

*ANTECEDENT MANIPULATIONS IN A TANGIBLE
CONDITION: EFFECTS OF STIMULUS
PREFERENCE ON AGGRESSION*

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After a functional analysis indicated that aggression of an 8-year-old boy with autism was maintained by access to preferred items, antecedent manipulations involving the relative preference of restricted and noncontingently available stimuli were conducted. Restricting highly preferred items evoked the highest rates of aggression regardless of the preference level of the noncontingently available alternative items. Restricting less preferred stimuli was associated with moderate rates of aggression even when the alternative items were more preferred.

DESCRIPTORS: aggression, antecedent manipulations, functional analysis, positive reinforcement

An emerging literature indicates that various antecedent events can affect levels of problem behavior during functional analysis and treatment. For example, Smith, Iwata, Goh, and Shore (1995) manipulated several antecedent variables related to escape-maintained self-injury (e.g., rate of demands, task novelty) and demonstrated that these variables functioned as establishing operations (EO). To date, no study has systematically investigated the impact of antecedent variables on functional analysis outcomes for behavior maintained by positive reinforcement. Identifying the specific stimulus parameters that are functionally related to behavior maintained by positive reinforcement may further our understanding of these behavior disorders and facilitate the development of effective treatments based on functional analysis outcomes.

After a functional analysis indicated that access to tangible reinforcement maintained aggression in a boy with autism, levels of aggression were evaluated when materials

high, medium, or low in preference were restricted and were concurrently available with materials of high, medium, or low preference.

METHOD

Participant, Setting, and Response Measurement

Chris, an 8-year-old boy who had been diagnosed with autism, was enrolled in an extended school year summer program to allow his aggression to be assessed. Chris communicated using words and phrases and functioned in the moderate range of mental retardation. Aggression, recorded as a frequency and expressed as number of responses per minute, consisted of hitting, kicking, slapping, biting, pinching, and head butting. Engagement with restricted and noncontingently available alternative stimuli, defined as holding or moving an object with his hands, was scored using 10-s partial-interval recording and was expressed as percentage of intervals. The assessment was conducted in an unused classroom at a public elementary school. A second observer coded 30% of the

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sessions. Mean exact agreement for aggression was 85% (range, 80% to 97%).

Functional Analysis

The functional analysis was similar to that described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994); however, a tangible condition was conducted instead of an alone condition. Materials used in the functional analysis were selected based on the teacher's report of Chris' preferred and non-preferred items. In the tangible condition, a highly preferred book was presented prior to the session. After a minute of engagement, the experimenter told Chris, "It's time to put the book away. You can play with these animals instead." The experimenter removed the book and offered low-preference items (stuffed animals) as alternatives. The alternative items were available to Chris for the entire session. Each instance of aggression resulted in 30-s access to the book. Alternative items were available to approximate the conditions in the classroom, in which Chris had immediate access to a variety of toys and objects. Five 10-min sessions were conducted in each condition, alternated in a multielement design.

Stimulus Preference Assessment

Following the functional analysis, a stimulus preference assessment was conducted with nine classroom items identified by the teacher as items with which Chris engaged frequently (books), occasionally (spinning objects), or never (stuffed animals). In a 10-min free-access situation in which all items were available, Chris interacted only with the books. In a second (5-min) free-access situation in which the books were removed, Chris interacted only with spinning objects. Chris never engaged with stuffed animals in either situation, although stuffed animals were never assessed alone. Next, a 10-trial forced-choice assessment was conducted. Based on these results, items were catego-

rized into three groups: a high-preference group (HPG; three books), a middle-preference group (MPG; three spinning objects), and a low-preference group (LPG; three stuffed animals).

Antecedent Analysis

Four antecedent manipulation phases were conducted. With the exception of Phase 4, three different 5-min conditions were presented three times each (nine total sessions per phase) in a multielement design. In each condition, an item from one group was restricted while items from one of the three groups were noncontingently available as described above. Phase 1 consisted of restricting items from the HPG and offering items from the HPG, MPG, and LPG as alternatives. Phase 2 consisted of restricting items from the MPG and offering items from the HPG, MPG, and LPG. Phase 3 restricted items from the LPG and offered items from the HPG, MPG, and LPG. Phase 4 was identical to Phase 1 and was conducted to determine if Chris had learned to respond with minimal aggression to obtain restricted items. All possible pairings of restricted and alternative items from each of the three preference groups (i.e., H-H, H-M, H-L, M-H, M-M, M-L, L-H, L-M, L-L) were presented at least five times each during each phase.

RESULTS AND DISCUSSION

During the functional analysis (Figure 1), rates of aggression were highest in the tangible condition, indicating that his behavior was maintained by positive (tangible) reinforcement. During the antecedent analysis, higher rates of aggression occurred when items from the HPG were restricted (Phases 1 and 4) than when less preferred items were restricted (Phases 2 and 3), regardless of alternative-item preference. A substantial amount of aggression occurred even when

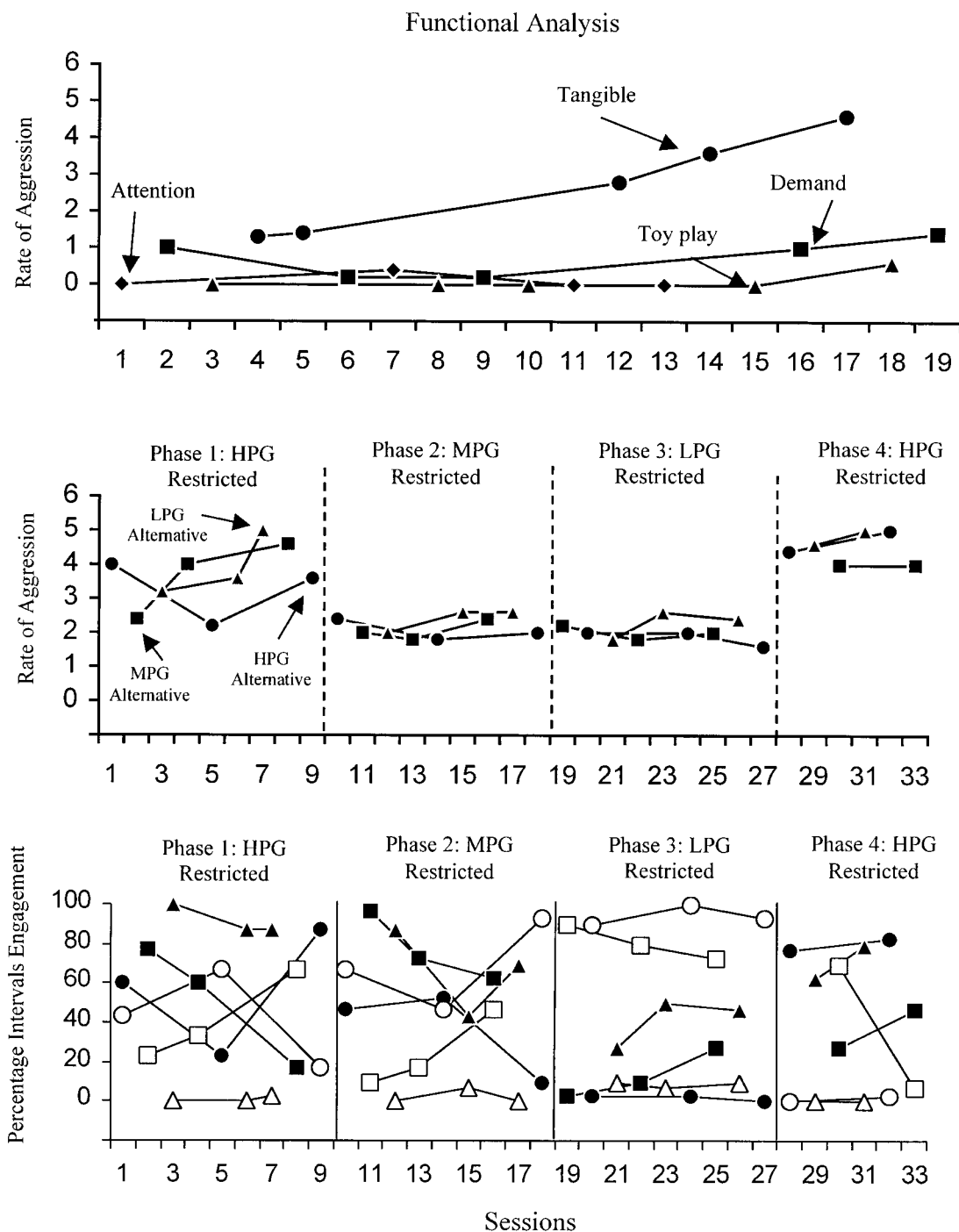


Figure 1. Functional analysis results (top panel), rate of aggression during the antecedent analysis (middle panel), and percentage of intervals of engagement with restricted and alternative items during the antecedent analysis (bottom panel). In the bottom panel, filled symbols represent engagement with restricted items, and open symbols represent engagement with alternative items. Circles represent sessions that provided alternative items from the HPG, squares represent sessions that provided alternative items from the MPG, and triangles represent sessions that provided alternative items from the LPG.

items from the LPG were restricted and items from the HPG were available as alternatives. In fact, items were restricted an average of 10 times per session in each condition, indicating that Chris simply exhibited more aggression per trial when highly preferred items were restricted. Further, time spent engaged with the restricted versus alternative items (bottom panel) was not strongly correlated with levels of aggression.

Presumably, restricting an HPG item and offering an LPG item should have led to more aggression than restricting an HPG item and providing an HPG item. In the absence of the antecedent analysis, an intervention involving the presentation of alternative high-preference items might have been suggested based on teacher reports (that aggression followed restriction of highly preferred books) and functional analysis results (e.g., Fischer, Iwata, & Mazaleski, 1997).

Several explanations for the results are plausible. First, the increase in aggression when HPG items were removed (i.e., rates that exceeded the reinforcement requirement), and the aggression that occurred when items from the LPG and MPG were restricted, could have been evoked by the removal of reinforcement (e.g., Azrin,

Hutchinson, & Hake, 1966). Alternatively, Chris may have exhibited aggression to obtain LPG items because the items functioned as reinforcers even though they were relatively less preferred. Finally, restricting an item per se could have functioned as an EO, temporarily altering the reinforcing value of the removed stimulus or the alternative stimulus. Further research is needed to delineate these processes and to evaluate other antecedents for positively reinforced behavior.

REFERENCES

- Azrin, N. H., Hutchinson, R. R., & Hake, D. F. (1966). Extinction-induced aggression. *Journal of the Experimental Analysis of Behavior*, *9*, 191–204.
- Fischer, S. M., Iwata, B. A., & Mazaleski, J. L. (1997). Noncontingent delivery of arbitrary reinforcers as treatment for self-injurious behavior. *Journal of Applied Behavior Analysis*, *30*, 239–249.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, *27*, 197–209. (Reprinted from *Analysis and Intervention in Developmental Disabilities*, *2*, 3–20, 1982)
- Smith, R. G., Iwata, B. A., Goh, H., & Shore, B. A. (1995). Analysis of establishing operations for self-injury maintained by escape. *Journal of Applied Behavior Analysis*, *28*, 515–535.

Received August 21, 2000

Final acceptance February 28, 2001

Action Editor, Dorothea C. Lerman