

*AN ALTERNATING TREATMENTS COMPARISON OF
TWO INTENSIVE INTERVENTIONS FOR FOOD REFUSAL*

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We compared two treatment packages involving negative reinforcement contingencies for 3 children with chronic food refusal. One involved physically guiding the child to accept food contingent on noncompliance, whereas the other involved nonremoval of the spoon until the child accepted the presented food. Subsequent to baseline, an alternating treatments comparison was implemented in a multiple baseline design across subjects. After each child had been exposed to at least nine sessions of each treatment condition and percentage of bites accepted had increased to at least 80%, the child's caregivers selected the preferred treatment package. The results indicated that both treatments were effective in establishing food acceptance. However, physical guidance was associated with fewer corollary behaviors, shorter meal durations, and parental preference.

DESCRIPTORS: alternating treatments comparison, food refusal, corollary behaviors

Although it is likely that there are multiple etiologies of food refusal behavior, escape or avoidance of the feeding situation is often a maintaining variable (O'Brien, Repp, Williams, & Christophersen, 1991; Riordan, Iwata, Finney, Wohl, & Stanley, 1984). For this reason, food refusal can be resistant to positive-reinforcement-based interventions and thus require interventions based on negative reinforcement. Two of these interventions, nonremoval of the spoon (Babbitt et al., 1994; Cooper et al., 1995; Kerwin, Ahearn, Eicher, & Burd, 1995) and physical guidance (Hyman et al., 1987; Ives, Harris, & Wolchik, 1978; Kerwin et al., 1995; Riordan et al., 1984), have been documented to be effective. Both interventions involve preventing escape from the feeding situation until the presented food has been accepted.

In nonremoval of the spoon, the food remains in front of the child until it is accepted. In physical guidance, the mouth is guided open with gentle jaw pressure contingent on refusal to accept food. Independent acceptance of food by the child avoids both nonremoval of the spoon and physical guidance. Therefore, these interventions are treatment packages consisting of both negative reinforcement of food acceptance and escape extinction of food refusal (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994; O'Brien et al., 1991). In addition, these interventions typically provide social interaction, and access to other preferred stimuli contingent on food acceptance. Thus, these packages also include positive reinforcement components.

The selection of an appropriate treatment for a particular class of behavior is dependent not only on the relative effectiveness of the interventions but also on the corollary behaviors encountered with each intervention (Axelrod, Brantner, & Meddock, 1978; Newsom, Favell, & Rincover, 1983). Both

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nonremoval of the spoon and physical guidance have the potential to produce maladaptive behavior corollary to treatment. Thus, a comparison of the corollary behavior produced by each procedure has clinical relevance. The purpose of the present study was to compare the relative effectiveness of nonremoval of the spoon and physical guidance as treatments for food refusal and to assess the occurrence of corollary behaviors produced by each procedure. Also, parental preference of treatment was assessed, given that preference could possibly influence whether caregivers implemented the treatment protocol over the long term.

METHOD

Participants

Three children with a history of food refusal were admitted to an inpatient unit to increase food acceptance. The primary source of nutrition for each child was formula or milk delivered via bottle or cup. All children had documented gastrointestinal problems for which they were receiving appropriate medical management at the time of the study. Therefore, eating was not expected to be associated with discomfort during their inpatient admissions.

Calvin was a 3-year-old boy with a history of respiratory distress and global developmental delay who had had surgery to repair an atrial septal defect at the age of 1 year. Calvin exhibited partial food refusal (he would occasionally accept 40% or more of the food presented to him). He generally refused chopped foods and frequently displayed self-injurious behaviors (head banging and face slapping) both during and between meals. Calvin sporadically accepted pureed foods, and while at home he ate only when sitting on his couch.

Pam was a 3-year 6-month-old girl who had been diagnosed with mild to moderate developmental delay. She had a history of

vomiting following bottle feedings, which persisted despite multiple changes in formula, and she frequently refused the bottle. When spoon feedings were introduced, Pam rarely accepted the spoon but occasionally fed herself small bites of chopped table foods.

Donna was a 2-year 9-month-old girl who had been born prematurely with numerous medical complications, including congestive heart failure. Nasogastric tube feedings had been required from 0 to 3 months and 12 to 21 months of age, and intravenous feedings had been required from 15 to 19 months of age. Donna had a history of emesis associated with oral and supplemental tube feedings, consistent with documentation of gastroesophageal reflux and esophagitis. Donna had been a poor oral feeder from birth, with variable acceptance of bottle feedings during her 1st year. Spoon feedings were introduced at 9 months of age, with frequent emesis and limited acceptance of liquid or solid foods.

Setting and Materials

On admission, each child was evaluated for an appropriate seating device, feeding position, and feeding utensils (spoon and cup) by an occupational therapist. All feeding sessions were conducted in one of two rooms (3.1 m by 3.7 m). Each room was relatively devoid of distractions.

Design

An alternating treatments comparison (Barlow & Hayes, 1979) of the two interventions (nonremoval of the spoon and physical guidance) was implemented in a multiple baseline design across subjects. The alternating treatments comparison began after at least four baseline meals with acceptance below 40%. Three trained feeding therapists were randomly assigned for the implementation of each treatment condition. Each treatment type was randomly se-

lected to be conducted in one of two treatment rooms. Session type was quasi-randomized so that each subject would be exposed to an equal number of sessions of each treatment condition across a 2- to 3-day period. Therapist availability occasionally determined which treatment condition was conducted. After the child had been exposed to each treatment condition for at least nine sessions and the percentage of trials with food acceptance had increased to 80% or greater for at least three consecutive sessions in one condition type, a treatment was selected by the child's caregivers. Then, a three-session withdrawal to baseline contingencies occurred in place of the nonselected treatment, and the other sessions were conducted using the selected treatment.

Response Definitions

The occurrence or nonoccurrence of each target behavior was recorded on a trial-by-trial basis and was reported as the percentage of trials in which the target behavior was observed. Multiple occurrences within a trial were recorded but were not included when calculating percentage occurrence.

Acceptance was defined as the participant independently opening his or her mouth 1.3 cm or wider within 5 s of the spoon presentation and allowing placement of the entire spoon into the mouth. If the child opened his or her mouth and allowed the spoonful of food to be placed inside after 5 s, it was not scored as an acceptance. An *expulsion* consisted of the appearance of food past the outer edge of the lips following an acceptance. Three corollary behaviors were recorded. *Negative vocalizations* were defined as the occurrence of crying, screaming, or whining louder than the child's conversational tone. *Disruptions* consisted of interruption of the spoon presentation by the child (e.g., batting away the spoon). *Self-injurious behavior* was defined as hand-to-head or head-to-surface contact. Negative vocali-

zations, disruptive behavior, and self-injurious behavior were scored independently.

Data Collection and Agreement

Children received two to five meals daily, 7 days a week. The food was weighed before and after meals on a digital scale. Feeding therapists used data sheets to record occurrence and nonoccurrence of each response for each trial. A trial was initiated by the simultaneous presentation of a spoon and a verbal prompt to open ([child's name], open"). Each trial lasted 30 s from spoon presentation to the end of the trial with the following exceptions: (a) during nonremoval of the spoon, if the child did not accept the bite; (b) in nonremoval of the spoon and physical guidance, if expulsion of food occurred as the 30-s trial was ending; or (c) during either treatment, if the child accepted the bite within the last 10 s of the trial. If the child accepted the bite within the last 10 s of the trial, then the trial was extended so that the child was allowed access to preferred stimuli and social interaction for at least 15 s. Expulsions or corollary behaviors were scored at any time within a trial, regardless of its length. An acceptance was scored only if it occurred during the first 5 s of a trial.

Occurrence, nonoccurrence, and total agreement were calculated for each behavior by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Interobserver agreement was calculated for at least 33% (range, 33% to 65%) of the meals conducted for each session type for each child. For acceptances, the mean occurrence agreement coefficients were 95.3% (range, 89% to 100%), 93.8% (range, 86% to 100%), and 94.0% (range, 88% to 100%), and the mean nonoccurrence agreement coefficients were 97.8% (range, 92% to 100%), 94.4% (range, 89% to 100%), and 96.9% (range, 91% to 100%), for Calvin, Pam, and Donna, respectively. For expulsions, the mean

occurrence agreement coefficients were 93.6% (range, 87% to 100%), 94.1% (range, 88% to 100%), and 92.5% (range, 84% to 100%), and the mean nonoccurrence agreement coefficients were 90.1% (range, 85% to 99%), 93.2% (range, 88% to 100%), and 92.1% (range, 88% to 100%), for Calvin, Pam, and Donna, respectively. For corollary behaviors, the mean occurrence agreement coefficients were 95.7% (range, 91% to 100%), 91.9% (range, 88% to 98%), and 93.6% (range, 90% to 100%), and the mean nonoccurrence agreement coefficients were 97.7% (range, 94% to 100%), 92.5% (range, 89% to 100%), and 96.1% (range, 92% to 100%), for Calvin, Pam, and Donna, respectively.

Procedure

Within the first 3 days of admission, a stimulus preference assessment was conducted for each child (Pace, Ivancic, Edwards, Iwata, & Page, 1985). These preferred items and activities were then demonstrated empirically to act as reinforcers for an operant response, such as hand clapping or putting away toys, (Fisher *et al.*, 1994) and were the preferred objects used during the study. Participants had no access to solid food outside of the feeding sessions and no access to liquid food for at least 1 hr before and 1 hr after each feeding session.

Each feeding session consisted of four pureed foods with one food from each major food category (fruit, vegetable, protein, and starch). A bite from each food category was offered, rotating across food groups in a randomized sequence without replacement. Twenty spoon presentations occurred in each meal, although the number of trials was increased for Calvin and Pam during the final phase of the study. Spoon presentations for Donna were increased when a decrease in food expulsion occurred. For all conditions, each trial began with a verbal prompt

("[child's name], open") delivered simultaneously with the presentation of the spoon to the center of the child's lower lip; the spoon remained at the lower lip for 5 s or until the spoon was accepted, whichever came first.

Baseline. Acceptance resulted in social interaction and access to preferred toys or activities for the remainder of the intertrial interval. Refusal resulted in removal of the spoon from the lower lip and no access to preferred stimuli or social interaction for the remainder of the intertrial interval. Disruptive behavior was blocked (but hands were not restrained), expelled food was not replaced, and other maladaptive behavior was ignored.

Nonremoval of the spoon. The protocol and scheduled contingencies for this treatment were identical to those in baseline with the following exceptions. At the beginning of each session, the therapist gave the verbal instruction, "You have to stay in the chair until you take all the bites." Each bite of food was presented as in baseline, but the spoon remained positioned at the lower lip until the child opened his or her mouth and allowed the bite to be placed inside. If a bite of food was expelled, the therapist attempted to catch the food with the spoon and re-present it to the child's lower lip. If the food could not be caught by the therapist, another spoonful of the same food was presented. When the child opened his or her mouth and allowed the bite to be placed inside without an expulsion, social interaction and access to preferred stimuli were presented for the remainder of the intertrial interval or for at least 15 s. If an expulsion occurred during reinforcement, the social interaction and preferred activities were removed and the expelled food was re-presented.

Physical guidance. The protocol and scheduled contingencies for this treatment were identical to baseline with the following exceptions. At the beginning of each session,

the therapist gave the verbal instruction, "If you do not take a bite, I will have to help you." Expelled food was re-presented to the lower lip for 5 s. If the child did not display an acceptance within 5 s of either the initial presentation of a bite or the re-presentation of an expelled bite, the therapist physically guided the mouth open by applying gentle pressure to the mandibular junction of the jaw. The bite of food was then placed into the child's mouth. That is, the child was given the opportunity to accept, and, if acceptance did not occur, the child was guided to accept. These guided acceptances were not scored as acceptances. When the spoon was placed into the mouth, social interaction and access to toys were delivered for the remainder of the intertrial interval or for at least 15 s. If an expulsion occurred during reinforcement, the social interaction and preferred activities were removed and the expelled food was re-presented.

Parent selection of treatment and withdrawal. Prior to enrolling the 3 children in this study, the first author described to caregivers each procedure and the manner in which their child would be exposed to each procedure, and then asked for consent to participate in this investigation. Each procedure was described using a flow diagram showing the consequences provided for feeding behaviors. When the child had been exposed to each treatment for at least nine sessions and acceptance had increased to above 80%, caregivers were shown hand-drawn graphs of in-meal data and videotaped treatment sessions by the child's feeding therapist. The therapists were instructed to describe the session-by-session changes in the child's behavior during the alternating treatments phase and to view the videotaped sessions with the caregivers. For each treatment package, videotapes were shown of the first treatment session of each procedure and one other session in which the child accepted at least 80% of the bites.

After viewing the videotapes, the caregivers met with the first author and presented any questions. Most questions involved the child's behavior in the sessions, and all questions were answered by referring to the session-by-session graphs of the child's behavior. The caregivers then were asked, "Which treatment would you prefer to be trained in to feed your child?" All caregivers chose physical guidance. Then, a three-session withdrawal to baseline contingencies was conducted in place of the nonremoval of the spoon condition, and physical guidance was implemented for all subsequent treatment sessions. Caregiver training was implemented 2 weeks before discharge for all 3 children, and all caregivers successfully implemented the treatment package without a feeding therapist present.

Follow-up. Children were scheduled to attend weekly follow-up sessions with their caregivers for the first month after discharge. Subsequent follow-up sessions were to occur monthly. However, Calvin lived over 500 miles from the facility, and follow-up was scheduled to occur by phone contact and videotaped meal sessions at the same time intervals. Follow-up appointments consisted of the feeding of one meal by the child's caregiver. Data sheets were used by the child's caregiver and the first author to record target behaviors.

RESULTS

During baseline, the level of acceptance (Figure 1) was moderate for Calvin ($M = 22.5\%$ of intervals; range, 0% to 60%) and Pam ($M = 27.3\%$ of intervals; range, 0% to 100%) and low for Donna ($M = 3.8\%$ of intervals; range, 0% to 35%). During the alternating treatments phase, the level of acceptance was equivalent for the two treatments, increasing gradually for Calvin, somewhat more rapidly for Donna, and almost immediately for Pam. The mean level

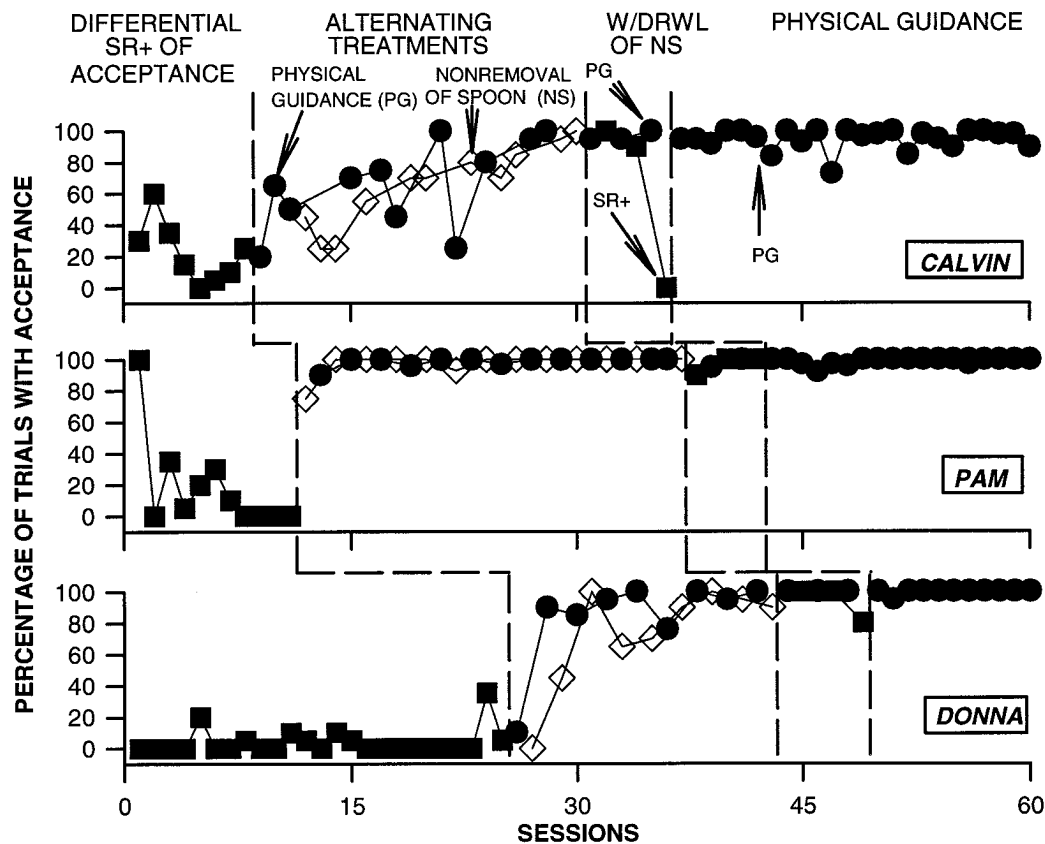


Figure 1. Percentage of trials in which bites were accepted by each child during baseline, physical guidance, and nonremoval of the spoon.

of acceptance associated with each treatment was, for Calvin, M for physical guidance = 66.0% (range, 20% to 100%), M for nonremoval of the spoon = 65.5% (range, 25% to 100%); for Pam, M for physical guidance = 98.7% (range, 90% to 100%), M for nonremoval of the spoon = 96.7% (range, 75% to 100%); and for Donna, M for physical guidance = 83.4% (range, 10% to 100%), M for nonremoval of the spoon = 72.8% (range, 0% to 100%).

The level of expulsion (Figure 2) during baseline was moderate for Calvin (M = 22.4% of intervals; range, 0% to 80%) and high for both Pam (M = 85.8% of intervals; range, 50% to 100%) and Donna (M = 87.5% of intervals; range, 0% to 100%).

During the alternating treatments phase, the level of expulsion was roughly equivalent for the two treatments. The mean level of expulsion associated with each treatment was, for Calvin, M for physical guidance = 11.4% (range, 0% to 35%), M for nonremoval of the spoon = 11.6% (range, 0% to 35%); for Pam, M for physical guidance = 1.1% (range, 0% to 5%), M for nonremoval of the spoon = 2.9% (range, 0% to 30%); and for Donna, M for physical guidance = 88.2% (range, 60% to 100%), M for nonremoval of the spoon = 86.4% (range, 50% to 100%). Expulsion decreased to below 10% for both Calvin and Pam. Donna continued to expel nearly every bite accepted across treatments; however, she did swallow each bite when she stopped expelling. The

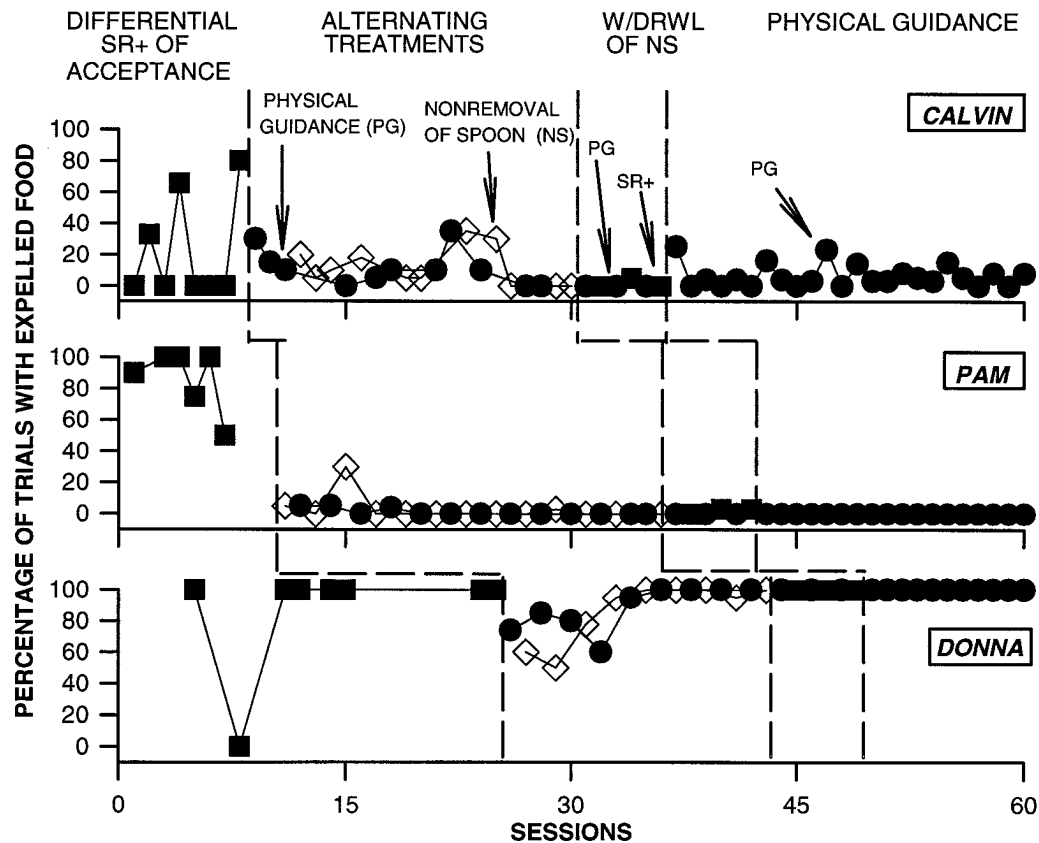


Figure 2. Percentage of trials in which accepted food was expelled during baseline, physical guidance, and nonremoval of the spoon.

mean frequency of expulsions per trial was approximately 2.3 across treatments.

Figure 3 shows the percentage occurrence of the three corollary behaviors: negative vocalizations, disruptions, and self-injurious behavior. During baseline, the level of corollary behavior was high for Calvin ($M = 92.6\%$ of intervals; range, 73% to 100%) and somewhat more moderate for both Pam ($M = 35.3\%$ of intervals; range, 0% to 100%) and Donna ($M = 40.7\%$ of intervals; range, 0% to 100%). The mean level of corollary behavior associated with each treatment was, for Calvin, M for physical guidance = 33.4% (range, 10% to 78%), M for nonremoval of the spoon = 64.8% (range, 15% to 100%); for Pam, M for physical guidance = 12.6% (range, 0% to

80%), M for nonremoval of the spoon = 26.5% (range, 0% to 100%); and for Donna, M for physical guidance = 6.0% (range, 0% to 33%), M for nonremoval of the spoon = 18.3% (range, 0% to 65%). During the alternating treatments phase, the level of corollary behavior was typically higher during the initial sessions. Corollary behaviors were more frequent in the nonremoval of the spoon condition, although this difference was more pronounced for Calvin than for either Pam or Donna. The mean duration of meals associated with each treatment was, for Calvin, M for physical guidance = 20.2 min, M for nonremoval of the spoon = 25.5 min; for Pam, M for physical guidance = 20.4 min, M for nonremoval of the spoon = 23.7 min; and for Donna, M for

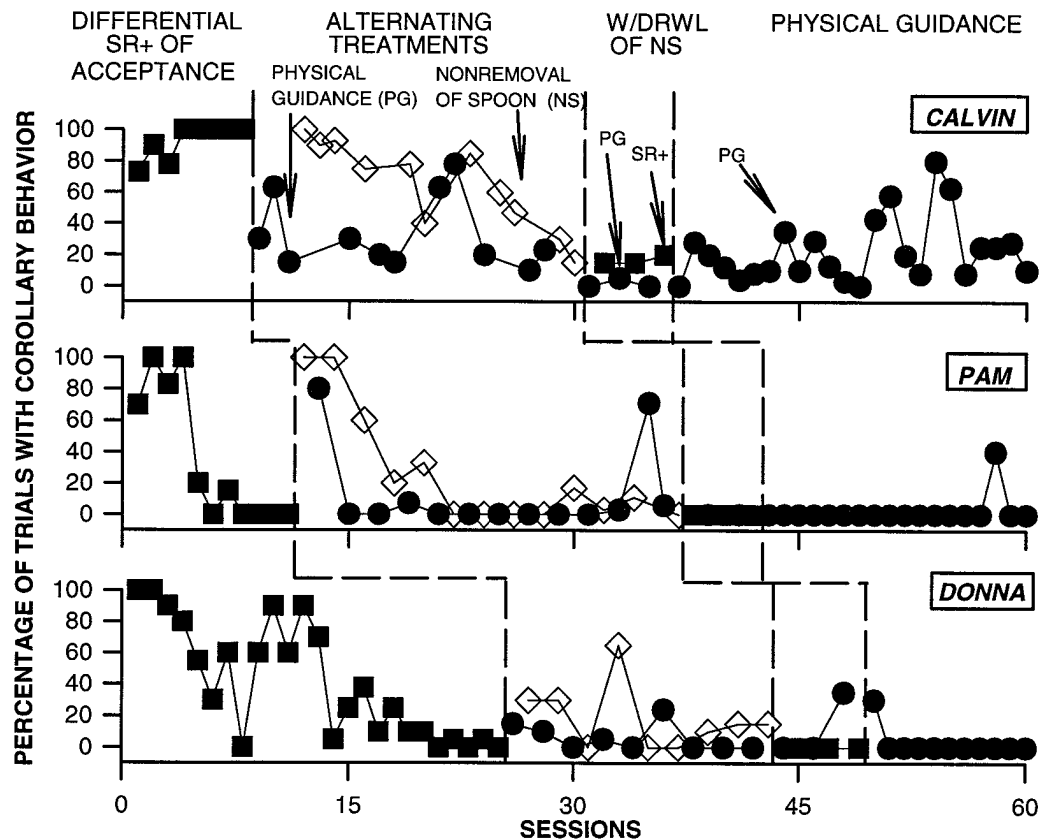


Figure 3. Percentage of trials with the occurrence of maladaptive behavior corollary to treatment during baseline, physical guidance, and nonremoval of the spoon.

physical guidance = 32.1 min, *M* for nonremoval of the spoon = 59.6 min.

Follow-Up

Calvin. After the completion of the study, there was an increase in gagging, emesis, gastroesophageal reflux, and self-injury during and after meals when meal volume exceeded 2.5 to 3 oz per meal. Calvin typically accepted food during the first half of the meal; however, he would gag and vomit or bring food into the back of his throat towards the end of the meal. A gastro-jejunal tube was subsequently inserted to provide additional caloric intake to promote weight gain and growth. After tube placement and a change in feeding position to alleviate intraabdominal pressure, Calvin's gagging, emesis, reflux, and self-injury dropped to near-zero

levels, and he was able to tolerate 3 to 4 oz of pureed food per meal, four meals per day.

After discharge, Calvin advanced to self-feeding chopped food in one or two meals per day and tolerated up to 5 oz per meal. He gained over 9 lb in the 9 months following discharge, although 50% of his caloric intake was by tube. The mean level of acceptance calculated over the last 2 months of follow-up (data collected by his mother) was 97%.

Pam. The amount of food Pam consumed was gradually increased to 7 oz of pureed food for each meal, three meals per day. However, when this meal volume was exceeded, there was an increase in gagging and emesis during meals. Pam also received a snack with chopped table foods that were self-fed. She gained over 9.5 lb in the 10

months after discharge and was consuming 7 oz of pureed food and 2 oz of chopped table food per meal at 6 months after discharge. Pam received the majority of her caloric intake ($>75\%$) from food in meals; she also drank milk from a cup, which accounted for most of the remainder of her caloric intake. During monthly follow-up appointments, Pam's mother continued to use the physical guidance protocol and reported that she used it at home when necessary. The mean percentage of bites accepted during her last four follow-up appointments at 6 months, 8 months, 9 months, and 10 months was 98%. Pam self-fed part of her meals, but her mother continued to present food to her.

Donna. Donna's expulsion of food eventually decreased to below 50% of trials and rarely occurred more than once per trial. Donna was consuming over 3 oz per meal at discharge; however, Donna's parents did not return for outpatient appointments, and no follow-up data were available.

DISCUSSION

Both interventions—physical guidance and nonremoval of the spoon—increased acceptances to above 80% of trials for each child, replicating the results of previous studies (Cooper et al., 1995; Johnson & Babbitt, 1993; Kerwin et al., 1995; Riordan et al., 1984). Although the means of the primary targeted behaviors were fairly comparable across treatments, there is some tentative evidence that physical guidance may have been more effective than nonremoval of the spoon for 2 of the children. Physical guidance produced a slightly steeper curve of acquisition for both Calvin and Donna, indicating that physical guidance may have resulted in more rapid attainment of a criterion of 80% or greater acceptance. However, further study is needed to determine the validity of this finding.

One variable that cannot be ruled out is multiple treatment interference (Campbell & Stanley, 1963; Ullman & Sulzer-Azaroff, 1975). The treatments may have differed in effectiveness if they had been presented in isolation. During multielement implementations of each of these intervention packages in the literature, carryover to untreated conditions has occurred (Kerwin et al., 1995). Also, the failure of acceptance to reverse to baseline levels during the withdrawal phase for Pam (and possibly Donna) may have been caused by carryover effects. For example, it may be that these children refused food due to conditions that were present before but not during their hospital admissions (e.g., a history of discomfort associated with eating food). It is not uncommon for responses on avoidance schedules to persist long after the schedule is terminated. When treatment was initiated, the participants had the opportunity to learn that the conditions that may have produced food refusal were no longer in effect.

Treatment gains established during Calvin's and Pam's admissions were maintained during follow-up, and the amount of solid food consumed by both children increased. However, the increases in food consumption for the 3 children (i.e., 3 to 7 oz) were small relative to amounts eaten by children of comparable ages. Nevertheless, the primary goal for all participants in this study was to increase the acceptance of food, and this goal was clearly met. All children had documented gastrointestinal difficulties that may have contributed to their food refusal. Because each child had a history of vomiting and discomfort while eating due to these difficulties, advancing the volume consumed beyond the point at which significant gagging and emesis occurred was avoided. It then was necessary to make up the caloric need by supplemental feedings (either orally or by tube) with high-calorie liquids, allowing the continuation of meals with infrequent refus-

al and frequent access to positive reinforcement.

Physical guidance seemed to produce less corollary behavior than did nonremoval of the spoon. This difference was consistent across children but was most pronounced for Calvin. However, by the end of the alternating treatments phase, the level of corollary behavior was equivalent across treatments for all children. When the alternating treatments phase was initiated, corollary behavior decreased immediately below baseline for Calvin, with a larger decrease in the physical guidance condition. This may have occurred because these corollary behaviors were subsets of a larger class of refusal behavior for this child. We hypothesized that, when the probability of occurrence of refusal decreased, the likelihood of occurrence of other nontargeted members of this class also decreased.

One potential reason for the differences in corollary behavior is that meals generally were longer during nonremoval of the spoon than during physical guidance for each child. For Donna, the difference was striking, with meals lasting more than 25 min longer, on average, during nonremoval of the spoon. Longer meals may have provided more opportunities for the occurrence of corollary behavior, and this may partially account for the differences in the levels of corollary behavior between the two treatments. However, it seems doubtful that the differences in corollary behavior were solely a function of the differences in meal lengths for the two treatments. Anecdotally, it was noted that most of the corollary behavior emitted by each child occurred at the beginning of the trial.

The potential effects of multiple treatment interference may be less relevant when analyzing the differences observed with corollary behavior. First, the procedural differences between the two packages seem to be quite salient (guidance vs. the child opening

his or her own mouth). Furthermore, if carryover effects occurred during an alternating treatments protocol, it is expected that the carryover would be most prominent during the initiation of the alternating treatments component and would be attenuated over time as discrimination developed. The opposite pattern occurred in this study: The differences in the level of corollary behavior were more apparent when the alternating treatments phase was initiated and diminished by the end of this phase.

A second potential confounding effect is access to preferred events. During the alternating treatments phase, preferred stimuli and social interaction were provided at some point during each trial in both procedures, resulting in more contact with preferred activities than during baseline. The increased density of reinforcement may be one mechanism that was responsible for the improved eating. However, Cooper *et al.* (1995) demonstrated that the most effective component of nonremoval of the spoon was escape extinction.

If one views food refusal as the primary target behavior (rather than food acceptance), then physical guidance might be characterized as a punishment procedure, whereas nonremoval of the spoon would involve escape extinction of food refusal. This might contribute to the notion that physical guidance is a more aversive intervention than nonremoval of the spoon. With nonremoval of the spoon, food refusal no longer results in escape from the aversive stimulus (*i.e.*, escape extinction). In contrast, if physical guidance is presented contingent upon food refusal, and the future probability of this response decreases, then the procedure meets the definition of punishment (Azrin & Holz, 1966). Viewed from this perspective, physical guidance of food acceptance contingent on food refusal is similar to positive practice overcorrection procedures (Azrin & Wesolowski, 1975). However, even

if one views physical guidance as punishment, this procedure was preferred by the participants' caregivers and produced fewer negative corollary behaviors than did non-removal of the spoon. Measurement of factors such as parental preferences and negative corollary behaviors may provide a more empirical method of determining the relative aversiveness of the two interventions.

Perhaps the most interesting finding of this study is that caregivers found physical guidance to be more desirable than nonremoval of the spoon. There is some anecdotal evidence that may help to clarify this issue. Calvin's mother reported that she felt that the physical guidance package "worked better," and Donna's parents stated that they did not want to have a "standoff" during meals. An investigation of the acceptability of these procedures may help to determine why these caregivers selected physical guidance over nonremoval of the spoon (Kazdin, 1980).

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STUDY QUESTIONS

1. The two interventions compared in this study were (a) nonremoval of the spoon and (b) physical guidance following the occurrence of food refusal. What are the basic mechanisms by which both procedures change (decrease and increase) behavior?
2. Briefly describe the two target behaviors and the three corollary behaviors of interest and how they were measured. What was the authors' rationale for collecting data on the corollary behaviors?
3. Describe the general procedures used during feeding sessions throughout the study.
4. What were the main procedural differences between the nonremoval and guidance procedures?
5. Summarize the results obtained with respect to the target and corollary behaviors.
6. What type of experimental design was used to compare the two interventions? Describe one advantage and one limitation of the design, and a feature of the data that may have illustrated this limitation.
7. When parents were asked to select the intervention they preferred, which one was chosen? Aside from the verbal reports provided, what objective features of the data may have accounted for parental preference?
8. In their discussion, the authors mentioned that subjects experienced a higher rate (increased density) of positive reinforcement during treatment, which may have affected the results. To what extent does rate of reinforcement during treatment limit conclusions about the effects of treatment per se or about the relative effects of the two interventions? How might the authors have controlled the rate of reinforcement?

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