

PARENTAL USE OF ESCAPE EXTINCTION AND DIFFERENTIAL REINFORCEMENT TO TREAT FOOD SELECTIVITY

CYNTHIA M. ANDERSON AND KIMBERLY McMILLAN

WEST VIRGINIA UNIVERSITY

Escape extinction combined with differential reinforcement for acceptance has been demonstrated to be an effective treatment for food selectivity when implemented by trained professionals in clinic settings. This study evaluated the efficacy of parent-implemented escape extinction in the child's natural environment using video monitoring to train parents and assess intervention efficacy. Parents were able to use intervention to significantly increase bites accepted and decrease problem behavior.

DESCRIPTORS: food selectivity, escape extinction, differential reinforcement

To date, behavioral interventions for food selectivity have been implemented primarily by trained professionals in clinic settings. One intervention reported to be effective in such settings is escape extinction (i.e., nonremoval of the spoon) combined with differential reinforcement of acceptance (DRA; e.g., Ahearn, Kerwin, Eicher, Shantz, & Swearingin, 1996). Although previous studies have shown that parents can be trained to implement escape extinction after intervention gains are obtained by trained therapists (e.g., Ahearn et al.), little research has systematically evaluated parents' ability to serve as initial change agents. The current study evaluated parents' ability to effectively implement escape extinction in their home. We used a video monitoring method to provide feedback to parents during the intervention and assess treatment integrity.

Kimberly McMillan is now with Autism Services in Charlotte, North Carolina.

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Address correspondence to Cynthia Anderson, Department of Psychology, Box 6040, West Virginia University, Morgantown, West Virginia 26506.

METHOD

Participant and Setting

Rick was a 5-year-old boy who had been diagnosed with pervasive developmental disorder and severe mental retardation. His parents videotaped at least one meal each day. Videotapes were scored weekly by trained observers. At the time of the study, Rick's diet consisted primarily of mashed potatoes, yogurt, and applesauce. All sessions were conducted by Rick's parents, who spoon-fed him throughout the study. Prior to initiation of intervention, an interdisciplinary evaluation ruled out physiological or organic causes for Rick's food selectivity. However, it was determined that Rick could not safely consume foods thicker than Stage 3 baby food (soft foods that could be gummed such as spaghetti, cottage cheese, and yogurt).

Procedure, Data Collection, and Interobserver Agreement

Fruits (Stage 3 baby food fruits of varying types) were targeted for intervention per parental request. Meals consisted of fruit and foods reported by parents to be preferred. A food preference assessment was not conducted; however, the differences in acceptance between preferred foods and fruit during baseline suggested that Rick's parents

were able to identify preferred foods accurately.

Frequency data were collected on parent and child behaviors. Parent behaviors included reinforcer delivery and bites offered for preferred food and fruit. Reinforcer delivery was defined as offering Rick a sip of milk within 5 s of acceptance of a bite. Offering a bite of food was defined as holding the spoon within 7.62 cm of Rick's mouth. If the spoon was removed for less than 3 s and then returned to the mouth, a new bite was not scored; however, if the parent removed the bite for 3 s or more (in the absence of acceptance), a new bite was scored when the parent once again brought the spoon to within 7.62 cm of Rick's mouth. Escape was coded if the parent removed the spoon for 3 s or more in the absence of acceptance.

For Rick, frequency data were collected on *acceptance*, defined as allowing a bite of food to be placed in the mouth (regardless of latency); *expulsion*, defined as a bite of food larger than a pea appearing outside of the lips; and *self-injury* (SIB), which included head banging, arm biting, and banging his arm on the table. *Interruptions*, defined as blocking presentation of bites (e.g., head turning, pushing spoon away with hands), were scored as either occurring or not occurring in continuous 3-s intervals. This allowed calculation of the percentage of bites offered that were accepted, expelled, associated with SIB, or interrupted. A second observer independently collected data on 31% of sessions. The exact occurrence agreement coefficient was 86% for reinforcer delivery, 95% for allowing escape, and 93% for bites offered. Agreement coefficients for target child behaviors were 90% for acceptance, 94% for expulsions, and 72% for interruption. The mean agreement score for SIB was 94%.

During baseline, Rick's parents fed him as they normally did; no instructions were given

as to what foods Rick should be offered or how foods should be presented. Because Rick's parents included fruit during only one of the first three meals, they were asked to include fruit at each meal beginning with the fourth baseline meal. During baseline the parent prompted Rick to eat by holding a bite of food in the air close to Rick's mouth. If Rick opened his mouth, he or she placed the bite in his mouth, but if he did not immediately accept the bite or if he cried or turned away, the spoon was typically removed.

In the next phase, Rick's parents were trained to use escape extinction and DRA for presentation of preferred food and fruit. Each meal consisted of the target food—fruit—and at least one preferred food that was fed to Rick during baseline meals (i.e., applesauce, mashed potatoes, or yogurt). Parent training was conducted via verbal and written instruction, modeling, videotape review, and feedback during weekly home visits. Prior to implementing the intervention, Rick's parents reviewed written instructions and discussed them with the authors. Also, they role-played the procedure with one another acting as Rick, and watched a video of the first author implementing the intervention with another child. When the parents began implementing the intervention, feedback was provided throughout the first three meals. After the third meal, feedback was provided during approximately one meal per week. Also, parents reviewed segments of videotaped meals from the previous week with the first or second author and discussed key points (e.g., correct or incorrect implementation of the procedure). Because the parents had difficulty implementing the intervention during the first meal, they were instructed to use escape extinction and DRA with preferred foods only (fruit was not offered) for the next five meals.

Parents were taught to place a bite of food on the spoon and hold it to Rick's lips until

he accepted the bite. They were taught to place the bite in Rick's mouth when he opened his mouth (e.g., to accept the food, to cry, to yawn). When Rick accepted the bite, his parents were instructed to praise him and immediately provide him with a sip of milk (a favorite drink). Parents were instructed to ignore interruptions and to keep the spoon as close to Rick's mouth as possible. Bites were not re-presented upon expulsion (expulsions were not followed with reinforcer delivery; instead, parents offered Rick a bite of preferred food). This procedure was implemented because Rick seldom expelled food and because his parents stated that they were uncomfortable re-presenting bites of fruit following expulsion. The parents rotated between preferred foods and fruit, and the meal continued until Rick had consumed the required portion of fruit. The parents often continued the meal until he had also consumed the portion of preferred food. The parents were instructed to continue all meals until Rick had accepted a bite; that is, meals never ended after an interruption, expulsion, or self-injury.

Rick initially was required to consume one bite of fruit per meal. Criteria for increasing the amount to be consumed by two bites was a 60% reduction in disruption from baseline for two consecutive meals. However, the parents often increased the number of bites required before this criterion was met. Also, at the 18th treatment meal, the parents began to present an entire jar of baby food (approximately 20 to 30 bites) at each meal because they believed he was doing so well.

During the reversal to baseline, meals consisted of fruit and preferred foods, but the parents once again used the procedure they had used prior to training: One parent held a spoonful of food about 15.24 cm from Rick's mouth and placed the bite in his mouth if he opened it. The parent typically removed the spoon if he did not immedi-

ately accept the bite or if he turned away or exhibited other problematic behavior. Thus, consequences for refusal or problem behavior were identical to consequences delivered during the initial baseline condition.

RESULTS AND DISCUSSION

Figure 1 shows the percentage of bites accepted, the percentage of bites interrupted, the percentage of bites expelled, and the percentage of bites presented during which self-injury occurred. In baseline, Rick rarely consumed bites of fruit, and interrupted an average of 55% of bites of fruit presented. His parents allowed Rick to escape an average of 83% of bites of fruit offered. During the first meal of DRA plus extinction, Rick exhibited interruptions during 77% of bites of fruit and 60% of bites of preferred food. Self-injury occurred during approximately half of the bites of both preferred food and fruit presented. The parents had some difficulty implementing the procedure correctly. Although they followed acceptance of fruit with a reinforcer on 100% of bites, they did not always reinforce acceptance of preferred foods (69% of bites accepted were followed by a reinforcer) and they failed to implement escape extinction on 60% of the bites of fruit and 22% of bites of preferred food offered. When only preferred foods were presented (Meals 8 through 12), the parents reinforced 100% of acceptances and removed the spoon prior to acceptance on only 5% of bites offered.

After the fifth treatment meal, fruits were reintroduced and Rick initially exhibited frequent expulsions, interruptions, and self-injury; however, these decreased as intervention progressed, and expulsions ceased to occur after the sixth meal during which fruit was offered. During this phase, the parents correctly delivered reinforcers following a mean of 93% of bites of preferred food and 87% of bites of fruit. Escape was allowed to

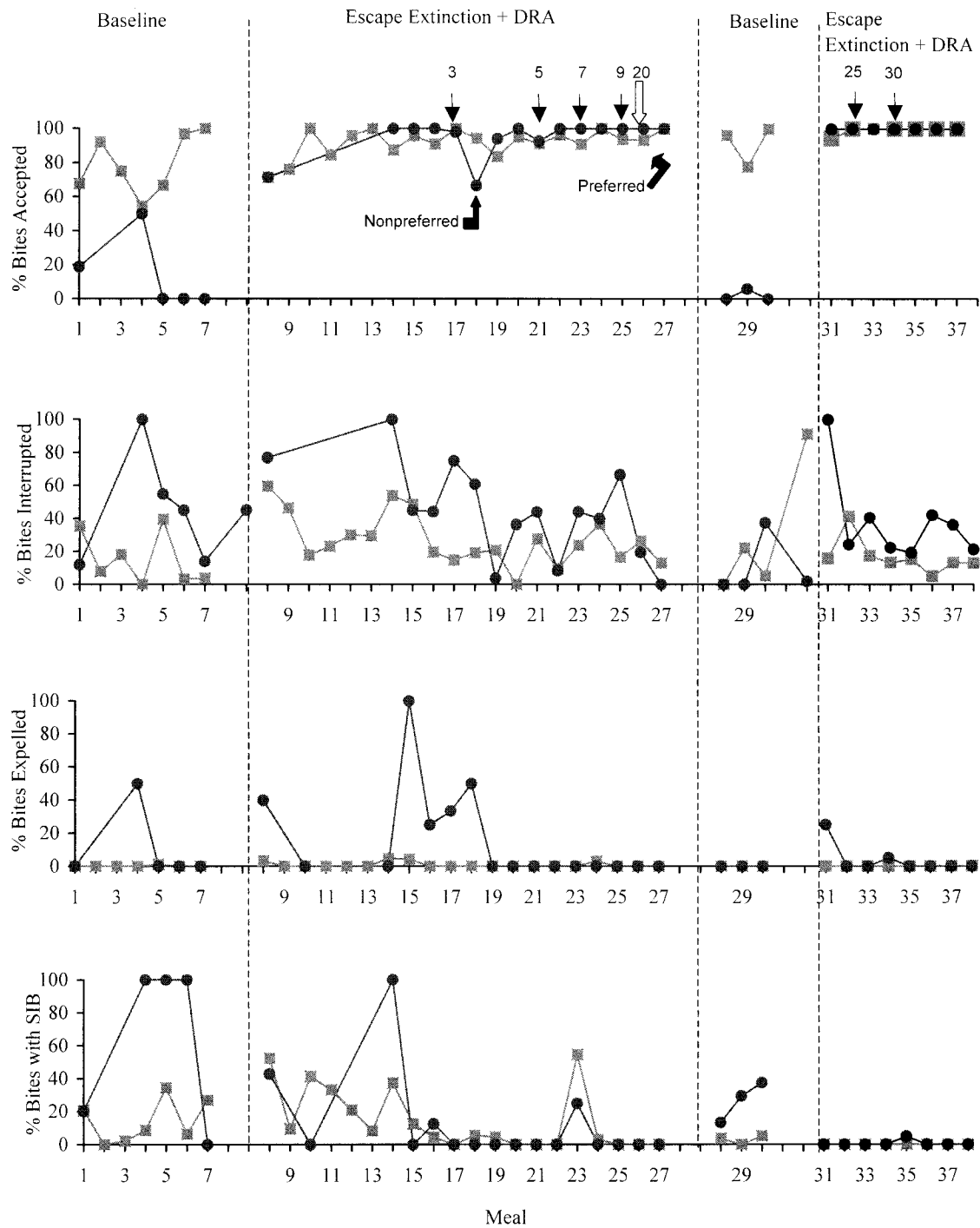


Figure 1. Percentage of bites accepted (first panel), interrupted (second panel), and expelled (third panel); and percentage of bites offered during which self-injury occurred (fourth panel). The closed straight arrows represent meals in which the number of required bites was increased, and the open arrow indicates the point at which Rick's parents began feeding the entire jar of fruit at each meal.

occur following a mean of 7% of bites of preferred food and 9% of bites of fruit.

During the reversal, Rick accepted 97% of bites of preferred food and 2% of bites of fruit. Percentage of bites interrupted, expelled, and associated with SIB remained low; however, interruptions of bites of fruit increased during the last meal. Bites of preferred food and fruit were never followed by reinforcer delivery. Further, escape followed a mean of 7% of bites of preferred food and all bites of fruit.

During the last phase of escape extinction plus DRA, Rick accepted a mean of 99% of bites of preferred food and 100% of bites of fruit. Interruptions occurred during a mean of 17% of bites of preferred food and 38% of bites of fruit. Although interruptions did not markedly decrease relative to baseline, during baseline his parents rarely prompted him to consume fruit, and when they did prompt they typically stopped as soon as Rick protested; thus, he had few opportunities to emit disruptive behavior in baseline. Bites associated with expulsion and SIB remained low during the final phase of treatment. During this phase, the parents implemented the intervention consistently, delivering a reinforcer following a mean of 95% of bites of preferred food and 93% of bites of fruit accepted. Escape was allowed following only 1% of bites of preferred food and 3% of bites of fruit.

Previous research has shown that escape extinction combined with DRA is an effective intervention in in-patient treatment settings. The current study suggests that Rick's parents were able to serve as change agents using escape extinction and DRA in the nat-

ural environment. Also, this study suggests that parents might be able to make clinically significant changes in their child's food consumption; at the end of the study Rick was consuming age-appropriate portions of fruit (approximately 4 oz per meal). This study also highlights the potential use of a video feedback system for (a) providing feedback to parents during intervention, (b) evaluating the effectiveness of the intervention, and (c) monitoring treatment integrity. We were able to use the videotaped data collected by Rick's parents to evaluate intervention efficacy and treatment integrity. Also, during weekly meetings with parents, we viewed portions of the videotaped meals to provide them with specific feedback on their implementation of the intervention. The parents reported that this greatly improved their understanding of the specific behaviors they should and should not emit while feeding Rick. One potential limitation of videotaping that should be evaluated further is that it does not allow immediate feedback. Because we reviewed tapes only once per week, there was the potential for Rick's parents to implement some aspect of the procedure incorrectly for several meals before we were aware of the problem and able to provide feedback.

REFERENCE

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