FUNCTIONAL ANALYSIS OF STEREOTYPICAL EAR COVERING IN A CHILD WITH AUTISM

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We studied stereotypical ear covering in a child with autism. Results of a descriptive analysis were inconclusive but revealed a correlation between ear covering and another child’s screaming. An analogue functional analysis showed that ear covering was emitted only when the screaming was present.

DESCRIPTORS: stereotypy, descriptive analysis, analogue functional analysis, autism

Some instances of problem behavior have been linked to idiosyncratic environmental relations (e.g., Carr, Yarbrough, & Langdon, 1997; Van Camp et al., 2000). Such cases require a comprehensive functional assessment that often includes interviews, descriptive analyses, and experimental analyses. Although self-injury and aggression have been shown to be a function of idiosyncratic events, research is only beginning to emerge on the possible social and nonsocial reinforcers maintaining stereotypy (e.g., Kennedy, Meyer, Knowles, & Shukla, 2000). In this paper, we present an analysis of stereotypical ear covering that was reported by the child’s teachers to serve no identifiable function. The purpose of the study was to identify social or nonsocial stimuli that maintained ear covering.

METHOD

Jeb was a 5-year-old boy who had been diagnosed with autism and who was not taking psychotropic medication. He used facial expressions and gestures to communicate, had typical motor skills, and was estimated to have adaptive behavior in the 24-month age range. Jeb attended a special education classroom for children with autism and was referred by his teachers, who reported that he frequently engaged in stereotypical ear covering (placing one or two hands over his ears). Jeb’s teachers stated that they could not identify potential reasons for the behavior and that he engaged in ear covering throughout the day.

Descriptive analysis. Forty-three 30-min observations were conducted across 4 days (four observations for each time of day). Observers used a 30-s partial-interval paper-and-pencil system to record the occurrence of ear covering, the events present when it occurred (i.e., play, snack or lunch, instruction, transition, or screaming), and any changes in adult behavior that occurred immediately after the behavior. These included initiate interaction (a person starting an interaction with Jeb), terminate interaction (a person stopping an interaction with Jeb), or no change in interaction (no alteration in the status of social interaction). A second observer independently recorded data during 33% of observations. Interobserver agreement, which averaged 97% across all events.
Descriptive Analysis

Figure 1. The top left panel shows the temporal pattern of ear covering during the descriptive analysis. The top right panel shows the presence of antecedents and consequences when ear covering occurred during the descriptive analysis. The bottom panel shows levels of ear covering across conditions during the analogue functional analysis.

(range, 88% to 100%) was determined by dividing occurrence agreements by occurrence agreements plus disagreements.

Audiological exam. Following the descriptive analysis, an audiological exam was conducted at the Wilkerson Center at Vanderbilt University to assess Jeb’s sensitivity to certain stimuli. The exam assessed whether Jeb would cover his ears when stimuli were presented under controlled conditions. No unusual threshold sensitivity to auditory stimuli presented at 60 dB was identified, but frequent ear covering occurred in the presence of 1-kHz to 15-kHz auditory stim-
Stereotyped behavior was observed at or above 80 dB (Anne Marie Tharpe, personal communication, July 10, 2000).

**Analogue functional analysis.** An analogue functional analysis of ear covering was conducted in an empty classroom using methods described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) and Kennedy et al. (2000). The conditions, which lasted 5 min and were spaced 5 min apart, included alone, attention, control, and demand (see Kennedy et al.). Each condition was presented once per day. In addition, another student’s screaming (which occurred frequently during the descriptive analysis) was audiotaped. The noise was digitized via computer and found to have a peak decibel level in the 1-kHz to 5-kHz range (Jon Tapp, personal communication, December 10, 2000). The audio recording (80 dB) was continually presented 1 m from the participant on the basis of findings from the descriptive analysis and audiological exam. During sessions when the noise was presented, if Jeb covered his ears, the noise was turned off for 15 s. During the attention-plus-noise and demand-plus-noise conditions, ear covering produced either attention or escape from demands and 15 s of noise termination. All conditions were videotaped for subsequent scoring using 15-s partial-interval recording. A second observer independently recorded ear covering during 27% of observations, and the mean occurrence agreement was 93% (range, 85% to 100%).

**RESULTS AND DISCUSSION**

Figure 1 shows that ear covering occurred at similar levels throughout the school day (greater than 60% of intervals). The top right panel shows the proportion of intervals in which specific antecedent and consequent events were present when ear covering occurred. No antecedent or social consequence was consistently associated with ear covering except the presence of the classmate’s scream. These data suggested that social reinforcement contingencies were not relevant to ear covering and that the behavior may have been associated with loud noises. The audiological exam replicated the correlation between the presence of noise and ear covering observed in the classroom and identified the stimulus parameters under which this correlation was likely to occur.

Ear covering occurred most often when noise (i.e., screaming) was added to the alone, attention, or demand conditions of the analogue functional analysis (Figure 1). These data indicate that ear covering was not sensitive to social reinforcement because the availability of social consequences in the noise condition did not elevate levels of the behavior above those recorded in the alone-plus-noise condition.

These findings suggest that ear covering was maintained by negative sensory reinforcement (noise attenuation) and illustrate the importance of linking descriptive and analogue functional analyses when idiosyncratic events are implicated in behavioral maintenance. Whether a similar relation between ear covering and noise occurs for other children with autism awaits further investigation. However, the current data set implicates a previously unidentified source of reinforcement as one possible cause of stereotypical behavior.

**REFERENCES**


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