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ASSESSMENT AND TREATMENT OF EXCESSIVE STRAIGHTENING AND DESTRUCTIVE BEHAVIOR IN AN ADOLESCENT DIAGNOSED WITH AUTISM

DAVID E. KUHN

KENNEDY KRIEGER INSTITUTE AND
JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

AND

SAMANTHA L. HARDESTY AND NICOLE M. SWEENEY

KENNEDY KRIEGER INSTITUTE

Repetitive behaviors such as excessive straightening are commonly observed among individuals with autism. Attempts to prevent these behaviors may increase the likelihood of other problem behaviors. The present study was designed to assess and treat the excessive straightening and associated destructive behaviors of a 16-year-old boy who had been diagnosed with autism and moderate mental retardation. Following a series of functional analyses, an intervention that incorporated functional communication, extinction of destructive behavior, and blocking of repetitive straightening was demonstrated to be effective in reducing straightening and destructive behavior.

DESCRIPTORS: autism, functional communication, precurrent behavior, straightening

The presence of restricted, repetitive, and stereotyped patterns of behavior that may be manifested as nonfunctional routines or rituals (American Psychiatric Association, 2000) is a defining behavioral characteristic for individuals diagnosed with autism and related pervasive developmental disorders. The routines and rituals may include behaviors such as repetitive cleaning, straightening, or organizing items (Klinger & Dawson, 1996). These behaviors may monopolize a large portion of a person's day, disrupting his or her day-to-day functioning. Excessive straightening or routines may also interfere with the behavior and activities of others. For instance, a child may attempt to straighten (or restore) the furniture of his classroom each time he enters the room. Some of these behaviors are not problematic due to their topography alone, but become problematic when they occur under specific stimulus conditions. For instance with an individual who repetitively throws away materials, picking up trash on the floor at home may be acceptable (and even appreciated), but picking up trash in a public restroom would be unhygienic.

Response blocking (i.e., physically or mechanically disrupting the response prior to its completion) is one procedure that has been demonstrated to be effective in reducing ritualistic behavior (Foa, Steketee, Grayson, Turner, & Latimer, 1984). Unfortunately, several studies have shown that response blocking alone may occasion other problematic behaviors from individuals with developmental disabilities (Hagopian & Adelinis, 2001; Hagopian, Bruzek, Bowman, & Jennett, 2007; Murphy, Macdonald, Hall, & Oliver, 2000). For example, Murphy et al. found that aggression increased substantially when the therapist blocked the participant from engaging in rituals (flushing papers, collecting and hiding

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Address correspondence to David E. Kuhn, Westchester Institute for Human Development, 305 Cedarwood Hall, Valhalla, New York 10595 (e-mail: dkuhn@wihd.org).

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household items). It is possible that problem behavior in this case may function to terminate blocking and gain (or regain) access to repetitive behaviors (i.e., a response–response relation; Fisher, Adelinis, Thompson, Worsdell, & Zarcone, 1998; Hagopian et al., 2007). One intervention that has proven to be effective when this response–response relation exists is functional communication training (FCT; Fisher et al.). Fisher et al. used FCT in combination with response blocking to suppress repetitive or ritualistic behaviors in contexts in which it was inappropriate and to provide individuals with an appropriate means to display the repetitive or ritualistic behaviors at more appropriate times.

The purpose of the current study was to extend previous research on the functional analysis and treatment of problem behaviors that exist within a response–response relation. Specifically, the function of destructive behavior in relation to the inappropriate and excessive straightening behaviors of an adolescent with autism was identified via a series of functional analyses and was treated using differential reinforcement and response prevention.

METHOD

Participant and Setting

Eric was a 16-year-old boy who had been admitted to an inpatient facility for the assessment and treatment of severe aggression and destructive behavior. In addition, he was reported to engage in frequent and persistent straightening behaviors at home and school. His caregivers reported that in the course of straightening, he had thrown away important documents (e.g., insurance forms and bills) and electronic equipment (e.g., iPod, cell phone). He had previously been diagnosed with autistic disorder, moderate mental retardation, and disruptive behavior disorder, not otherwise specified. He communicated using vocal speech.

Data Collection and Interobserver Agreement

Data were collected on Eric's targeted destructive behaviors, including disruptions (i.e., breaking, ripping, or tearing objects; throwing objects; banging on walls or objects; and swiping objects off surfaces), physical aggression (i.e., hitting, kicking, punching, and hair pulling), and verbal aggression (i.e., threatening statements, name calling, and swearing). Data also were collected on Eric's straightening behavior, characterized by placing trash or nontrash items into a trash can. Real-time data were collected by trained observers using laptop computers and, when possible, through a one-way mirror. A second observer independently collected data during a mean of 50% of sessions. Each session was divided into 10-s intervals. Interobserver agreement was calculated by dividing each session into 10-s intervals, dividing the smaller number of responses in each interval by the larger number, calculating a mean for all intervals, and converting the result to a percentage. Mean interobserver agreement was 98% (range, 89% to 100%) for destructive and straightening behaviors.

Functional Analysis

An initial functional analysis was conducted as described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) to determine the environmental variables that maintained destructive behavior. Five conditions (toy play, social attention, tangible, demand, and ignore) were evaluated in a multielement design. Ten-minute sessions were conducted in a padded therapy room. Only materials relevant to the stimulus condition were present in the therapy room. For example, during the demand condition a desk, two chairs, and academic and vocational demand materials (e.g., notebook, pencil, etc.) were present.

Blocking Analysis

Next, a blocking analysis was conducted to determine if a functional relation existed between

destructive behavior and access to straightening behavior, as suggested by descriptive data (i.e., antecedent–behavior–consequence data) collected by caregivers and staff. These data suggested that Eric was likely to engage in destructive behavior when he was interrupted from engaging in straightening behaviors. Two conditions (noncontingent access to straightening and contingent access to straightening) were compared in an ABAB design, in which A was the noncontingent access condition and B was the contingent access condition. All sessions were 10 min in duration and were conducted in a patient bedroom. The environment was baited with specific materials with which Eric could interact. That is, a total of 10 objects, categorized as either trash (five) or nontrash (five), were placed throughout the bedroom (e.g., empty soda can [trash], crumbled paper towels [trash], floppy disk [nontrash], utensils [nontrash]). In addition, Eric had access to moderately preferred toys (identified in a preference assessment; Fisher et al., 1992), although at no point did he attempt to discard any of these preferred leisure items. The therapist attempted to block all straightening behavior while saying, ''You can't throw that away right now,'' but allowed Eric to discard one item following each instance of problem behavior during the contingent access condition; no other attention was provided. A therapist was present but did not interact with Eric during the noncontingent access condition; straightening and problem behaviors did not produce any social consequences.

FCT Evaluation

Based on the results of the blocking analysis, therapists taught Eric to use the phrase, ''Is this trash?'' to determine whether subsequent attempts to engage in straightening behavior would be permitted or blocked. The effectiveness of functional communication (FC) with extinction was evaluated across a series of reversals. Session durations were initially 10 min long, but were terminated following 30 s without straightening or FC beginning with Session 8. The termination criteria were changed because after placing all of the items in the trash can, Eric picked up the trash can and attempted to leave the room. Attempts to block him from exiting the room occasioned problem behavior.

Baseline sessions were identical to those of the contingent access to straightening condition from the blocking analysis. FC with extinction sessions were similar, except that if Eric asked, ''Is this trash?'' and the therapist responded, ''yes,'' he was permitted to discard that item in the trash can. If the therapist responded, ''no,'' or Eric failed to communicate, the therapist blocked subsequent attempts to discard the item. Initially, five items were categorized as trash and five as nontrash. The therapist responded ''yes'' if the item was previously categorized as trash and ''no'' if it was not trash. The occurrence of destructive behavior did not produce access to the straightening behavior (i.e., extinction). After demonstrating a functional relation between Eric's destructive behavior and contingent access to straightening in a reversal design, the number of items that he was permitted to discard (i.e., trash) was decreased systematically, while the items themselves were kept constant. For example, when the ratio of trash to nontrash items was changed from 5:5 to 4:6, one of the items previously identified as trash was recharacterized as nontrash, and therefore Eric was not permitted to discard it. The purpose of this manipulation was twofold. First, this arranged a situation in which something previously considered trash was no longer labeled trash. For example, at home some papers found on a counter may be considered trash (e.g., junk mail) and other papers may be important documents (e.g., bills). Second, this decreased the number of opportunities that Eric had to throw materials away. This was intended to develop tolerance to times when his requests to discard items were denied.

RESULTS AND DISCUSSION

Low and undifferentiated rates of destructive behavior were observed in all conditions of the initial functional analysis, thus failing to reveal a clear behavioral function (Figure 1, top). Near-zero rates of destructive behavior were observed during the noncontingent access condition of the blocking analysis (second panel), but rates increased to high levels ($M = 1.48$ responses per minute) during the contingent access conditions, suggesting that Eric's destructive behaviors were maintained by contingent access to straightening behaviors.

The results of Eric's FC treatment evaluation are depicted in the third (rates of communicative and destructive behavior) and fourth (straightening of trash and nontrash items) panels of Figure 1. Rates of destructive behavior were elevated during baseline sessions and decreased to near-zero levels when FC and blocking were implemented. Throughout this analysis, Eric periodically identified items in the environment (e.g., balled-up tissues) that were not baited (i.e., the 10 objects purposefully placed in the room) by the experimenters and either placed them in the trash or communicated to determine whether or not they were trash. All nonbaited items found by Eric were coded as trash, which accounted for sessions associated with more than 100% of items straightened. The ratio of trash to nontrash items was adjusted systematically during the last phase of the analysis, giving Eric fewer opportunities to dispose of trash. On several occasions after the number of trash items was decreased to four (i.e., Sessions 46, 47, 48, and 50), Eric managed to throw one nontrash item (per session) in the trash can. Each time, that item was removed from the trash, and the environment was restored. Eric did not attempt to replace that same item in the trash once it was removed.

These results demonstrated that Eric effectively communicated to determine whether or not an item was trash prior to engaging in his straightening behavior, and overall he responded in accordance with the therapist's response (i.e., "yes, it is trash" or "no, it is not trash"). These data are consistent with previous research showing that individuals with autism may engage in straightening behaviors (Klinger & Dawson, 1996), and that attempts to prevent these behaviors may increase rates of other problem behaviors (Hagopian et al., 2007; Murphy et al., 2000). Further, these data provide additional support that functional communication and response prevention can effectively decrease problem behaviors occasioned by the interruption of high-probability ongoing activities (Fisher et al., 1998).

This relation between problem behavior and straightening may be viewed as a precurrent contingency in which problem behavior (precurrent response) increases the likelihood of obtaining reinforcement through straightening behavior (current response) (Fisher, DeLeon, & Kuhn, 2000). Other potential relations also may explain the patterns of straightening and destructive behavior observed in the blocking analysis, including response competition or a response-class hierarchy. These alternative relations do not appear to be present in these data. Eric did not engage in problem behavior during the initial functional analysis when the opportunity to engage in straightening behaviors was not present (i.e., during the ignore sessions, when there were no extraneous materials in the therapy room), making it unlikely that the reinforcement associated with straightening behaviors competed with reinforcers available for problem behavior. Also, no differential social consequences were provided for straightening (in the noncontingent access condition) or following problem behavior (in the contingent access condition) during the blocking analysis, making it unlikely that both responses formed an operant class maintained by a common social consequence. The reinforcer for straightening appeared to be nonsocial (automatic) in the form of a clean environment.

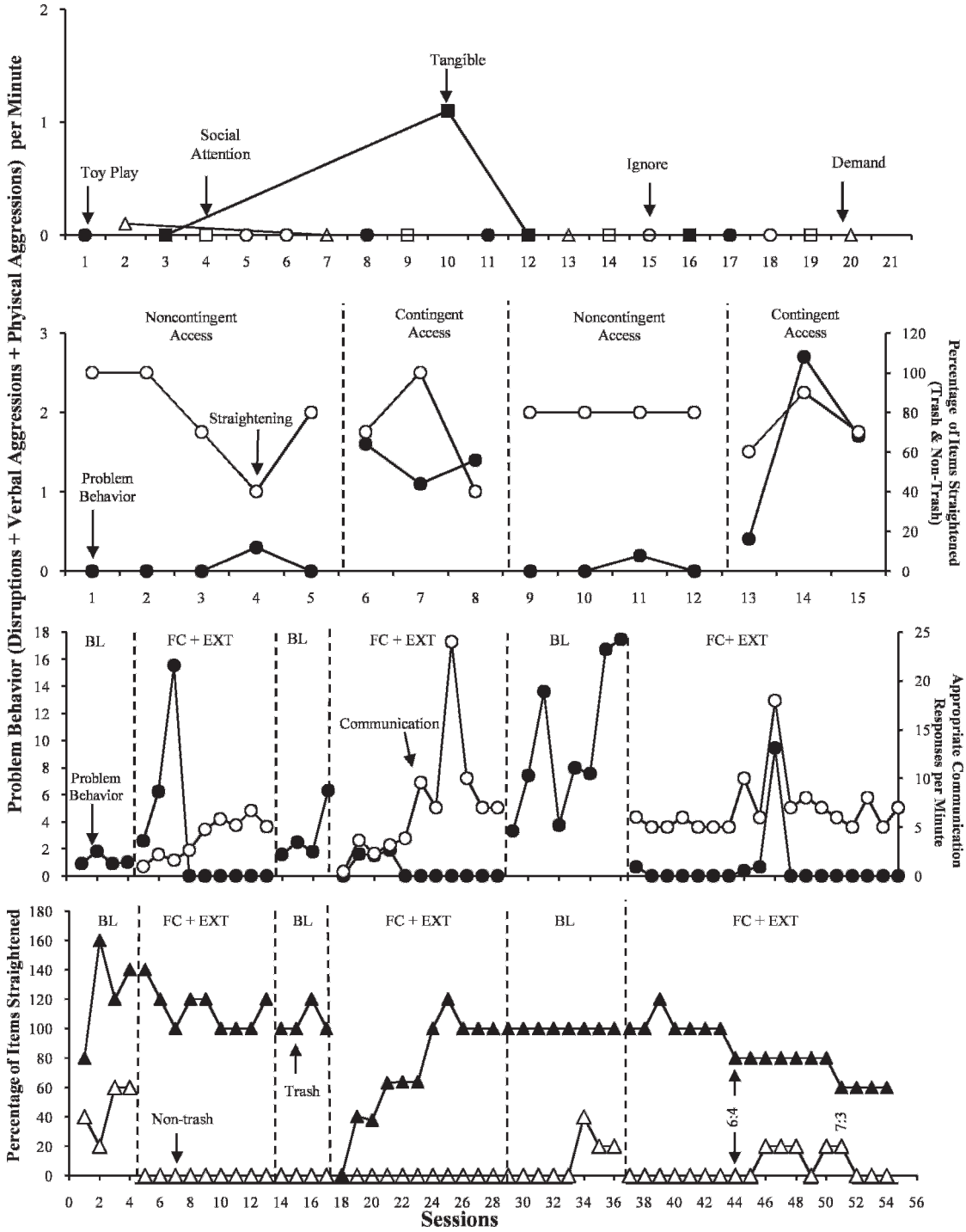

Figure 1. The initial functional analysis (top), showing destructive behaviors per minute across conditions. The blocking analysis (second panel), showing destructive responses per minute across contingent access to straightening and noncontingent access to straightening conditions. The evaluation of functional communication with extinction (third panel), showing rates of destructive and communicative behavior across baseline and treatment conditions, and the percentage of total baited items (trash and nontrash) placed in the trash can (fourth panel).

Destructive behavior alone did not produce this clean environment, but rather produced access to the opportunity to engage in straightening.

This study is limited in that there was only 1 participant for whom these effects were demonstrated. In addition, an analysis of the specific variables that maintain straightening behaviors themselves (e.g., decreasing autonomic arousal) was not conducted, but could prove to be useful in the identification of additional treatment components. This treatment addressed only straightening behaviors that occurred in the presence of staff and caregivers. Behaviors maintained by automatic reinforcement, such as straightening, are likely to occur both in the presence and absence of others; however, this study did not address the latter condition. Future research could examine the effects of other differential reinforcement procedures to reduce covert behaviors.

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