

DECREASING PROBLEM BEHAVIOR ASSOCIATED WITH A WALKING PROGRAM FOR AN INDIVIDUAL WITH DEVELOPMENTAL AND PHYSICAL DISABILITIES

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In the current investigation, a functional analysis suggested that positive reinforcement in the form of physical contact maintained the self-injurious behavior of a girl with developmental and physical disabilities. We used the information obtained from the functional analysis to develop a treatment for noncompliance with walking in which a therapist removed physical interaction following inappropriate behavior during walks.

DESCRIPTORS: ambulation, partial-weight support, physical attention, self-injurious behavior

Walking is a milestone of typical child development, and usually occurs around the age of 12 months. Children with developmental and physical disabilities show impairments in the acquisition of typical developmental milestones such as walking, which may negatively affect other areas of their development (e.g., self-sufficiency; Winter & Kiely, 2006). Behavioral treatments, such as differential reinforcement, have been used to promote walking for individuals with developmental and physical disabilities (e.g., Horton & Taylor, 1989; Lancioni et al., 2004, 2005). Lalli, Mauk, Goh, and Merlino (1994) reported that physical prompting was successful for increasing compliance with instructions to walk for 2 individuals with developmental disabilities. However,

the exact behavioral mechanism for the resulting change in behavior is unknown, because Lalli et al. did not conduct a formal evaluation of the variables that maintained refusal of walking.

Individuals with developmental disabilities may have difficulties with walking, and they may exhibit destructive behavior (e.g., self-injurious behavior [SIB], flopping, other refusal behavior) when they are required to walk from one location to another. For example, McCord, Thomson, and Iwata (2001) hypothesized that terminating an activity, initiating a new activity, or movement itself may have maintained the SIB that occurred for 2 individuals during transitions between activities. Treatments based on the outcomes of functional analyses that assessed these variables were successful in reducing SIB associated with transitions. However, the behavior-analytic literature suggests that identifying the exact operant mechanism for problem behavior is not always necessary for effective treatment. That is, contingent access to arbitrary reinforcers (i.e., those that do not maintain problem behavior but are nevertheless reinforcers for some other behavior) may

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effectively reduce problem behavior in some cases. For example, Fischer, Iwata, and Mazaleski (1997) provided noncontingent access to arbitrary reinforcers (i.e., preferred items) to reduce attention-maintained problem behavior exhibited by 2 individuals. In the current investigation, physical attention was identified as a reinforcer for 1 individual's SIB. This reinforcer was then applied to decrease problem behavior during walking.

METHOD

Participant and setting

Gail was a 16-year-old girl who had been diagnosed with moderate mental retardation, generalized anxiety disorder, and cerebral degenerative chorea; she was enrolled in a day program for the treatment of SIB and for the development of academic and vocational programs. She communicated through brief (e.g., one- to two-word) vocalizations and exhibited limited self-help skills, although she was able to complete some vocational tasks (e.g., preparing foods) with minimal physical guidance. Due to her physical disabilities, she required assistance from several individuals when completing complex tasks (e.g., toileting, walking). However, she often became noncompliant during such tasks (e.g., lifting her feet off the ground during transitions), such that she required complete physical guidance to complete the task. Consequently, she was confined to a wheelchair for the majority of her day, even though she possessed sufficient musculature to support herself during standing and walking. Based on her physical disabilities and her noncompliance with physical tasks, one of her educational goals was the development of a daily walking routine.

Sessions for the SIB analysis were conducted in a fully padded room (3 m by 3 m) equipped with a one-way observation window. The walking analysis was conducted in empty hallways approximately 10 m in length, and each session consisted of walking from one hall

to the next. SIB analysis sessions lasted 10 min, and walking sessions lasted 5 min. One to four sessions were conducted daily.

Response Measurement and Interobserver Agreement

During the SIB analysis, data were collected on self-hitting (defined as open or closed contact of the hand to the head or body) and head banging (defined as forceful contact between Gail's head and a surface). During the walking analysis, the primary dependent measure was foot withdrawals, which were defined as Gail lifting the bases of both feet off of the ground and not supporting her own weight for a period of at least 3 s. Data also were collected on correct steps, which were defined as lifting one foot off of the ground for less than 3 s and subsequently placing her foot in front of her body such that the base of her foot made complete contact with the floor.

Frequency data were used to record SIB and correct steps and were converted to responses per minute by dividing the observed frequency of these responses by the length of the observation period (5 or 10 min). Duration data were collected on foot withdrawals by recording the number of seconds that Gail's feet were lifted off of the ground. These data were converted to a percentage-of-session measure for the purpose of data analysis by dividing the total length of the response by the duration of the observation (300 s or 600 s) and converting this ratio to a percentage.

During all sessions, an observer collected data on a laptop computer while following Gail on the walk. A second observer collected data during 71% of all SIB analysis sessions and 42% of all walking sessions. Interobserver agreement coefficients were calculated by partitioning each session into 10-s intervals and dividing the number of 10-s intervals with exact agreement (i.e., both observers recording the same duration or frequency of occurrences within a given interval) by the number of 10-s intervals with agreements plus those with

disagreements and converting this ratio to a percentage. Mean interobserver agreement was 98% for SIB, 99% for foot withdrawals, and 98% for correct steps.

Procedure

SIB analysis. Prior to the walking analyses, the function of Gail's SIB had been assessed on several occasions and had suggested that physical attention (i.e., holding on to a therapist) was one variable suspected to maintain SIB. Thus, a multielement comparison of continuous and contingent physical attention was conducted. In the continuous contact condition, a therapist sat next to Gail on the floor such that Gail was able to wrap her arms around the therapist, or the therapist held hands with Gail throughout the session. No other form of attention was provided. The contingent physical attention condition was identical to the continuous attention condition, except that the therapist moved close to Gail such that she could wrap her arms around the therapist or hold hands with the therapist for 20 s contingent on SIB. The results of the SIB analysis suggested that physical attention functioned as a positive reinforcement for SIB. This information was used to develop a treatment for walking.

Walking analysis. During the initial walking analysis, two conditions were compared in a reversal (ABAB) design. Both conditions consisted of a modified partial-weight support program (e.g., Hesse, 2001) in which two therapists walked along either side of Gail to provide assistance and stability while also supporting her weight by holding her at the wrists, under her armpits, and across her chest if she withdrew her feet. If she did not withdraw her feet, the therapist held her under her armpits and held her wrists. During baseline, she was prompted every 30 s to take a step or to continue walking, and she received brief praise (e.g., "good job walking Gail, keep going") if she was walking appropriately. If she withdrew her feet at any time, the therapists continued to

support her full weight, issued prompts every 30 s, and continued along the route but did not deliver praise.

Access to physical attention was manipulated during the treatment analysis for walking. Specifically, during the treatment condition for the walking analysis, physical attention was removed contingent on the occurrence of a foot withdrawal by the therapists crouching down and moving approximately 1 m away from Gail for a period of 10 s, such that Gail could sit on her knees on the floor but could not physically interact with the therapists. Thus, the therapists no longer supported Gail's weight if she withdrew her feet, and she was either allowed to sit on the ground or stand unassisted. At the end of the 10-s interval, the therapists either picked Gail up or reimplemented the support procedure (if she was standing on her own). With the exception of the brief praise, there were no differential consequences in place for correct steps. The length of the treatment sessions was corrected for the amount of time that the therapists were not supporting Gail, such that all baseline and treatment observations consisted of 5 min of therapist support.

RESULTS AND DISCUSSION

Figure 1 (top) shows the results of the SIB analysis. Higher rates of SIB were observed in the contingent contact condition ($M = 28.4$ responses per minute) than in the continuous contact condition ($M = 9.5$), suggesting that access to physical attention functioned as a positive reinforcer for SIB.

Figure 1 (middle) shows the occurrence of foot withdrawal. In baseline, relatively high levels of foot withdrawals were observed ($M = 66\%$ of the session). When physical attention was removed contingent on foot withdrawal, a decrease in that behavior was observed ($M = 7\%$ of the session). Foot withdrawals reemerged during the reversal to baseline ($M = 88\%$ of the session) and decreased again when the treatment was reintroduced ($M = 15\%$ of the session).

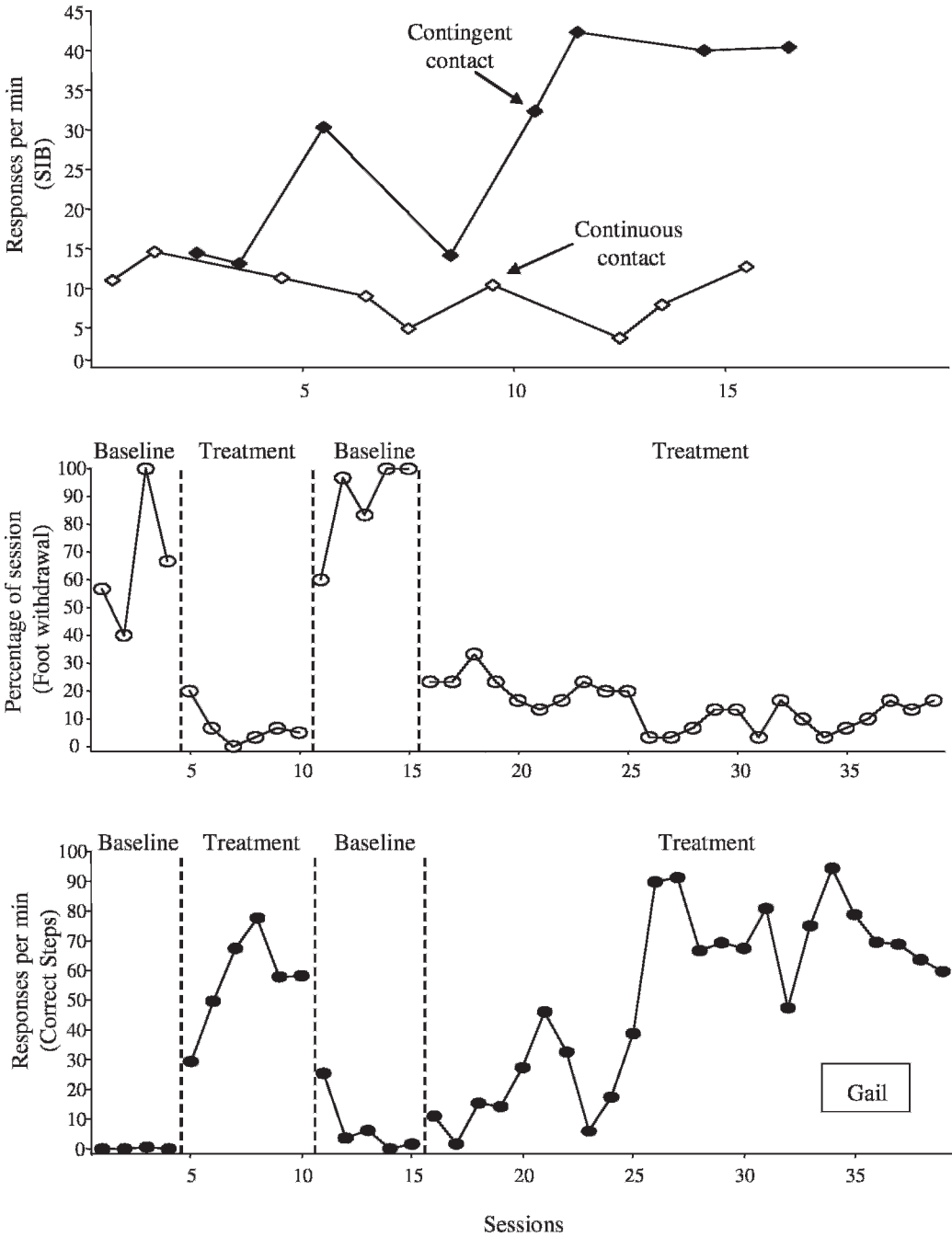


Figure 1. Responses per minute of SIB (top) during the SIB analysis, percentage of session with foot withdrawals (middle), and responses per minute of correct steps (bottom) during the walking analysis.

Figure 1 (bottom) shows the occurrence of correct steps. During baseline, near-zero rates were observed ($M = 0.2$ responses per minute). By contrast, when the treatment was introduced for foot withdrawals, a corresponding increase in correct steps was observed ($M = 56.6$). Correct steps decreased during the reversal to baseline ($M = 7.4$) and gradually increased

during the final phase of treatment ($M = 51.4$). Relatively low rates of SIB ($M = 1.1$) occurred throughout the walking analysis (data not shown).

In the current investigation, contingent removal of physical attention decreased problem behavior (i.e., foot withdrawals) that occurred when walking. Results of the SIB analysis suggested that physical attention (in the form of Gail intertwining her arms with those of the therapists or holding onto the therapists' torsos) functioned as a reinforcer. Although physical attention was not directly evaluated as a reinforcer during the walking analysis, it is possible that the removal of physical attention for 10 s contingent on a foot withdrawal functioned as punishment (i.e., contingent cessation of a preferred activity). Likewise, it is possible that correct steps increased because this response resulted in prolonged access to physical interaction and increased the probability that Gail would contact praise; however, the praise contingency was identical across both conditions. Alternatively, foot withdrawals and correct steps may have been affected by the avoidance of some aversive properties of the treatment procedures. For example, foot withdrawals may have decreased as a function of the discomfort associated with sitting on the floor, or correct steps may have increased due to the avoidance of losing bodily support. It is also possible that the loss of physical support may have affected the potency of praise as a reinforcer for correct steps, which may have increased Gail's motivation to engage in correct steps.

One limitation of the current investigation is that we did not directly evaluate the specific sources of reinforcement that maintained problem behavior during walks (i.e., via a functional analysis). However, the treatment for inappropriate behavior during walks was developed based on the results of the SIB analysis, which suggested that physical attention functioned as a reinforcer. Thus, the current method is similar

to that applied in previous research (e.g., Fischer et al., 1997) in which an arbitrary reinforcer (i.e., one that has not been demonstrated to maintain a specific aberrant response) was applied to the treatment of destructive behavior. A second limitation of the current analyses is that data were not collected on holding onto the therapist during the walking analysis. These data may have further supported the anecdotal observation that Gail engaged in high rates of this response in the walking analysis. Third, it is possible that higher rates of SIB were observed in the contingent contact condition than in the continuous contact condition because the type of physical attention delivered interfered with the occurrence of SIB (i.e., less SIB occurred in the continuous contact condition because Gail's hands were on the therapist). However, SIB did occur in the continuous contact condition, suggesting that SIB was possible during this condition. It should be noted that SIB was treated through additional analyses that were not included in the current investigation.

The current study adds to the literature regarding behavioral approaches to promoting walking in at least two ways. First, it provides an example of a likely reductive procedure (e.g., punishment). Second, it demonstrates the use of alternative assessments prior to treatment development. In the current investigation, the SIB analysis essentially functioned as a reinforcer assessment in which a potent positive reinforcer was identified and subsequently manipulated during treatment. In sum, the current results suggest that reinforcers functionally related to other (i.e., nontarget) responses can be arranged to construct an effective program that promotes appropriate behavior during walking.

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