

CONTROL OF HYPERACTIVE BEHAVIOUR USING

A "TIMEOUT" APPROACH

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"hyperactive" behaviour is at present *the* major reason for referral in child practice (Ross & Ross, 1976). According to these authors, the term is applied to "a child who consistently exhibits a high level of activity in situations in which it is clearly inappropriate, is unable to inhibit his activity on command, often appears capable of only one speed of response, and is often characterized by other physiological, learning, and behavioral symptoms and problems" (p.12). However there is no universally acceptable definition, nor criteria of hyperactive behaviour. The term is aetiologically heterogeneous (*cf.* Ullman, Barkley & Brown, 1978). Its meaning may range from a child's natural exuberance to the "organic drivenness" of the brain-injured child. It includes all degrees of emotional disturbance inbetween. Yet hyperactive behaviour has been the subject of much research. Some findings suggest that the mean IQ of hyperactive children may not differ significantly from that of controls (Loney, 1974). Other findings suggest that the hyperactive child generally obtains lower IQ scores than do his peers (Ross & Ross, 1976). The older hyperactive child may develop antisocial behaviours in response to frustrated coping efforts, thereby compounding his problems (Cantwell, 1975). Some evidence suggests that an explosive personality in adulthood might result directly from childhood hyperactive behaviour (Morrison & Minkoff, 1975). Much controversy still surrounds these issues.

Physiological "explanations" and "treatments" which assume a dysfunction in the CNS (see Lambert, Sandoval, & Sassone, 1978; Millichap, 1978) are currently the focus of attention. For instance two recent papers reported success with the Feingold elimination diet in symptomatically suppressing hyperactive behaviour (Cook & Woodhill, 1976; Salzman, 1976), despite an obscure theoretical basis. Rigid application of the Feingold diet may result in vitamin C deficiency, along with serious nutritional imbalances (Werry, 1976). At the psychological level, the probable frustration encountered in adhering to the diet may add to the child's existing problems. In any event, a double-blind crossover study by Levy, Dumbrell, Hobbes, Ryan, Wilton and Woodhill (1978) indicated that the Feingold elimination diet had no significant effect upon hyperactive behaviour (in 22 four to eight year olds), as assessed on 13 out of 14 objective test measures of motility, attention, memory, and perceptual-motor performance. On the other hand, the drugs used in treating hyperactive behaviour (e.g., dexamphetamine, methylphenidate, or the tricyclic antidepressants) have the measurable side-effect of growth retardation (Friend, 1977).

In contrast to the organic model, hyperactive behaviour might be seen as a product of the child's social environment (*cf.* Conrad, 1975; Robin & Bosco, 1976). Moreover Lambert et al. (1978) argued for a multidimensional model, whereby hyperactive behaviour results from a complex interaction between the child's environment and his physical and psychological status. Regardless of aetiology, behaviour

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modification techniques may be equally, if not more appropriate, in many instances. A timeout from positive reinforcement (TO) program might diminish hyperactive behaviours. A number of investigators (e.g., Birnbrauer, Wolf, Kidder, & Tague, 1965; Bostow & Bailey, 1969; Burchard & Barrera, 1972; Clark, Rowbury, Baer, & Baer, 1973; Firestone, 1976; Hamilton, Stephens, & Allen, 1967; Leitenberg, 1965; Ramp, Ulrich, & Delaney, 1971; Tyler & Brown, 1967; Wahler, Winkel, Peterson, & Morrison, 1965; White, Neilson, & Johnson, 1972; Wolf, Risley, & Mees, 1964) have reported the efficacy of TO in decreasing aggressive and maladaptive behaviours (see MacDonough & Forehand, 1973, for a review). There is evidence however that TO may have no effect (Risley, 1968), or a reinforcing effect (Steeves, Martin, & Pear, 1970; Plummer & LeBlanc, Note 1). Hence Solnick, Rincover, and Peterson (1977) investigated some determinants influencing the reinforcing and punishing effects of TO. In two experiments, they concluded that the effectiveness of TO was relative to the impoverishment of the "timein" setting. According to them,

"When the timein setting was 'impoverished', the timeout was ineffective as a punisher and, in fact, seemed to serve as a negative reinforcer. When the timein setting was 'enriched', the same timeout procedure functioned effectively as a punisher" (p.421).

Even if successful, no conclusions can be drawn as to the origin of the hyperactive behaviours. The present paper presents some preliminary findings using a TO approach on a group of hyperactive children, in an Australian context.

METHOD

Subjects

The 11 primary school children were all males aged between 5 and 10 years. There were two classes each with a separate teacher. The older class contained four children aged between 8 and 10 years. The younger class consisted of seven children between 5 and 7 years of age. All children had been assessed as hyperactive using the criteria of Cantwell (1975)--*cf.* Levy et al. (1978). Moreover in each case, the parents reported that they regarded their child as being hyperactive. This label had also been attached to each child by his respective class teachers. As well, prior to referral to the special education centre, in almost all cases a medical practitioner had diagnosed the child as hyperactive. Some descriptive details of this group are presented in Table 1.

Table 1
Descriptive Characteristics for the Group
of Hyperactive Children

	<i>Range</i>	<i>M</i>	<i>SD</i>
Age (years)	5 - 10	8.4	1.7
WISC-R Digit Span (scale score)	2 - 11	5.2	2.4
WISC-R IQ--Verbal	55-124	84.7	16.2
--Performance	61-117	87.3	13.7
--Total	54-123	84.8	16.0

The low mean digit span scale score suggests a generally low attention span amongst the children. This concurs with previous findings amongst hyperactive children (*cf.* Ross & Ross, 1976). According to

Cruickshank (1975), distractibility is a main contributor to learning difficulty with the hyperactive child. IQ scores were obtained after about three weeks of TO therapy had been administered. This minimized poor performance on the Wechsler Intelligence Scale for Children (WISC-R). Whilst the mean IQ score lay within the dull normal range, some of these children exhibited well above average intelligence. Also 70% of them exhibited specific learning disabilities (assessed via the Revised Illinois Test of Psycholinguistic Abilities). A difference between the mean scale score and a subtest scale score of 10 or more points implied a specific learning disability. The most frequent disability was inadequate visual sequential memory (46% of cases), which might have been related to the low attention span, and which might have been largely responsible for the childrens' poor educational attainment. This was followed by auditory closure problems (23% of cases). As well 30% of the children exhibited neuromotor dysfunction (assessed via the Test of Motor Impairment--Stott et al., 1972). An impairment index of 6 or more points implied neuromotor dysfunction.

In most cases the hyperactive behaviours commenced in the first year or two of the childrens' lives. Inadequate parenting (e.g., maternal deprivation; absence of the father in the home) and subtle emotional factors (such as the mother's psychological stability) appeared aetiologically critical. These observations were made via the Family Relations Test--(Bene & Anthony, 1976), in conjunction with parent interviews. Both at school and at home these children were unmanageable. Pretreatment levels of disruptive behaviours were extremely high. For instance, one particular child could not remain seated at his desk. He constantly was running around the room, walking on top of desks, pulling at the curtains, opening and closing the blinds, swearing, and generally fidgeting with objects. The disruptive behaviours of the other children were similar, with the addition of exposing themselves in an attempt to disgust the female teachers, although the symptom of hyperactivity *per se*, was less intense and frequent. When first placed in the special school, about 80% of the time was wasted with such disruptive behaviours on the part of the children. All of them had long medical and/or psychiatric treatment histories, but their hyperactive behaviours had persisted.

Procedure

The hyperactive behaviours eliciting intervention included: (i) failure to remain seated in the classroom (after the teacher had specifically requested the child to sit down). (ii) calling-out or interrupting the teacher and children so as to disrupt the class. (iii) failure to inhibit behaviours when specifically requested by the teacher. (iv) failure to inhibit aggressive or violent outbursts in the classroom. Failure to concentrate on a learning task for a period of time specified by the teacher (which was gradually increased from day to day) also resulted in the child being put in TO. This served as a means of attention conditioning whereby the removal of the threat of TO acted as a negative reinforcer. When a given child exhibited any of these behaviours he was placed immediately in the TO room without any discussion on the part of the teacher (*cf.* Bandura, 1969, p.341). The TO room comprised a rectangular area about 2 metres in both length and breadth. It was made from solid woodboard, with two external bolts on the door. One-way "peepholes" were located in adjacent walls such that the child in TO could be observed by a supervising adult. The TO room was open at the top (about 2.5 metres high), which allowed light from a nearby window to keep the TO room well illuminated. All objects were removed from the child's pockets prior to his placement in TO. The childrens' shoes were removed at the

commencement of the school day, thereby minimizing the consequences of kicking either the adult implementing TO, or the TO door itself. The child remained in TO until all maladaptive behaviours had ceased. The behaviour prompting release was complete silence on the part of the child for at least five minutes. Only then was he allowed to rejoin his peers in the classroom. In TO the child's maladaptive behaviours could not be reinforced, and they gradually diminished in both frequency and duration throughout each TO session.

Parents were trained to implement the TO procedure by the psychologist at a parent-training session held on one evening, not long after the children had been placed in the special school. This session took the form of a lecture/discussion wherein the parents were given a brief and simplified account of operant conditioning and extinction. It was pointed out that whilst the child remains in the classroom, the teacher cannot avoid reinforcing the child's hyperactive behaviours. Even if she tries to ignore such behaviours, subtle cues such as slight signs of frustration could inadvertently reinforce the hyperactive behaviours. The analogous situation within the home environment was also discussed. Parents were given log-sheets to take home, in which they could enter their child's times of entry and release from the home TO room. Parents were advised as to the setting-up of a TO room within their homes. Teachers had been given similar training sessions on a number of prior occasions.

Parents were instructed to use similar criteria for implementing TO in their homes. These criteria were: (i) failure to remain seated in either the kitchen or lounge when specifically requested by the parents. (ii) failure to inhibit obstreperous or hyperactive behaviours when specifically requested by the parents. (iii) failure to inhibit aggressive or violent outbursts in the home. (iv) failure to respond to a parental directive (such as to do one's homework).

The log-sheet data (recorded by both parents and teachers) provided information as to the frequency and duration of each child's TO sessions. Unfortunately parents sometimes forgot to make an entry in the log-sheet. Hence whilst the reliability of teacher entries was satisfactory, that for parents was not good. Previous research (e.g., Frazier & Schneider, 1975) has shown the efficacy of training parents to implement a TO approach in modifying hyperactive behaviour. Evaluation of the performance of parents and teachers as agents of intervention was based on: (i) weekly case conferences amongst staff. (ii) frequent interviews (every two or three weeks) between psychologist and parents. In each case graphs of the frequency and duration of each child's TO sessions were discussed in order to provide data on the efficacy of the TO program. Parents and teachers were able to support each other mutually. Often they were in daily communication with each other. The most often experienced difficulties were: (i) lack of consistent administering of TO. (ii) failure to leave the child in the TO room until he was silent. (iii) tendency to communicate with the child whilst he was in the TO room. These difficulties were minimized by discussion with the psychologist, and by support from the social worker who regularly visited each child's home.

As for differential reinforcement procedures, the children were rewarded in various ways (e.g., social reinforcement such as praise, or material reinforcement such as being allowed out to play in the playground) for socially acceptable behaviours. However these instances of positive reinforcement were often ineffective (according to the teachers), who came to rely on the TO procedure since it reduced

their immediate stress, and since it appeared to control the childrens' behaviour effectively (see Results section).

RESULTS AND DISCUSSION

It might be argued that extinction of teachers' and parents' use of TO occurred rather than any reduction of the childrens' hyperactive behaviours. However both teachers and parents were monitored regularly in their use of TO to ensure that such a possibility did not occur. Observation of a parent's handling of his or her child prior to instituting TO, often suggested that the parent unwittingly reinforced the child's hyperactive behaviours (e.g., by becoming frustrated and retributing the child-- such increased attention from the parent might have operated as a positive reinforcer). In order to summarize the effectiveness of TO for the combined group, the number of children still receiving TO after various intervals of time is presented in Table 2.

Table 2

Number of Children Receiving TO
After Various Intervals of Time

<i>Months</i>	<i>No. of Children</i>
1	11
2	10
3	6
4	4
5	3
6	1

As is evident, 90% of the children had ceased completely to receive TO after six months of treatment. Half of these had their TO discontinued after only three months, although this applied to only the younger class. TO was ceased when the frequency of targeted behaviours had decreased to such a level that both teachers and parents *conjointly* were satisfied that these behaviours no longer posed a threat in either the school or the home environment. None of these children have since required any additional TO therapy. In order to analyse these findings in more detail, the mean frequency and duration of TO for each child receiving TO after various intervals of time is presented in Table 3.

Table 3

Mean Frequency and Duration of TO
Each Month

<i>Month</i>	<i>Mean No. of Sessions</i>	<i>Mean Duration (mins.)</i>
1	19	78
2	8	66
3	6	36
4	4	24
5	3	18
6	3	15

Note. Data presented are for the school context only, since parent data was unreliable.

Since there were no control subjects available (it would have been unethical to deny some of the children any possible advantage to them of receiving TO), it might be argued that such improvement was due to the "settling down" process occurring with the normal school routine and discipline. Yet the only form of "discipline" exerted by the teachers and parents was TO. It seems unlikely that the hyperactive behaviours diminished for any other reason than that due to the effects of TO. This seems particularly so for the older children whose hyperactive behaviours had gone on for a long time, and which previously had been resistant to other forms of treatment such as medication, dietary restrictions, or play therapy. For those children who responded most rapidly, the mean duration of TO initially was considerably longer (at least an hour) than for those who responded more slowly. For one such child, his first TO session lasted 105 minutes, and his second session 137 minutes respectively. His third session dropped markedly to only 25 minutes duration. The single child who was still receiving TO after six months had undergone many TO sessions, albeit all of short duration (approximately 15-20 minutes each). Reports describing the use of TO in clinical settings generally support the use of moderate or prolonged TO periods, with longer TO sessions usually resulting in greater reduction of targeted behaviours (e.g., Burchard & Barrera, 1972; Foxx & Azrin, 1972; White, Nielson, & Johnson, 1972).

Since the classrooms in which the children were being taught were "enriched", being decorated in multi-colours, and containing numerous teaching aids and instructional materials, it is clear from Solnick et al. (1977) that TO operated as a punisher in the present study. Had the classrooms been "impoverished", then TO would not have been effective in diminishing the childrens' hyperactive behaviours. These findings support the assertion by Solnick et al. that, "enriching the timein environment may be a powerful tool in planning an effective (punishing) timeout procedure" (p.423).

Removal from the TO room probably operated as a negative reinforcer, involving a continuous schedule of reinforcement (since the child was always released from the TO room when he had remained silent for 5 minutes consecutively). Since this schedule produces a high response rate (see Calhoun & Matherne, 1975), this may partially account for the present success with TO in eliminating hyperactive behaviours. That the reduction in implementation of TO was not an artifact due to inconsistency in teacher administration, was clearly suggested when virtually all of the children were returned to normal schools the following year. All of these children were now manageable, when prior to their placement in the special school, their behaviour was completely out of control. The alternative that TO operated as a positive experience whereby the child could reintegrate himself emotionally seems unlikely, as indicated above. This "positive experience" hypothesis was unsupported since the intensity of maladaptive behaviours often increased initially during the time when the child was placed in the TO room. The possibility of psychological harm arising from the child's frustration during the TO sessions was probably minimized in view of the apparent reinforcement associated with his "quiet" behaviour and subsequent release from the TO room. Nevertheless the "positive experience" view assumes that hyperactive behaviour involves heightened CNS arousal. Stimulant medication studies (see Friend, 1977) suggest that cortical hypoarousal is characteristic of many hyperactive children. The TO procedure utilized in the present study involved social restriction, not sensory deprivation as such (cf. Zuckerman, 1974; Zuckerman, Persky, Link, & Basu, 1968). The room was well exposed to light and it was not soundproof. It did however restrict visual perusal of external activities. Had TO significantly decreased CNS arousal,

then the present success with the method implies that the children in this sample were not "hypoarousal" cases. Indeed none of these children had responded favourably to stimulant medication, as ascertained prior to their being admitted to the special school.

Since the TO intervention apparently decreased the hyperactive behaviours of these children, recourse to treatment modalities such as diet or medication may be unnecessary. Future studies with appropriately matched control groups would provide more conclusive evidence on this point. In practice, however, it is difficult to obtain such matched control groups in a special school context, since it would seem unethical to refuse treatment to certain hyperactive children. In the present study, there was no point in conducting a multiple-baseline or reversal design, since it was quite clear that the incidence of hyperactive behaviours both at home and at school had dropped sharply from at least 80% of the time, to virtually 0% of the time in every case except one. There was no doubt as to this fact, since *everyone* concerned with the management of the children was unanimous that this was so. Certainly the present findings suggest that TO might be applied effectively within the context of a task-oriented group extended to the home context. As a condition of entry to the program, all drug administration for the control of hyperactive behaviours was ceased. Moreover none of the children was on dietary restrictions. Hence *none* of the success found in eliminating the hyperactive behaviours could be attributed to carryover effects of either diet or medication. The alternative that the removal of drugs or diet may have been responsible for the decrease in hyperactive behaviours seems unlikely in view of their popular usage. Clearly application of the behavioural approach to the elimination of hyperactive behaviours seems worthy of further investigation, in view of the present encouraging findings. This desirability for further investigation seems particularly important in the Australian context, where the emphasis is still on physiological "treatments".

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