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# A multiple-baseline evaluation of the treatment of food phobia in a young boy

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## Abstract

A multiple-baseline design was used to evaluate the effectiveness of a behavioral treatment program using modeling, graduated exposure, and contingency management to treat food phobia in a 4-year-old boy. In addition, a treatment component involving time-out and re-introduction of the initial request to consume the target food was added to reduce vomiting behavior that developed during the course of treatment. The volume and range of foods consumed by the participant increased, and observer-rated anxiety and vomiting decreased over the course of treatment. The results of this controlled evaluation suggest that this treatment program was responsible for the observed changes, which were maintained at 6-month follow-up.

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*Keywords:* Food phobia; Choking phobia; Vomiting; Multiple-baseline design

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## 1. Introduction

Although many specific phobias have been described in the psychopathology and treatment literatures, perhaps none has as serious health implications as the excessive and persistent fear and avoidance of chewing, swallowing, or choking on food or fluids. This phenomenon has been described in the child and medical literatures, where it is typically called “food phobia,” as well as in the adult psychological literature, where it is commonly referred to as “choking phobia” (McNally, 1994) or “food aversion” (DeSilva & Rachman, 1987). It is likely that the term food phobia has been used most often with children because they are often unable to verbalize

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precisely what it is they fear (i.e., choking on food rather than food per se). Indeed, recent reports of both limited literatures suggest that this phenomenon (which I will refer to as “food phobia” in order to remain consistent with the child literature) is characterized by the fear and avoidance of chewing or swallowing food or fluids, which most often occurs directly following a conditioning experience involving choking on food or vomiting (Chatoor, Conley, & Dickson, 1988; McNally, 1994; Singer, Ambuel, Wade, & Jaffe, 1992).

The prevalence and long-term course of food phobia is unknown, as this problem has received little empirical attention. Pediatric feeding disorders in general occur in 25% of all children, and are associated with significant weight loss, medical problems, and the development of behavioral disorders such as bulimia and anorexia nervosa (Manikam & Perman, 2000; Woolston, 1991; Nock, *in press*). Given the negative physical and psychological outcomes associated with pediatric feeding problems in general, and the dearth of research available on food phobia in particular, there is a great need for empirical work focused on this problem.

Most of the literature on food phobia consists of individual case studies, several of which have provided initial support for behavioral treatment approaches (see McNally, 1994 for a review). However, there are several key limitations of this literature. First, the majority of studies have included adult participants. Thus, there is limited information about the efficacy of these approaches with children and adolescents—and a particular lack of information about food phobia in pre-pubertal children (Chorpita, Vitali, & Barlow, 1997; Singer, Ambuel, Wade, & Jaffe, 1992). Second, virtually all of the treatment research on food phobia consists of uncontrolled evaluations, limiting the conclusions that can be drawn about the effectiveness of the treatments employed. A notable exception is a recent study by Chorpita and colleagues (1997) that used a multiple-baseline experimental design to demonstrate the effectiveness of a behavioral treatment program with a 13-year-old girl with food phobia. This study provides an impressive demonstration of the effectiveness of graduated exposure and contingency management in the treatment of food phobia; however, the authors concluded that there is a need to implement and evaluate such treatment strategies with younger children. Given developmental differences in cognitive ability and in typical methods of treatment delivery (e.g., individual treatment versus inclusion of parents in treatment), it is unlikely that the effectiveness of adolescent and adult treatment programs will generalize to young children without major modifications. Indeed, there is a great need to develop and evaluate more developmentally sensitive treatment programs for child behavior problems (Kazdin, 2000; Ollendick & Vasey, 1999).

To address these limitations, the current study evaluated the effectiveness of a behavioral treatment program using therapist and parent modeling, graduated exposure, and contingency management to treat food phobia in a 4-year-old boy. This study employed a multiple-baseline design across different food categories to provide a controlled evaluation of the effectiveness of this treatment program. Moreover, the participant began vomiting immediately after swallowing certain foods, so a treatment component involving time-out from reinforcement and a

re-introduction of the initial request to consume the target food was implemented to address this problem.

## 2. Method

### 2.1. Participant description

The participant was a 4-year-old Latino boy referred for treatment by his parents for refusal to consume virtually all solid foods or fluids. Although the participant did not verbalize a fear of choking, his parents reported that he had not eaten solid foods since choking on partially solid baby food when he was 7-months-old. Since that time, the participant had consumed only soft baby food, oatmeal, water, and protein drinks his parents bought for him to provide adequate nutrition.

The participant was of normal size and weight for his age and a medical examination revealed no physical or medical problems or abnormalities. The participant was not taking any medication at any point during the treatment or follow-up period. Although the participant was not experiencing any medical problems, his food phobia appeared to be contributing to impairments in his family and peer environment. For instance, his parents reported that his fear and avoidance of most foods and fluids led to frequent arguments among family members and was beginning to cause him some distress and difficulties with peers at school. In addition to his fear of food, the participant presented with mild oppositional behavior at home and several sleep-related problems including nightmares, refusal to sleep in his own room, and nocturnal enuresis.

### 2.2. Assessment

#### 2.2.1. Diagnostic assessment

The participant was assessed using the schedule for affective disorders and schizophrenia for school-age children—present and lifetime version (K-SADS-PL, Kaufman et al., 1997). The K-SADS-PL is a clinician administered, semi-structured interview drawing on both child and parent report, which has demonstrated excellent interrater and test–retest reliability and concurrent validity (Kaufman et al., 1997). The full K-SADS-PL was administered at pre-treatment, and the anxiety disorders supplement was re-administered at post-treatment (after the final treatment session) and 6-month follow-up (via telephone interview).

#### 2.2.2. Behavioral avoidance and anxiety

A behavior test was used at pre- and post-treatment to assess the participant's anxiety and avoidance of solid foods. The participant was asked to attempt a number of sequential behaviors that involved approaching and eating three feared foods selected by his parents: rice, beans, and small pieces of chicken (i.e., sit next to the food, hold a spoon, place the spoon in the food, lift the spoon with food on it, touch the food to your lips, put the food in your mouth, chew the food, and swallow

the food). Both of these tests were videotaped and the participant's avoidance (0 = no avoidance/swallowed food, 8 = maximum avoidance/ refused to sit near food) and anxiety (0 = no anxiety, 8 = maximum anxiety) were scored by two independent raters, with excellent interrater reliability ( $r = 0.99$ ).

### 2.2.3. Food consumption and vomiting

The participant's parents kept a daily record of all food and fluids consumed the by participant from the time of the initial evaluation through the completion of treatment. The participant's parents also kept a daily food record for 1 week at 2 and 6 months after the completion of treatment. These daily records were reviewed in treatment sessions each week with the parents and participant to check the accuracy of the record. Although no systematic data on the reliability of these records were collected, regular interviews with the parents and participant suggested that these data represent an accurate record of the participant's ongoing food intake. The food quantities from the food records were converted into "number of servings" by the author using a chart published by the US Department of Agriculture (2000). The daily number of servings were summed for each week, and these weekly totals are reported in the Results section. In addition to keeping a record of food consumption, the participant's parents maintained a record of vomiting incidents that occurred during the course of treatment.

## 2.3. Treatment

Treatment consisted of a behavioral program implemented within the context of a multiple-baseline design to increase the range and volume of food and fluids consumed by the participant. All target food and fluids were classified into four different categories at pre-treatment: (A) fluids (e.g., juice, milk); (B) soft, processed foods (e.g., ice cream, apple sauce); (C) hard, crunchy foods (e.g., cookies, crackers); and (D) tough, chewy foods (e.g., beef, chicken). Food from each of these four categories was gradually introduced to the participant's behavioral program during 21 one-hour sessions (including three in-home) over 27 weeks. The clinician instructed parents in the use of modeling and contingency management techniques, and modeled appropriate use of these techniques in session with the child present. More specifically, the therapist and parents provided positive reinforcement in the form of attention, praise, and material rewards in session and at home for the desired eating behavior, and used planned ignoring for behaviors that interfered with the desired eating behavior. In addition, time-out from reinforcement (i.e., rather than providing positive attention for vomiting) and a re-introduction of the initial request to consume the target food (i.e., rather than providing negative reinforcement via the removal of task demands) were used to decrease the frequency of vomiting that occurred during treatment. Although it was not possible to observe parent adherence to the treatment procedures in all contexts, the parents reported using the treatment techniques during each feeding period and demonstrated proficiency and familiarity with each of these techniques in treatment sessions.

### 3. Results

#### 3.1. Food consumption and vomiting

Data representing the volume (number of servings) and range (four categories) of food consumed by the participant each week over the 27-week treatment period and at 6-month follow-up are presented in Fig. 1. The figure depicts the number of servings of each category of food consumed by the participant during each week of the study. In this design, data were collected and graphed separately for each of the four food categories, and the intervention was applied to the consumption of each of

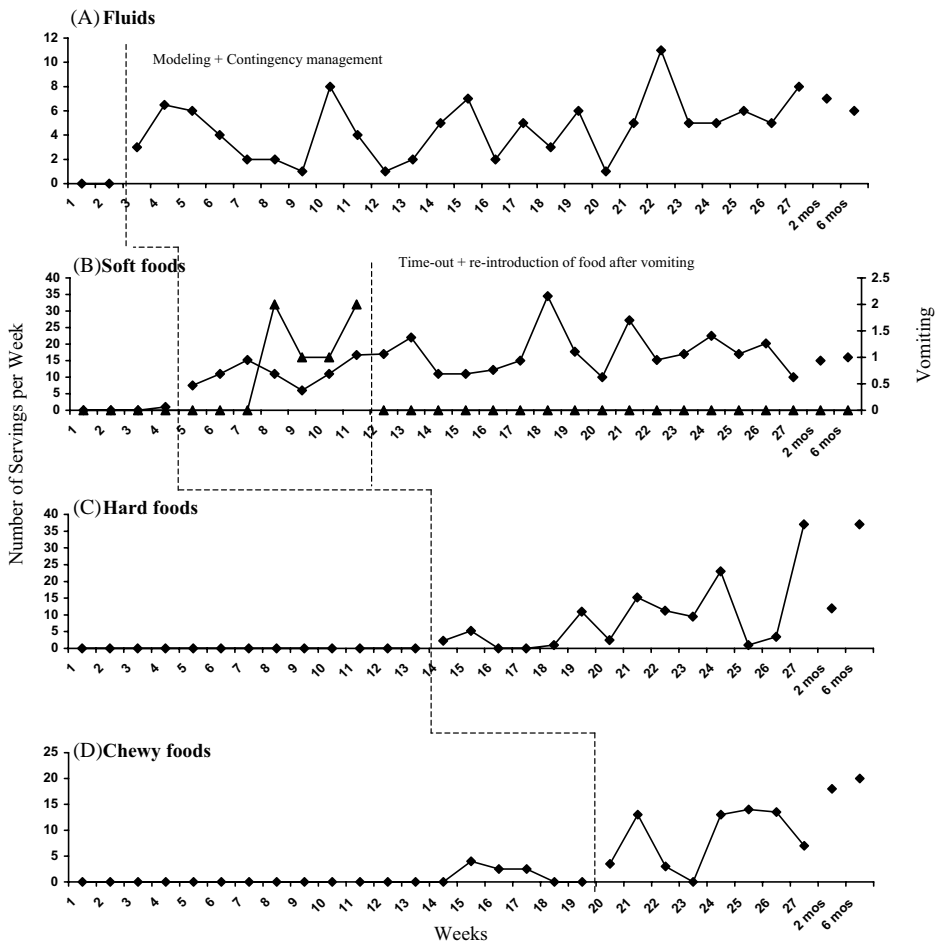


Fig. 1. Multiple-baseline design across four food categories for number of servings per week and vomiting. *Note:* In all four graphs, the lines marked with diamonds represent the number of servings of each food type consumed each week. The line marked with triangles in Graph B represents the number of vomiting episodes each week (indicated on right ordinate).

these four food categories sequentially. Within the context of the multiple-baseline design used in this study, it could be concluded that the treatment program caused an increase in food consumption if the number of servings of food in each category increased when, and only when, the treatment program focused on that food category, thus ruling out the possibility that other factors (e.g., history, maturation, statistical regression, relationship factors) were responsible for any observed changes. In contrast to research employing multiple subjects, in which statistical criteria are used to evaluate whether there is an average treatment effect, single-case experimental designs typically employ criteria that apply to the visual inspection of treatment data to evaluate whether a reliable, consistent treatment effect exists. These criteria have been described in detail elsewhere and include the presence of a change in the magnitude (i.e., mean and level) and rate (i.e., trend and latency) of the target behavior(s) across treatment phases (see Kazdin, 1982, 1984). The satisfaction of the criteria for visual inspection require marked treatment effects that are generally considered more stringent than those for achieving statistical significance (Kazdin, 1982).

Visual inspection of the data suggested that the observed changes were reliable and consistent and were in fact due to the treatment, rather than to other factors. More specifically, as presented in Fig. 1A, there was an immediate change (i.e., no latency period) in the level and trend of fluid consumption when the first phase of the intervention was initiated and there was a clear increase in the mean fluid consumption from the baseline to treatment phase, with no change in the magnitude or rate of the consumption of any other foods during this time. Two weeks later, the second phase began and was accompanied by another immediate change in the level and trend of soft food consumption, which was specific to foods in this category, and again a difference in the mean soft food consumption from baseline to treatment phases is marked and precludes the need for statistical evaluation. A similar pattern was observed for the remaining two food categories. It is notable that the increased rates of food consumption across all food categories occurred in session, at home, and at school, and they were maintained at 6 months follow-up, supporting the generality and stability of the treatment effects.

In addition, as depicted in Fig. 1B, the participant began vomiting during the second treatment phase (soft foods), and this vomiting persisted for 4 weeks. There was an immediate decrease (i.e., no latency period) in the level and trend of vomiting from 1–2 times per week to 0 times per week after the introduction of a treatment component that included time-out from reinforcement and re-introduction of the initial request to consume the target food. The rate of vomiting remained at 0 for the entire treatment and follow-up period, suggesting that this component was effective in treating the participant's vomiting behavior.

### 3.2. Behavioral avoidance and anxiety

At pre-treatment, the participant was able to hold a spoon and insert it into the target food but was unable to raise the spoonful of food (mean avoidance score = 5), in addition, his observer-reported anxiety while performing this task was high (mean

anxiety score = 7). At post-treatment, the participant was able to eat multiple spoonfuls of the target food (mean avoidance score = 0), and had experienced a significant reduction in food-related anxiety (mean anxiety score = 1.5).

### 3.3. *Diagnostic assessment*

At pre-treatment, the participant met K-SADS-PL diagnostic criteria for Specific Phobia. The participant and his parents also reported several symptoms of oppositional defiant disorder, separation anxiety disorder, and enuresis; however, these did not meet diagnostic criteria. At post-treatment, the participant no longer met criteria Specific Phobia or any other DSM diagnosis. He no longer expressed fear or avoidance of a wide range of foods. In addition, the participant no longer experienced impairments in interpersonal functioning at home or at school related to food or eating behavior. These effects were maintained at 6-month follow-up.

## 4. Discussion

The main findings of this study were that a behavioral treatment program using therapist and parent modeling, graduated exposure, and contingency management was effective in systematically increasing the range and volume of foods and fluids consumed, and in decreasing food-related anxiety, in a 4-year-old boy with persistent food phobia. It is notable that these changes occurred across contexts (i.e., therapy sessions, home, and school) and were stable over time (i.e., at 2 and 6 months of follow-up).

This study improves on several limitations of previous studies on the treatment of food phobia, and extends previous research in several ways. First, although most investigations of the treatment of food phobia have been uncontrolled case studies allowing for the possibility that some other factors were responsible for the observed behavior change, the use of a multiple-baseline experimental design in this study demonstrated that the observed changes were due to the intervention, rather than other factors. Second, the results of this experimental analysis support the effectiveness of a behavioral intervention program for the treatment of food phobia in young, pre-pubertal children, a previously neglected group in this literature. Although prior studies of food phobia have demonstrated the effectiveness of graduated exposure and positive reinforcement procedures (e.g., [Chorpita, Vitali, & Barlow, 1997](#); [McNally, 1986](#)), the incorporation of a parent training component and the application of these procedures to a young boy in this controlled experiment represent an important extension of behavioral approaches to the treatment of food phobia. Indeed, the demonstration of the effectiveness of this behavioral treatment program for young children is particularly important given the serious physical and psychological problems associated with feeding problems in young children, as well as the significant differences in treatment approaches for young children.

Another important finding in this study was that time-out from reinforcement and the re-introduction of the initial request to consume the target food were effective in

decreasing the frequency of vomiting behavior. The effectiveness of such procedures in the elimination of vomiting behavior replicates previous research in this area (Alford, Blanchard, & Buckley, 1972; Ingersoll & Curry, 1977), but is novel in its demonstration of the usefulness of such techniques with young children and as an adjunctive component to an existing treatment program.

Although the results of this study are encouraging, there are several notable limitations. First, the treatment program consisted of several components (modeling, positive reinforcement, planned ignoring) and modalities (individual treatment, parent training), thus it is unclear whether all of these aspects of treatment are necessary for change, or whether a more limited treatment would have been equally effective. Second, the primary outcome measure was parent-reported food consumption, and there was no evaluation of the reliability of this method of assessment. However, on balance, the participant's performance in treatment sessions each week, as well as regular individual interviews with the participant and his parents, suggested that the parent's report of food consumption was accurate.

Despite these limitations, these data provide a clear demonstration of the effectiveness of therapist and parent modeling, graduated exposure, and contingency management in the treatment of food phobia, and provide further support for the use of time-out from reinforcement and re-introduction of the initial request for food consumption in the treatment of vomiting behavior that developed during the course of treatment. Parents can be trained to implement these procedures quickly and easily, further supporting the practicality and efficiency of this treatment approach. Future studies should focus on identifying which treatment components are necessary and sufficient for change in this treatment, and on testing the effectiveness of shorter, less intensive version of this treatment. Such approaches will likely improve the effectiveness and efficiency of the treatment of this problem.

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