

MODIFICATION OF SELF-INJURIOUS BEHAVIOUR IN A PROFOUNDLY RETARDED CHILD BY DIFFERENTIALLY REINFORCING INCOMPATIBLE BEHAVIOUR

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Self injurious behaviour (SIB) is one of the most extreme manifestations of human psychopathology. SIB which can take a variety of forms, has been defined as behaviour producing physical injury to the individual's own body (Tate and Baroff, 1966). The problem is known to occur both in normal children (De Lissovoy, 1961; Freud, 1973), emotionally disturbed children (Green, 1967) and children with severe intellectual deficits (MacKay, McDonald and Morrissey, 1974). In their review of the literature on the prevalence of SIB, Baumeister and Rollings (1976) conclude that the prevalence of SIB amongst normal babies is around 7%, that the problem occurs more frequently amongst psychiatric patients, particularly schizophrenic children and that the lower the I.Q. the more frequent and severe these behaviours tend to be. They also note that SIB is often accompanied by other abnormal behaviours including motor and verbal stereotypes such as body rocking and screaming.

Although many different methods have been attempted in the treatment of this problem, including forms of physical restraint, the use of tranquillising drugs and various forms of supportive psychotherapy, the only procedures which have produced consistently favourable outcomes are those based upon learning principles. There is now a growing body of research which indicates that techniques of behaviour modification are useful in controlling the rate and intensity of SIB in children. A variety of behavioural techniques are available. Baumeister and Rollings (1976) group these into three categories on the basis of their major contingencies: (1) differential reinforcement of other behaviour. (2) removal of positive reinforcement and (3) punishment.

Of all the behavioural procedures currently available the establishment of other behaviours by positive reinforcement should be the treatment of choice for the problem (Smolev, 1971). The technique presents few ethical problems and it concentrates on teaching the child more acceptable behaviours in addition to eliminating the self-injurious acts. In the procedure the therapist ignores instances of the SIB and reinforces the patient for engaging in incompatible alternative or socially more acceptable responses.

Although a number of studies suggest that the reinforcement of alternative behaviours when combined with other procedures is successful in controlling self-injurious behaviour (Allen and Harris, 1966; Peterson and Peterson, 1968; Bostow and Bailey, 1969; Measel and Alfieri, 1976), only a handful of studies have compared this technique with other established procedures or investigated its utility as the sole method of treatment. Here the results have not been too promising.

A series of studies by Lovaas *et al.* (1965) demonstrated that reinforcement and extinction of behaviours other than SIB controlled the severity of SIB in a schizophrenic child. However this contingency was applied for only a short period of time and involved a restricted range of alternative behaviours. A study by Weiher and Harman (1975) successfully used omission training to reduce the self-injurious behaviour of headbanging in a severely retarded 14 year old boy with a long history of the problem.

Other studies however report that this method increased SIB and aggression in four retarded children and only moderately decreased these behaviours in another child (Herbert *et al.*, 1973).

Comparative studies suggest that the differential reinforcement of other behaviour has no effect or is at least only moderately effective compared with other procedures (Peterson and Peterson, 1968; Corte, Wolfe and Locke, 1971; Foxx and Azrin, 1973; Measel and Alfieri, 1976) and may be difficult to implement due to the high frequency of self-injurious acts (Wolf *et al*, 1967) or to lack of trained personnel (Bucher and Lovaas, 1968). There is then little convincing evidence that the DRO schedule alone has clinical utility in the management of self-injurious behaviour.

In the present study a DRO schedule was employed to modify high frequency self-destructive headbanging in a multiply-handicapped child in a hospital setting.

METHOD

Subject

The subject Paul was 13 years 7 months old. He had been institutionalised for 9½ years. As a baby Paul had failed to develop normally and was found to have spasticity in all four limbs. At 189 weeks of age he obtained a Developmental Age of 17-18 weeks on the Ruth Griffiths Developmental Scale. At the time of the study Paul manifested gross intellectual deficits and required almost total nursing care. He was able to stand but unable to walk unaided and was confined to a wheelchair or to his bed for most of the day.

Paul's most serious management problem was his severe self-injurious behaviour. He hit his head with both fists sometimes in excess of 100 times per minute unless restrained. His head and facial areas were now extremely soft. He had multiple scars. The history of the problem was not well documented. Soon after his admission to hospital Paul developed an ear infection. The headbanging seems to have commenced around this time.

Procedure

An ABAB design was employed to permit the subject to serve as his own control.

Baseline

During the baseline, observations were made of Paul's headbanging behaviour whilst seated in a chair in the day-room of the ward in which he normally resided. No attempt was made to interact with Paul whilst the baseline data was collected. A one day baseline of ten random one minute samples during a 45 minute observational session, was undertaken.

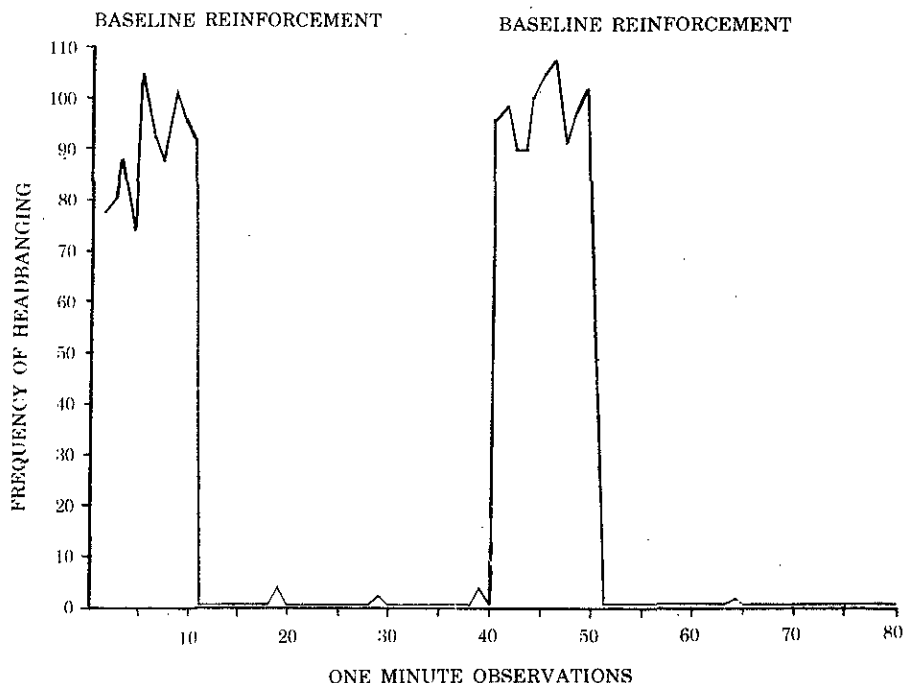
DRO Contingency

Paul was strapped into an upright mobile walking frame, leaving his hands free. He was taught to propel himself in the walking frame by prompting and fading techniques and reinforced for doing so by tactile and verbal reinforcement. In order to propel the walking frame Paul had to grasp the horizontal bar of the walking frame, with both hands and push his left foot against the floor. Mobility in the walking frame was incompatible with headbanging. Incidents of headbanging were ignored during the treatment phase. A three day treatment phase was initiated, one treatment session per day. Paul's behaviour was observed and noted during a random sample of ten one minute periods each session.

RESULTS

An observer recorded the number of head bangs occurring in each observation period. A second observer was present throughout the baseline period. Inter observer agreement was 90%. Percent agreement was obtained by dividing the number of intervals in which two observers agreed by the total number of intervals in which observations were made, times 100.

FIGURE 1.
**FREQUENCY OF HEADBANGING DURING BASELINE AND
 TREATMENT PERIODS**



As Figure 1. indicates the baseline frequency of head bangs ranged from 75 to 105 per minute ($X=89.4$). The DRO schedule was instituted on the second day. During the first three days of treatment the frequency of head bangs ranged from zero to 6 per minute ($X=0.5$). Withdrawal of the contingency resulted in a return to baseline frequencies of headbanging, ranging from 90 to 105 per minutes ($X=96.6$). Reinstatement of treatment yielded near zero levels of headbanging which continued for the last three days of treatment and for a further thirty days over which non-systematic observations were maintained and during which the DRO procedure was used more extensively. Follow-up 18 months later indicates that ward staff have persisted in encouraging Paul's mobility behaviours and in addition have taught him to operate a wheelchair. Self-injurious behaviour has been completely eliminated from Paul's behavioural repertoire. Paul is now manifesting a range of play behaviours and has integrated successfully into the hospital school environment which had not been possible before the treatment programme commenced.

DISCUSSION

It is unwise to draw too many conclusions on the basis of a single case. However it is appropriate in this instance to consider those factors at work in this study which may have contributed to its success which have not been present in other studies.

The literature suggests that the DRO strategy has a number of variations based upon the nature of the alternative behaviour to be reinforced. In some studies no specific

alternative behaviour is specified (ommission training). The patient is reinforced contingent upon the absence of SIB during a specified time interval. The patient's progress is measured in terms of a reduction in SIB irrespective of alternative behaviours performed (e.g. Weiher and Harman, 1975).

In other studies a specified other behaviour is reinforced but this behaviour is not incompatible with performance of the SIB (e.g. Measel and Alfieri, 1976). Finally there is a small group of studies, of which the present study is one, in which the alternative behaviour to be reinforced is incompatible with performance of the SIB.

As yet the comparative efficacy of reinforcing incompatible behaviours (DRI), a specific other behaviour or all behaviours other than the target behaviour, has received virtually no attention. However, Young and Winzke (1974) suggest that the incompatibility of the response to be reinforced is a relevant variable and in a recent study Tarpley and Shroeder (1979) indicate that when DRO and DRI are compared, reinforcing a specified incompatible behaviour suppressed SIB more rapidly than applying DRO without specifying an alternative response.

In addition to utilising a DRI contingency the present study gave particular attention to the functional consequences for the patient of the incompatible behaviour to be reinforced. Previous studies with the DRI contingency have used behaviours which while serving to illustrate the efficacy of the procedure, are in themselves trivial, cannot be sustained over long periods and have no developmental or functional consequences for the patients involved in the studies.

In this study a child with minimal mobility skills was taught to use a walking frame a skill which at once enhanced his developmental potential and was incompatible with the self-injurious behaviour which first brought him to our attention.

The aetiology of SIB is a matter of some dispute (Carr, 1977). However the literature does suggest that SIB and other stereotyped behaviours are prone to occur in individuals restricted in their mobility (Levy, 1944; Dennis and Najarian, 1957) and/or residing in relatively unstimulating environments (Berkson and Davenport, 1962; Berkson and Mason, 1963, 1964). Hence it is suggested they serve as a means to providing the organism with a level of stimulation not otherwise available.

In so far as increasing independent mobility behaviour in an erstwhile immobile child increases the level of vestibular and kinaesthetic stimulation and enables that child to initiate interaction with persons and situations which have hitherto been beyond his reach or available only on the initiative of others, so the motivation to generate stimulation through self-injurious activity is reduced. Furthermore, independent mobility behaviour once established is highly likely to be reinforced and maintained in the child's natural environment and sustained indefinitely.

In conclusion this study suggests that the efficiency of the DRO procedure in the treatment of SIB may be enhanced if the alternative behaviour to be established is incompatible with the offending response and has functional consequences for the patient's behavioural development. In this instance the behaviour chosen could be sustained over long periods, resulted in a increased level of environmental stimulation potentially available to the patient and was readily maintained in the patient's normal living environment and generalisable to other settings.

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