EFFECTS AND SIDE-EFFECTS OF A BRIEF OVERCORRECTION PROCEDURE IN REDUCING MULTIPLE SELF-STIMULATORY BEHAVIOUR: A SINGLE CASE ANALYSIS

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Many mentally retarded and autistic children engage in self-stimulatory behaviour, for example, head-weaving, body-rocking, finger-manipulating, and hand-waving. Such forms of behaviour are incompatible with learning since they compete with a child's attention and interfere with the development of functional responding. In recent years, positive practice overcorrection has been demonstrated to be an effective method of reducing self-stimulation (Epstein, Doke, Sajwaj, Sorrell and Rimmer, 1974; Foxx and Azrin, 1973; Wells, Forehand, Hickey and Green, 1977). This procedure requires a child to engage in a period of exaggerated incompatible motor responses contingent on self-stimulatory behaviour.

Overcorrection has effectively reduced self-stimulation in a variety of applied settings including community day-treatment programmes (Epstein et al., 1974; Foxx and Azrin, 1973), university affiliated projects (Wells et al., 1977), and residential wards (Azrin, Kaplan and Foxx, 1973). There have been few studies, however, examining the use of overcorrection in the public school special education classroom. In two case studies, Luiselli, Helfen, Pemberton and Reisman (1977) and Townsend and Marholin (1978) found that special education teachers could apply overcorrection procedures in an efficient manner which led to rapid and lasting suppression of self-stimulation. Since many retarded and autistic children attend public schools, the use of overcorrection to prevent self-stimulatory behaviour is worth examination.

The use of overcorrection by special education teachers has several disadvantages. These include the fact that overcorrection can be time-consuming (Forehand and Baumeister, 1976), has been correlated with negative side-effects (Epstein et al., 1974; Rollings, Baumeister and Baumeister, 1977), and does not always lead to lasting response suppression (Rollings et al., 1977). These disadvantages are particularly salient since the special education teacher is frequently confronted with several children who exhibit problem behaviour.

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The purpose of the present study was to investigate the use of a positive practice overcorrection procedure to reduce the self-stimulatory behaviour of a mentally retarded child enrolled in a public school special education classroom. Three major questions of practical concern were posed: (1) Could overcorrection be applied without a large investment of teacher time? (2) Would the procedure be free of negative side-effects? and (3) Would treatment effects be enduring?

**METHOD**

**Subject and Setting**

The subject was a ten-year-old institutionalised male, diagnosed as moderately retarded, with a Vineland Social Quotient of 34. He was toilet-trained and could feed himself but was otherwise lacking in most independent skills. The most serious problem posed by the subject, and the one studied in this investigation, was the high frequency of self-stimulatory forms of behaviour. The subject engaged in several stereotyped hand movements (to be described later) which seriously interfered with teaching efforts. Self-stimulation had been prevalent for several years before the study and both teachers and institutional aides agreed that the reduction of such behaviour was a primary treatment goal. Four days a week the subject attended a public school special education classroom with seven other children. The class day was structured into a series of thirty-minute training sessions (e.g., pre-academics, motor imitation) and fifteen-minute reinforcement activities (e.g., snack, music). Three teachers conducted activities from 9.00 a.m. to 3.30 p.m. each day.

The study was performed in a 7m × 7m area of a large classroom. The area contained eight desks arranged in a large semi-circle. Preceding each reinforcement activity, all students sat at their desks for a three-minute waiting period while one teacher prepared materials for the forthcoming event. During the waiting period, two teachers supervised a group of four students each. The goal during these periods was to develop proper sitting and waiting behaviour, and following the periods, to teach each student to: (1) attend to a teacher when his/her name was called, (2) stand up when instructed to do so, and (3) walk to a designated area of the classroom upon direction. As such, these periods were scheduled as formal training sessions and not simply an interval between activities. Seven three-minute periods were scheduled each day.

**Target Behaviours and Data Recording Procedures**

When sitting at his desk during the waiting periods the subject exhibited four self-stimulatory types of behaviour: loud tapping of the desk top with fingers and hands (Tapping); rapid rubbing of face with hands (Rubbing); waving hands before the eyes (Waving); and slapping head with the open palm of one hand (Slapping). These were observed during the seven periods each day using an interval recording procedure. A trained observer sat 3 m. in front of the subject’s desk. The subject was observed on a fifteen-second observe, five-second record format for twelve consecutive fifteen-second intervals (three minutes). The observer scored the first
occurrence of any of the four types of behaviour during an interval. On twenty-one occasions distributed across all experimental phases, a second observer was present to assess reliability. Using a scored-interval (S-I) method of reliability calculation (cf. Hawkins and Dotson, 1975), inter-observer reliabilities averaged 100 per cent for tapping, 86.6 per cent for rubbing (range 81.8-100 per cent), 100 per cent for waving, and 100 per cent for slapping.

**Procedures**

The study consisted of an ABCBAB design with “A” representing baseline phases, “B” representing reinforcement phases, and “C” representing reinforcement plus overcorrection phases.

**Baseline** (14 days). The subject was observed and self-stimulatory types of behaviour were not consequated. A teacher moved in a radius of 1 m. in front of the subject’s desk in order to simulate conditions imposed during treatment (see below). The teacher in this position moved about and avoided making eye-contact with the subject.

**Reinforcement** (4 days). The subject was praised every fifteen seconds (FI 15-secs.) as long as his hands were resting on his lap. He was presented with an edible (peanut, popcorn) every thirty seconds (FI 30-secs.) contingent upon “hands down” behaviour. If he was engaged in self-stimulation at the end of a thirty-second interval, he was told, “Put your hands down”. Three to five seconds following compliance with this instruction, he was praised for sitting with “hands down”.

**Reinforcement plus Overcorrection** (10 days). The subject continued to receive praise, edibles, and prompts for appropriate sitting. In addition, he received *Overcorrection Functional Movement Training* (Foxx and Azrin, 1973) contingent upon tapping only. Overcorrection consisted of stating, “No tapping”, requiring the subject to stand up beside his desk, and instructing him to perform a series of four arm movements: arms in front of body, arms at sides of body, arms overhead, and arms wrapped across chest. Because the subject was under limited instructional control, each instruction was stated verbally by the teacher, who then physically guided the subject through the proper movements with each movement held in place for four seconds. The four arm movements were repeated four times. Each overcorrection episode, therefore, lasted approximately one minute. At the conclusion of the overcorrection episode the subject was told, “Sit down and put your hands down”. Five seconds following this request, he was praised for having hands on his lap. Overcorrection was only made contingent upon tapping behaviour, and occurrences of rubbing, waving, and slapping behaviour were not consequated.

**Reinforcement** (3 days). Prompts and reinforcement of hands on lap behaviour remained in effect, but overcorrection for tapping was discontinued.

**Baseline** (8 days). Conditions identical to the original baseline phase were re-instituted.

**Reinforcement** (6 days). Prompting and reinforcement of hands on lap behaviour was again introduced.
Follow-up (2 months, 3.5 months). The subject's behaviour was observed during a follow-up period two months from, and 3.5 months from, the termination of formal treatment. The two-month follow-up was conducted during the final week of the school year. The 3.5 month follow-up was conducted during the subject's first day back in school following a 1.5-month summer recess. Each follow-up period consisted of one day's observation identical to baseline conditions.

RESULTS

Figure 1 presents the mean percentage of fifteen-second intervals in which tapping, rubbing, waving, and slapping behaviour was recorded, during each three-minute observational period, each day. During baseline, tapping and rubbing were displayed at moderately high frequencies (\( \bar{X} = 32.0 \) per cent and \( \bar{X} = 32.4 \) per cent, respectively), while waving and slapping were displayed at low frequencies (\( \bar{X} = 8.5 \) per cent and \( \bar{X} = 9.0 \) per cent, respectively). Upon introducing reinforcement procedures, tapping increased to a mean of 47.5 per cent while the other kinds of behaviour either decreased or remained at low levels (\( \bar{X} \) rubbing = 18.5 per cent, \( \bar{X} \) waving = 3.0 per cent, \( \bar{X} \) slapping = 0 per cent). Making overcorrection contingent upon tapping resulted in an immediate decrease from a mean of 47.5 per cent
to a mean of 4.5 per cent. During the overcorrection phase, frequencies of rubbing, waving, and slapping remained low at means of 9.8 per cent, 3.5 per cent and 0.10 per cent, respectively. When overcorrection was withdrawn with reinforcement remaining in effect for three days, tapping remained low at a mean of 1.1 per cent. The other forms of behaviour also occurred at low frequencies ($\bar{X}$ rubbing = 0.40 per cent, $\bar{X}$ waving = 0.40 per cent, $\bar{X}$ slapping = 1.5 per cent). Upon reinstating baseline conditions, tapping occurred at a mean of 0.40 per cent, rubbing at 4.5 per cent, and slapping at 3.3 per cent, while waving increased to a mean of 11.2 per cent. When reinforcement procedures were again introduced, all varieties of behaviour remained at low frequencies for the remainder of the study ($\bar{X}$ tapping = 1.40 per cent, $\bar{X}$ rubbing = 3.3 per cent, $\bar{X}$ waving = 5.7 per cent, $\bar{X}$ slapping = 5.5 per cent).

At the two-month follow-up phase, tapping was recorded in 5.9 per cent of the intervals recorded and rubbing was recorded in 1.1 per cent of the intervals recorded. Both waving and slapping failed to be exhibited. At the 3.5-month follow-up, none of the four types of behaviour was observed to occur.

**DISCUSSION**

Following baseline observations, an attempt was made to reduce the frequency of four stereotyped hand movements through reinforcement of an incompatible response. During the first four days of reinforcement, three of the four behaviour types decreased in frequency while the fourth increased (tapping). When overcorrection was made contingent upon this increased behaviour, it was immediately reduced in frequency while all the other behaviour types remained at low levels. Because of the observed decrease in the occurrence of three types of behaviour preceding overcorrection, it is possible that tapping might also have decreased as a function of reinforcement and not overcorrection. However, the reduction during the first four days of reinforcement might also be an artifact. During this time, the subject exhibited a fairly substantial increase in tapping, from a mean of 32.0 per cent during baseline to a mean of 47.5 per cent. It is possible that this increase simply ruled out the occurrence of the other varieties of behaviour and, hence, a decrease was recorded.

Several practical positive effects of the overcorrection procedure were demonstrated. First, each overcorrection episode lasted approximately one minute and, therefore, did not require a large investment of time by the teachers. This may be contrasted to overcorrection episodes of five minutes (Foxx and Azrin, 1973; Townsend and Marholin, 1978) and 2.5 minutes (Epstein et al., 1974; Wells et al., 1977) which are typically used. Second, the procedure was free of negative side-effects. During and following the use of overcorrection, none of the other three types of behaviour showed any systematic increase. In addition, no new problem responses were observed. Finally, the effects of overcorrection were lasting as revealed during 2- and 3.5-month follow-up observations.

When overcorrection was withdrawn, tapping and the other three self-
stimulatory behaviour forms stabilised at near-zero levels for the remainder of the study. Although this finding is difficult to explain, two interpretations may be offered. First, a reversal may not have been obtained due to the fact that teachers may have become conditioned discriminative stimuli for the application of overcorrection. Their presence alone may have controlled responding (cf. Marholin and Steinman, 1977). It is also possible that following overcorrection, the effect of reinforcement may have been enhanced. During the first four days of reinforcement the subject was only able to receive praise and edibles infrequently due to the high occurrence of tapping behaviour. With the implementation of overcorrection, this behaviour was reduced substantially, thereby allowing for more frequent reinforcement of the incompatible hands-on-lap-behaviour. This behaviour, therefore, may have been strengthened and effectively competed with the occurrence of self-stimulation.

The findings from this study, although limited to a single subject, indicate that positive practice overcorrection might be utilised effectively to control the self-stimulation of retarded children, particularly when reinforcement methods have previously failed. The fact that overcorrection can be applied for a brief period and yet lead to rapid and lasting results, without accompanying side-effects, makes it an extremely efficacious procedure for use by special classroom teachers. The combined use of a reinforcement/overcorrection contingency would seem to be a most productive approach for strengthening a competing response while simultaneously interfering with self-stimulation in a minimally aversive manner.

SUMMARY

The use of positive practice overcorrection to reduce the classroom self-stimulatory behaviour of a mentally retarded child is described. An initial attempt to reduce four stereotyped hand movements through reinforcement of incompatible behaviour resulted in a decrease in three types of behaviour and an increase in the fourth. When one minute of positive practice overcorrection was then made contingent upon the increased behaviour, it was immediately reduced to near-zero levels with accompanying low occurrences of all other behaviour forms. Response suppression was durable following the evaluation of the overcorrection procedure at 2- and 3.5-month follow-ups.

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