

## Treatment of Self-Injurious Behaviour: A Three Year Follow-up

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This study was designed to assess the effectiveness and durability of behavioural treatment procedures in the suppression of self-injurious behaviour in mentally retarded children. Six children who had been successfully treated with a multi-element treatment programme were observed yearly, for three years. The results showed complete response suppression in two of the subjects and a near-zero frequency of self-injurious behaviour in another three. The other subject had died, through natural causes, after the first followup. This study indicated that the long-term suppression of self-injurious behaviour in the mentally retarded can be achieved by the use of multi-element treatment programmes.

The term self-injurious behaviour (SIB) is most commonly used to refer to any self-inflicted repetitive action which leads to lacerations, bruising, or abrasions of the patient's own body. These repetitive actions include head-banging, eye-gouging, biting of extremities, and skin-picking. The most effective treatments of SIB have usually included some form of punishment, with the typical procedure involving the use of response-contingent aversive stimuli such as electric shock or aromatic ammonia. Other treatments have included extinction and the differential reinforcement of other incompatible behaviours. However, the most efficient method of elimination involves the use of a treatment package which combines reinforcement with effective punishment of SIB (Bachman, 1972).

The purpose of the present study was to assess the effectiveness and durability of behavioural treatment procedures in the control of SIB over a 3-year period.

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Essentially, this paper reports a three-year followup of six mentally-retarded persons whose self-injurious behaviours had been successfully treated through a combination of behavioural techniques.

### Method

#### *Subjects*

The subjects were six mentally-retarded children who were resident at the Mangere Hospital and Training School, a state psychopaedic institution for the mentally retarded, when they were first treated for self-injurious behaviours. All were successfully treated using behavioural techniques. A summary of the subject characteristics is presented in Table 1. Of the six subjects, two (Andy and Barry) had been discharged following the initial treatment and post-treatment followup. Carl died (through natural causes) seven months after the first followup.

#### *Procedure*

In all cases the initial treatment had been carried out in the residential unit where the subject lived. The particular treatment programme used in each case is summarized in Table 2.

The rate of SIB during baseline and post-treatment for each subject was obtained from the original studies (Jones, Singh, White & Astwood, 1977; Singh, 1976, 1977; Singh & Pulman, 1979). Observational data for the followups were obtained at yearly intervals, for three years, on all subjects. A psychologist or ward nurse trained in behavioural techniques collected the data on five consecutive days for each subject during each followup. They used the same operational definitions and observation procedures as used in the original studies. For the three subjects (Denise, Edward and Fred) who were still resident at the institution the conditions under which the

Table 1  
Subject Data at Time of Initial Treatment

Study	Subject*	Sex	Age (yrs)	Diagnosis	Topography of behaviour	Pretreatment history of SIB
Singh (1976)	Andy	M	6.5	severely retarded due to Down's Syndrome	eye poking	over 2 yrs
Singh (1976)	Barry	M	2.5	moderately retarded due to cerebral birth damage	head banging	about 1 yr
Singh (1977)	Carl	M	11.5	severely retarded due to Down's Syndrome	skin picking	about 4 yrs
Singh (1977)	Denise	F	14.4	severely retarded due to encephalitis at 14 mths	head banging	about 6 yrs
Jones, Singh, White and Astwood (1977)	Edward	M	3.8	severely retarded due to Down's Syndrome	hair pulling	about 1.5 yrs
Singh and Pulman (1979)	Fred	M	13.0	severely retarded due to de Lange syndrome	head slapping	over 3 yrs

\* Code names have been used

followup data were collected were approximately the same as those under which the SIB occurred during baseline.

An interval recording procedure was used to collect data in 10-sec intervals over 30 minute sessions. The observer was seated in an inconspicuous position (or behind a one-way mirror) equipped with a timer that signalled through earphones the end of successive 10-sec periods. On each signal the observer recorded the number of self-injurious responses since the previous signal. Interobserver agreement was assessed during 20 per cent of the observation sessions by a second observer, who concurrently and independently observed and collected data. Agreement checks were 30 min in duration. An agreement was scored for an interval if both observers recorded the same number of SIB responses for the interval. The interobserver agreement was determined by dividing the number of agreements on an interval-by-interval basis by the total number of agreements multiplied by 100. There was a 100 per cent agreement between the observers, mainly because of the discrete

nature of the responses observed and their low frequency of occurrence.

### Results

Table 3 presents the baseline, post-treatment and followup data for the six subjects. The followup data show that for two of the subjects (Barry and Fred), suppression of SIB was maintained at zero-levels over the three-year period. The rate of SIB in the other subjects (Andy, Denise and Edward) was maintained at near-zero levels, showing a therapeutically significant result. However, there is a slight trend in the data showing a gradual increase in the rate of SIB over time for the subjects.

Our case notes show that Andy, who had been discharged following the post-treatment observations, was admitted to the hospital twice for two-week sessions of "booster treatments" (Hersen, 1979). The mean baseline rate during the first two-week admission (6

Table 2  
Summary of Treatment Procedures Used with Each Subject

Study	Subject	Treatment
Singh (1976)	Andy	Physical punishment (a sharp tap on the fingers), differential reinforcement of other behaviours
Singh (1976)	Barry	Verbal reprimand ("No, don't do that"), time-out 1-min, differential reinforcement of other behaviours
Singh (1977)	Carl	Verbal reprimand ("No, don't do that") punishment (a sharp tap on the fingers) physical restraint (30-sec) differential reinforcement of other behaviours
Singh (1977)	Denise	Noncontingent attention
Jones, Singh, White and Astwood (1977)	Edward	Verbal reprimand ("No, don't do that") punishment (a sharp tap of the fingers) physical restraint (30-sec) differential reinforcement of other behaviours
Singh and Pulman (1979)	Fred	Verbal reprimand ("No, don't do that") punishment (a sharp tap on the fingers) differential reinforcement of other behaviours.

Table 3  
*Numbers of Self-Injurious Responses per Minute*

Study	Subject	Baseline	Post-treatment	1 yr Followup	2 yr Followup	3 yr Followup
Singh (1976)	Andy	4.00	0	0.13	0.15	0.2
Singh (1976)	Barry	0.21	0	0	0	0
Singh (1977)	Carl	4.42	0	0	—*	—*
Singh (1977)	Denise	6.32	0	0	0.5	0.3
Jones, Singh, White and Astwood (1977)	Edward	3.52	0	0	0.01	0.3
Singh and Pulman (1979)	Fred	0.70	0	0	0	0

\* Deceased

months after discharge) was 2.53 SIB responses per minute and required six days of treatment time. The mean baseline rate during the second admission (3 months after the first long-term followup) was 0.13 SIB responses per minute and required three days of treatment to suppress it. Several such admissions were planned for this subject but the child was not brought in for maintenance training.

#### Discussion

The present results provide a very clear demonstration of the effectiveness of multi-element behavioural treatment programmes in the control of SIB over extended periods of time. Because of the nature of the treatment strategy used (i.e., a treatment package which itself had multiple components) with five of the six subjects, the controlling effects of individual components could not be directly assessed. The basic question posed by our original series of studies was "can this treatment suppress the occurrence of SIB to therapeutic levels?". That the treatment strategies worked in all cases, regardless of the temporal and topographical differences between the SIBs of the subjects, demonstrates the degree of control exerted by such a procedure. However, only a dismantling of the treatment procedure (Kazdin, 1979) will reveal which aspects of the treatment package exerted the greatest control over the SIB. With two subjects (Carl and Fred) a constructive treatment strategy (Kazdin, 1979) had been used for the original treatment. This allowed the addition of a new component (punishment) to enhance the effectiveness of the existing treatment procedure.

A significant factor in the long-term maintenance of treatment gains is its transfer or generalization to the subject's natural environment (Marholin & Siegel, 1979). In the present study, two techniques were used to ensure the maintenance of treatment gains.

Booster treatment sessions were programmed for one subject (Andy) and generalization to the home environment was programmed for Barry by training his mother in behavioural techniques. For the institutionalized subjects, generalization was established by scheduling the treatment in the subjects' own residential wards and instructing the ward staff to arrange appropriate social contingencies which would maintain the treatment gains over time.

In the treatment of self-injury, there is a plethora of studies which report short-term followup data on the maintenance of behaviour change after the termination of the formal treatment programme (e.g., deCatanzaro & Baldwin, 1978). With a few exceptions (e.g., Muttar, Peck, Whitlow & Fraser, 1975), the followup interval has been measured in terms of a few weeks, a period too short to be meaningful since SIB tends to fluctuate in occurrence and intensity over time. In contrast, the present study demonstrated that substantial maintenance of response suppression can be achieved over an extended period of time.

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