliminating rumination. However, the effectiveness of the procedure in decrementing other target behaviors has not been determined. Lemon juice was selected as the aversive stimulus in the present study because, as noted by Sajwaj et al. (1974), it causes only mild discomfort and would not easily be abused as can be the case with electric shock. Furthermore, the procedure is portable and easily taught to parents and teachers.

METHOD

**Subject**

The subject was a 7.8 year old male from a severely multiply handicapped special education classroom. His diagnosis included moderate spastic hemiplegia, microcephaly and severe mental retardation. He also had minor motor seizures which were partially controlled through medication. This boy was ambulatory and very active. He was institutionalized from the age of 3 to 6, but was then returned to his natural home. Prior to treatment, the subject had engaged in public masturbation in the institution, at home and at school for a period of 4 years. This masturbatory behavior was a source of great concern to the subject's parents. They were embarrassed by his behavior both in public places and when visitors came to their home. The parents had seriously considered re-institutionalizing their son if public masturbation could not be controlled. However, private masturbation, e.g. in the bathroom or bedroom, was neither of concern to the parents nor considered ethically appropriate for intervention.

**Recording**

The target behavior was defined as occurring whenever the subject put either hand inside his pants and directed toward his penis. The hand was defined as being in the pants whenever at least one fingernail disappeared from the view of the observer. The response ended when the hand or fingers were removed

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from the pants. Public masturbation responses were defined as occurring anywhere outside of the subject's bedroom or bathroom at home or outside of the restroom at school.

A multiple baseline design was employed in which the subject's responses were recorded concurrently both at home and at school. Since the behavior occurred very frequently, a time-sampling technique was used for the data collection. The subject was observed continuously for 5-min periods. Six 5-min observation periods were conducted daily and at random times both at school and in the home. The total number of responses/day for the six observation periods was then summed separately for the home and the school.

Reliability data for the definition of the target behavior were gathered by having two observers positioned so that they could not see each other's data sheet, record the behavior during low, medium and high rates of occurrence. Overall reliability percentages were then computed by dividing the smaller total frequency by the larger total frequency for the two observers. Reliability data were gathered for 17 sessions at school and ranged from 67° to 100°, with a mean of 97°. These data were gathered by the subject's teacher (3rd author) and teacher aide (4th author). Reliability data were gathered in the home by having the senior author observe the target behavior along with the subject's mother. These data were collected for 4 sessions and ranged from 67° to 100°, with a mean of 84°.

Treatment Procedure

Since the baseline data in the school setting was the most stable, the treatment procedure was implemented there first. This design also had a major practical advantage since the methodology and the effectiveness of the treatment technique could be carefully monitored in the school before the subject's mother began using the procedure at home.

Treatment was carried out as follows: contingent upon the initiation of the target behavior, the subject's teacher or a teacher aide (and subsequently mother) would squirt 5-10 cc of lemon juice (unsweetened Real lemon brand) into his mouth with a plastic squirt bottle (Surber, Martin and Touchette, 1972). During the early stages of treatment the subject was under nearly constant observation, and the treatment procedure was always implemented as soon as possible after the target behavior occurred. The subject's mother carried the lemon juice in her purse when she took her son to public places. Both the parent and teachers made certain the lemon juice was always readily accessible for immediate use.

RESULTS

Figure 1 presents the total number of public masturbation responses for the six 5-min observation periods/day in both the school and home. Prior to the implementation of the lemon juice treatment contingency, the subject's parents and teachers had tried saying a loud "no" and spanking his hand whenever a masturbatory response occurred. Since data to assess the effectiveness of this procedure had not been collected, the baseline rate for the behavior was first gathered using the "no" plus hand-spanking technique. Figure 1 shows that under this condition the median number of responses/day at school was 34 (range of 17-61), while the median number of responses/day at home was 17 (range of 0-32). Not only did this procedure fail to eliminate the behavior, but it produced an increase in the number of responses occurring at school.

At this point, it appeared that the subject may have been masturbating in order to receive social attention from adults, even if that attention were spanking. Therefore, a second baseline condition was instituted in which the target behavior was totally ignored in both the home and the school. During the ignoring conditions, the frequency of the behavior remained approximately the same at school, where the median was now 31 (range 18-64). In the home setting, where the median was 24 (range 0-81), the ignoring condition seemed to dramatically increase the variability of the behavior. However, it seemed apparent that the behavior was not going to be extinguished under the ignoring condition in either setting.

When the lemon juice contingency was implemented in the school (day 18), the target behavior quickly decelerated and reached zero responses/day for the first time after only nine treatment days. After 16 treatment days the behavior stabilized and remained at zero levels in the school. While the treatment procedure was being used for 13 days in the school setting, the mother continued to collect baseline data at home under the ignoring condition. During this period, the home data were quite variable, possibly indicating some carry-over effects of the treatment procedure from the school.

The implementation of the treatment procedure in the home on day 43 resulted in an immediate decrease to near zero levels. After 13 days of treatment, masturbatory responses in the home stabilized at a zero level. Thus, although the rate of responding in the home during the ignoring condition was highly variable and showed a slight drop during the final two days, the effect of contingent lemon juice was an almost immediate reduction to zero levels and elimination of the previously observed variability.

Besides recording the number of masturbation responses, the total number of lemon juice administrations/day was also recorded for both the home and the school. In the school setting, the number of lemon juice administrations/day showed a sharp decline from 35 to 5 after five days of treatment, and a further decline to 0 after 12 days of treatment. During the entire time in which the lemon juice contingency was in effect in the school, there were 123 lemon juice administrations, with 110 of these occurring in the first 12 days. In the home setting, the effects of the treatment procedure were more rapid, possibly because the technique had already been well-established in the school. The maximum number of lemon juice administrations/day was three. Altogether there were a total of 26 lemon juice administrations in the home, 19 of these occurring in the first 12 days.

Daily data were gathered until day 75, at which time the target behavior had remained at zero levels for at least 11 continuous days in both settings. At this time the subject was placed on follow-up status and subsequent data were gathered on a weekly basis. The follow-up data extend for a period of six months following the onset of the weekly data gathering sessions. Data collection periods during follow-up show that the number of public masturbation responses/day has essentially remained at zero levels (i.e., three responses have been observed). Records of lemon juice administrations which reflect the entire day revealed a total of nine occurrences in both settings throughout follow-up.
DISCUSSION

The present study demonstrated that contingent lemon juice is an effective treatment procedure for eliminating public masturbation responses in a severely mentally retarded boy. The procedure was easily implemented by a parent, teacher and para-professional in home and school settings. These findings extend the generality of those of Sajwaj et al. (1974) by demonstrating that contingent lemon juice can be an effective punishing stimulus for responses other than rumination. In extending the use of contingent lemon juice to a new target behavior, it should be noted that the length of time needed for the treatment procedure to be effective was very similar for both the present study (13 to 16 days) and the original Sajwaj et al. (1974) study (17 days). Also, as in the Sajwaj et al. (1974) study, no detrimental side effects were observed. Although the subject would make facial grimaces whenever the procedure was implemented he did not spit the lemon juice out or otherwise make a mess.

In keeping with the importance of using the least restrictive treatment alternative, a procedure such as contingent lemon juice should always be tried before more aversive procedures (e.g. electric shock), except perhaps in life-threatening situations. The experimental design of the present study supports the effectiveness of contingent lemon juice in eliminating public masturbation responses for this subject. Further studies should help to clarify the parameters under which this promising treatment technique will be effective.

REFERENCES

Remission of Chronic Ruminative Vomiting through a Reversal of Social Contingencies*

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Childhood ruminative vomiting is the regurgitation of food, rechewing and swallowing with intermittent expectoration during ruminating episodes. The treatment of vomiting disorders in childhood ranges from long-term psychotherapy for mothers concurrent with a substitute mother figure for the child (Richmond et al., 1958; Stein et al., 1959) to avoidance conditioning and punishment using electric shock (Lang and McLean, 1969; Kohlenberg, 1970; Toister et al., 1975). These studies describe the ruminating syndrome as life-threatening. The histories of the parent-child relationships, except for the institutionalized female in Kohlenberg's study, indicate deficits in interaction as a result of 'maternal psychosis' or minor disturbances in daily living affecting mother-child interaction. Toister et al. (1975) suggested that the etiology of learned vomiting disorders may be a function of attention (positive reinforcement) directed to 'normal' vomiting episodes during infancy.

Wright (1977) used a graphic display of the respondent and operant paradigms in a similar etiology analysis of learned illness behavior, and described aspects of pain, constipation, vomiting, asthma and related psychosomatic disorders in childhood as a function of attention, frequently in the form of medical treatment, immediately following symptoms of illness. Hammond (1974) investigated the longitudinal effects of childhood vomiting. He reported a study of 12 adult patients who had experienced vomiting episodes throughout childhood. Hammond concluded that these patients, in the absence of symptom remission, continued to have gastro-intestinal symptoms, more frequent psychological disturbances, and an increased risk of migraine through adult life. The present case study presents a behavioral-medical treatment model for chronic ruminating through an ecological analysis of contingencies and a model for behavioral diagnosis of vomiting concurrent with disease diagnosis. Also presented are intervention strategies less aversive than the standard shock avoidance and punishment procedures.

CASE HISTORY

June, a female, was born prematurely weighing 4.5 pounds. There was an onset of ruminative vomiting at three and a half weeks of age. At age six weeks, she was placed on a Seven-Up and strained food diet; this diet, subsequent diet changes, and intermittent hospitalizations effected no change in ruminative vomiting frequency.

June was described as taking food avidly then ruminating at the termination of each meal as well as intermittently between meals. The mother summarized her reaction to the ruminating as becoming upset and concerned while immediately attending to the child. There were no reported periods of vomiting remission at home or in the inpatient setting.

At the time of admission to inpatient status June was nine months of age and weighed eight pounds.