EFFECT OF OPERANT CONDITIONING IN AN ATHETOID FOR IMPROVING DEXTERITY

VIDYA HOSAKOTE*

Operant conditioning procedures have been applied to improve verbal expression of non-verbal children, aphasics, (Kerr, *et al* 1965, Dembros 1966), elective mutism cases, stutterers and schizophrenics to improve work skills (Girerdean and Spradlin, 1964, Bensberg, 1965, etc.)

The application of such techniques to the mentally sub-normal has aroused considerable interest recently. Quite a number of mentally retarded, may have other problems as well and cerebral palsy is one such condition. Denoff (1960) defined cerebral palsy as a set of impaired neurological disturbances consequent to cortical and or sub-cortical lesions. It is a persistent but not unchanging disorder of posture movement due to dysfunction of the brain. One of the types of cerebral palsy is athetosis which is characterized by involuntary muscular activity (twisting, writhing movement). They have poor motor coordination. All these conditions impose tremendous problems when such a child has to do some purposeful movement or manipulation, like picking up objects, writing or aiming at a target (Garmezy, Harris). According to Haphens, Catlin 92 per cent of cerebral palsy children have some type of arm involvement.

The factorial composition of psychomotor test was significantly altered as a function of practice according to Bleishmm and Hampel (1954). King (1954) showed that assumption was not proved even with regard to simple tasks like tapping and dexterity. As regards the clinical group, they may perform initially at a very low level compared to normal controls, but may show a higher rate of learning and as a result their final level of performance may become much closed to the control.

In order to study whether operant procedures help in motor training, in the present study a multiple handicapped child with poor motor function was subjected for a short spell.

Methodology

Single case study technique was used. The subject was a male cerebral palsy case of about 8 years, of athetoid type with bilateral high frequency hearing loss

• Ms Vidya Hosakote, M.Sc, Lecturer in Speech Pathology, All India Institute of Physical Medicine and Rehabilitation, Bombay.

and having a vocabulary of 60 words. IQ was 39 on Columbia Mental Maturity-Scale. He had pooi motor co-ordination and involuntary movements of the limbs.

Plan was to subject the child to different aspects of operant procedure based on ABA design in order to develop better perceptual motor skills namely matching of forms and colour in order to prepare the child for speech therapy and auditory training. But, as the child developed viral infection, the study was discontinued after a preliminary study.

Procedure

The study was conducted in the therapy centre 6f All India Institute of Speech and Hearing clinic situated at Krishnarajendra Hospital in Mysore. The subject was seated on a small chair in front of a small table. The material for motor task was kept within reach. Instructions to the subject was to keep the blocks (in Kannada) indicating the place and demonstrating that the blocks to be kept as required. The investigator sat by the side of the child to be able to hold the child, if necessary and to supply the reinforcement easily to the child and observe child's behaviour.

A single case model 'ABA' design is used. They are three successive segments of the study. The first' A' refers to the base rate session. In this case, it was two sessions of ten minutes duration on successive days wherein the child's level in the motor function under study was noted in terms of number of blocks placed at the end of one minute.

The next session namely ' B ' consisted of the experimental session, where the child's performance/behaviour was recorded as was done in the first base rate session. In addition, there was a schedule of reinforcement introduced. Here the average performance was worked out on the basis of base rate session in terms of the number of blocks placed as required by the experimenter. It was found to be 8 and with that number of the lowest range, a fixed ratio schedule was worked out and as a result whenever the child could place 8-11 or more blocks in a period of one minute, the target being 8 and 8+ behaviour. There was a ringing of the interval timer which indicated that a reinforcement was to be supplied and immediately sweets in the form of two tiny, pieces of sweets which could be eaten by the child quickly.

Experimental sessions were on five successive days, each of ten minutes duration. At the end of the session, another segment ' A' started on the next day. Here the same procedure was followed. This was done on the seventh day or the last day of the study. Behaviour was subjected to behaviour analysis and the scores are compared. Here the number of blocks kept in each minute was recorded with variation. At no point the reinforcement was introduced. Any other behaviour, if there was' any, was also recorded.

Material used for motor task

Minnesota Rate of Manipulation Board was used. In this study the middle range of twenty perforations only was considered and the rest of the board was covered with card board. In case there was a fall of one of these blocks from the prescribed position or going out of reach, the child was asked to go to next block and in the meanwhile a block was replaced.

Behavioural observation: Subject became more interested in the task.
Events during the study:

1. other cases at times used to interrupt (as the study was done as a part of therapy programme),

2. subject had a fall after the third session,

3. there was a gap between third and fourth session till the child could come for therapy (after the said fall),

4. time was taken up by the child to eat the sweets (reinforcement),

5. only one Base Rate at the end of the session could be undertaken and further aspects of study could not be carried as the child developed chicken pox and later the child was not available for study.

Results and Discussions

The Table 1 indicates that there has been significant improvement in the task when the two Base Rate conditions A and A^1 are compared indicating the effect of operant procedure on the favourable side.

TABLE 1

Table showing number of blocks placed on Base Rates A and A^1

Time in minutes	Base rate	
	A. No. of Blocks Replaced	A^1
End of 1st Min.	8	8
2nd Min.	6	13
3rd Min.		11
4th Min.	7	10
5th Min.	6	8
6th Min	5	6
7th Min.	4	6
8th Min.	6	4
9th Min.	6	8
10th Min.	7	5
Total No. of Blocks	60	79

30% improvement

The Table 2 indicates that the child reached the target behaviour in increasing order in consecutive experimental sessions.

TABLE 2

Showing number of blocks placed in the experimental sessions and point of reinforcement (Parenthesis).

Time in minutes:	Experimental sessions				
	1	2	3	4	5
End of 1st Min.	(9)	7	7	(10)	(10)
„ 2nd Min,	6	(8)	7	6	(12)
„ 3rd Min.	6	(12)	(10)	(9)	(10)
„ 4th Min.	6	(9)	7	(13)	4
„ 5th Min.	6	(8)	4	(8)	(11)
„ 6th Min.	(10)	(11)	(8)	(11)	(10)
„ 7th Min.	7	(9)	7	(8)	(8)
„ 8th Min.	(9)	(10)	3	7	(14)
„ 9th Min.	(9)	5	(11)	(10)	(10)
„ 10th Min.	(11)	7	(10)	7	5
Total No. of Blocks:	79	86	74	89	94
No. of times being reinforced:	5	7	4	7	8
Improvement:	30%	42%	23%	48.3%	58%

The procedure indicated that the fixed ratio procedure is suitable for improving such a performance. In the last experimental session, the number of times reinforcement got by the child is 8 and the blocks placed are 94 which is a 58 per cent improvement when compared to the base rate situation. Considerable improvement was present during experimental session although in Base Rate A,[1] condition there has been a fall in the score, not very much, and it is 30 per cent indicating stabilization probably. Behavioural aspects reveal that by doing the task, his postural aspect also improved.

Conclusions

This study indicates that possibly operant procedure improves dexterity in athetoid cerebral cases with retardation.

Recommendations

1. Length of study needs to be extended.
2. Large number and different aspects of retardates need to be taken for studies.
3. Other areas of motor functions need to be included in the study.

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