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Using Aberrant Behaviors as reinforcers for children with autism

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Background

Finding reinforcers for children with autism can be difficult as they are often not interested in toys or social reinforcers, and food can be problematic because of difficulties in administration and satiation.

Aberrant behaviors as stereotypy (Lovaas, Koegel, Simmons and Long 1972) are a highly preferred activity and might therefore be used as a reinforcer (Premack 1959). First studies showed initial support (Hung 1978, Sugai and White 1986, Wolery, Kirk and Gast 1985) and no negative side effects such as an increase of stereotypical behavior. (Wolery 1985)
Many children with autism spectrum disorder also exhibit delayed echolalia (Lovaas, Varni, Koegel, Lorsch, 1977, Prizant and Rydell, 1984) and perseverative behavior (Epstein, Taumban, Lovaas, 1985; Lovaas, Newsom, Hickman, 1987) that may possess reinforcing functions.

This study that consists of 3 experiments evaluates the efficacy of using aberrant behavior (stereotypy, delayed echolalia, perseverate behavior) as reinforcers and also considers possible negative side effects as the increase of aberrant behavior in detail.

Experiment 1 compares the use of stereotypy with the use of food/edibles and conditions of varied consequences (food or stereotypy) (as Egel 1981 suggested that using more than one reinforcer in a varied format might raise their effectiveness).

Experiment 2 compares the use of delayed echolalia with the use of food/edibles and conditions of varied consequences (food or delayed echolalia).

Experiment 3 compares the use of perseverate behavior with the use of food/edibles and conditions of varied consequences (food or persevereate behavior.)

General Background

Subjects

Participants were diagnosed as autistic, attended biweekly therapy session at an after school behavior modification program for a least six months and were described as unmotivated to learn (and engaging in aberrant behavior).



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Setting and Tasks

The room had several toys and educational stimuli and could be seen by observers through a one-way mirror. Every child got three tasks that were from their curriculum and that they haven't had mastered for several months.

Design

The effectiveness of the reinforcers (food, aberrant behavior, varied consequences) was assessed in a multi-element design. Every experimental condition was presented at the most three times one after another.

General Procedure

Baseline

The selected tasks were presented in a typical 15 min work session. Baseline was collected over a 6 – to 8 month period (experiment 1 & 2) and in the weeks before the experiment 3 for 1-2 times per week.

Experimental conditions

Every child had two 15 min experimental sessions per week (2-5 days apart). The experimenter sat opposite the child and presented tasks when he got eye contact and the child was sitting attentively. The order of the presentation varied. When a child gave the correct response, the experimenter reinforced with praise AND the chosen consequence. When a child gave the incorrect response or didn't respond within 5 s, he presented a verbal 'No'. A correction trial was presented after two consecutive incorrect trials, these were not included in the data analysis. The experimenter recorded the answer of the child after each task. Beyond that the occurrences of the aberrant behavior was recorded.

Consequence conditions

Direct observations and discussions with parents and therapists revealed child specific aberrant behavior that was chosen as consequence.

Food: The child could choose from preferred food items

Aberrant behavior: The child was allowed (and prompted, if necessary) to engage in aberrant behavior (stereotypy, delayed echolalia, perseverative behavior) for 3-5 seconds after a correct answer.

Varied consequence: Child could choose food or aberrant behavior.

Experimental Observation

After observers training there was an observer behind the one-way mirror who counted the occurrence of the aberrant behavior (besides of the aberrant condition) stereotypy and off-task behaviors with a 10 second partial interval scoring procedure

Post-experimental session observation

The child was observed in a 15 min post-session observation either in another work session with a different therapist or in a free play situation.



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Reliability

Inter-rater reliability was calculated for at least 33 % of baseline and experimental sessions as well as for stereotypy and (off task) behavior.

Experiment 1

Method

Subjects

4 autistic boys between 6 and 9 years (mental age between 2 and 4 years) took part in the experiment. All of them were at least minimal verbal and showed different stereotypy, off-task behavior, tantrums and aggression.

Tasks and Procedure

The children had 3 different tasks to master and received three consequence conditions (food, stereotypy, varied).

Additional analysis

One child was chosen for more detailed analysis. He (and his aggression...) got observed for 30 instead of 15 minutes and his trained mother observed his stereotypy also at home before and during the experiment. Inter-rated reliability was between 92 and 100 %.

Results and Discussion

The most effective reinforcer for all the children was stereotypy. The food consequence was the least successful and was even below the baseline for one child. The varied consequence was also reinforcing for 2 children. When comparing the number of stereotypy, it didn't increase during sessions with stereotypy as a consequence and was less for two children compared to the food conditions. This is also true for the post-session observations where stereotypy increased less for stereotypy consequences than for food.

Additional analysis of one child showed that aggression and off-task behavior increased in post-session observation. This might be the reason as stereotypy decreased aggression in the aberrant behavior condition, increasing task-performance at the same time. The mother's data showed that there were no side effects and that the stereotypy behavior decreased at home.

Experiment 1 showed that stereotypy as a reinforcer was more effective than food and than varied consequences. Furthermore, it didn't show any side effects but might have decreased inappropriate behavior.

Experiment 2

Delayed echolalia seems to have reinforcing qualities (Lovaas et al, 1977; Prizant & Rydell, 1984) and was therefore examined.

Method



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Subjects and Tasks

3 verbal boys between 8 and 10 years participated in this experiment and had to work on three (one boy on two) tasks. Therefore, work session took 10-15 minutes each.

The procedure was the same as of experiment 1, except that the consequence was the encouragement of delayed echolalia instead of stereotypy. Inter-rater-reliability was between 99-100%.

Results and Discussion

Delayed echolalia was the most effective reinforcer for two children. But the varied condition was very similar. One child had slightly better results for varied condition than for delayed echolalia. Food was also slightly effective more effective than baseline for two children and brought worse effects than the baseline for one child.

There was hardly any difference between stereotypy and off-task behavior as well as delayed echolalia in experimental sessions compared to post experimental work sessions. One child had increases in stereotypy and off-task behavior in the free play situation another had increases in delayed echolalia in the free play situation. This might have occurred because of the lack of structure and supervision in free play, as it didn't appear to be a function of a particular experimental condition. Detailed analysis for one child had similar results. There was a decrease in delayed echolalia at home. This is a trend that started before treatment and must be interpreted with caution.

This experiment also showed that delayed echolalia may act as an effective reinforcer.

Experiment 3

The effectiveness of perseveration with specific object as a reinforcer was compared to edibles and stereotypy (instead of varied).

Methode

Subjects

3 autistic boys between 6 and 10 (mental age 3 to 5) took part in the experiment and were allowed to access the perseverated object for 3 to 5 sec upon a correct response, detailed data collection took place from all parents. Inter-rater-reliability was between 93 and 98 %.

Results und Discussion

Perseverate behavior was the most effective reinforcer. For some children, stereotypy was similar effective. Food was close or beneath the baseline. The researched behavior increased in the beginning, but decreased below baseline later on.



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General Discussion

Aberrant behavior could be shown as effective reinforcers for difficult task. Using aberrant behavior as a reinforcer doesn't seem to have negative side effects (see results of them at home and after session)

Stereotypy has some sensory and perceptual properties (rincover and newsom, 1985) that may serve as primary reinforcers as they might stimulate the central nervous system (Lovaas et al 1987) The same might be true for delayed echolalia and perseverate behaivor.

Rincover 1978 and Rincover et al.... 1979 found reinforcing visual, auditory and proprio-receptive sensory consequences that maintain stereotypic behavior in children with autism. When children with autism get older, their low-level stereotypy is replaced by perseveration and echolalic speech (Epstein et al 1985), therefore Lovaas (1987) and Epstein (1985) suggested that the same patterns may result in maintaining the latter behavior (they are repetitive, complex stimuli are produced, and they interfere with appropriate behavior).

Conclusion

The experiment showed that instead of trying to eliminate aberrant behavior, the reinforcing properties of them might be used to result in better learning, and as the experiment showed, there were no negative side effects, the children even accepted the taking away of the object quite easily and were eager to work. This might therefore be a good alternative in behavior change programs.

Limitations of the study are that some children with autism show hardly any stereotypical behavior, or behavior that is very difficult to control by the therapist and that no long-term effects have been observed.

Nevertheless it might be a good method to motivate children in the future.

Please note that every effort has been made to condense and provide a broad overview of this research, however in order not to lose the key information some of the information in this summary has been copied directly form the original article. All credits of the summary whether directly worded or re-worded are solely given to the researchers.

Please contact your ABA/VB consultant before implementing any of the procedures conducted in this paper on your child.

**To read the full study, please download the orginal study from JABA:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1286223/pdf/jaba00088-0025.pdf>**

For the permission to post this study we thank Kathy Hill, Business Manager of JABA

For the summarization and translation great thanks to Caroline Dizioi.