Running head: FEEDING PROBLEMS IN DEVELOPMENTAL DISABILITIES

Feeding Problems in Individuals with Autism and Developmental Disabilities

Sarah Roth

Barnard College

Abstract

Many children with developmental disabilities exhibit feeding problems, which in turn can lead to malnutrition and respiratory symptoms. The combination of discomfort and pain for the child and difficulty of treatment for the parents and attending professionals validate research on interventions for feeding problems in children with developmental disabilities. Feeding problems range from food selectivity and refusal to rumination and gastroenterological problems that require medical interventions. This paper will review research on feeding problems in children with developmental disabilities and possible causes for these problems, including poor oral-motor coordination, swallowing dysfunction and choking, food selectivity, and aversive feeding behaviors. This paper will further review behavioral treatment strategies for feeding problems, including multicomponent treatments, behavioral momentum procedures, and responses to behavioral cues and stimuli. Differences in diagnoses will be recorded, and factors in effectiveness will be noted.

Feeding Problems in Individuals with Autism and Developmental Disabilities

I. Introduction

Feeding disorders are a major concern for parents of children with autism, since they affect daily living multiple times each day. Parents and professionals try multiple procedures, integrate current research with tried and tested practices, and encourage healthy eating habits in children with developmental disabilities. According to Kodak and Piazza (2008), feeding problems occur in approximately 25% to 35% of neurotypically developing children. In stark contrast, Bruns and Thompson (2011) found that feeding problems occur in 60% to 90% of young children with autism. Feeding disorders include accepting only very specific foods, exhibiting aversions to certain textures, and using the same set of mealtime utensils at every meal (Bruns & Thompson, 2011). Kodak and Piazza (2008) expand this definition to include accepting only specific presentations of foods and refusing types of foods. They also list as consequences of feeding behaviors malnutrition, dehydration, learning and behavior problems, and even death. These consequences are on the severe end of the spectrum, but are nonetheless important motivators for treating feeding disorders. Piazza et al. (2003) defined a feeding disorder as a condition in which a child is incapable or refuses to consume adequate quantities of food or drink to maintain nutritional status, regardless of the cause of the disorder. Through behavioral interventions, children are taught not only to accept and eat certain foods, but also sometimes to feed themselves, granting an important piece of independence.

Keen (2008) drew a connection between feeding difficulties in children with autism with early onset failure-to-thrive. Though feeding problems are relatively common in childhood across both normally developing children and those with some sort of developmental delay, failure to thrive (FTT) occurs in only about 3% of infants. Infants who experience adverse

feeding reactions, including recurrent vomiting, are especially at risk for feeding problems later in development. The basic skills required for feeding include learning to regulate self, suck, swallow and to time beginning and ending of feeding by signals of hunger and fullness compose the first stage of eating behavior. Children who cannot master this stage cannot eat effectively, and exhibit more feeding problems in early childhood. Additionally, psychosocial problems are associated with severe persistent feeding problems. Keen used a case study design to observe seven children with autism who exhibit especially severe feeding problems and who experienced FTT in early infancy, shown by significant weight decrease. Two children presented with gastrointestinal disorders and received a gastronomy for feeding. Three children showed abnormal oral behavior with food, but none had oromotor or other forms of dyspraxia. Cognitive delays in all the children were found only in language function. Inducing hunger did not reduce the selectivity in these children, as had been hypothesized, but rather led to significant weight loss. Keen's study brought the dimension of infant FTT to the body of research around feeding disorders in children with autism.

Schreck, Williams, and Smith (2004) compared eating patterns between children with and without autism. The authors used a standardized questionnaire to compare caregiver reports of the children in the study. The study tested 472 children between the ages of 7 and 9.5 years. Caregiver report of an autism diagnosis and the Gilliam Autism Rating Scale (GARS) were utilized in separating the two groups of children. The Children's Eating Behavior Inventory (CEBI) was distributed to caregivers in order to document the children's eating habits. The questionnaire measures the occurrence of 19 separate eating behaviors and rates them on a 5-point scale. The caregivers were also asked to indicate whether each behavior represents a problem for the family. Additionally, the caregivers completed the Food Preference Inventory, a

listing of foods in the categories of fruits, vegetables, dairy, proteins, and starches. Caregivers evaluated whether or not the child ate an age-appropriate amount of a specific food and whether the food is typically served at family meals. Scores collected included which foods the children ate and which foods the parents ate. Results confirmed that children with autism exhibited significantly more feeding problems than neurotypically developing children. Further analyses were conducted to determine the types of feeding problems exhibited by the children with autism, and Results indicated that children with autism tended to refuse more foods than children in the control groups. Furthermore, children with autism were more likely to require specific utensils, particular food presentations, and foods of low texture than children without autism. Significant differences in the numbers of each type of foods eaten were reported for all of the 5 food groups.

Field, Garland, and Williams (2003) examined specific childhood feeding problems in individuals with and without developmental disabilities who were referred to an interdisciplinary feeding program for the evaluation of feeding problems. The interdisciplinary committee comprised members for Paediatric Gastroenterology, Behavioral Psychology, Nutrition, Occupational Therapy, and Speech Pathology. The researchers reviewed the records of all 349 children, aged between 1 month and 12 years, seen for evaluations over a 30-month period. None of the children were diagnosed with eating disorders. The researchers defined various types of feeding problems seen in the study. Food refusal was defined as the rejection of all or most foods presented to the participant, which led to the child not consuming enough food to meet caloric or nutritional needs. Selectivity by texture was defined as refusal to eat food textures that were appropriate for the child's developmental stage. Selectivity by type was defined as eating only a very narrow range of food that was not nutritionally adequate. Children with selectivity by type

were limited to consuming a few foods and often refused to eat whole food groups. Oral motor delays were defined as issues with chewing, tongue motion, lip closure, or other oral motor areas as determined by speech pathologists or occupational therapists. Dysphagia was defined as problems with swallowing, recorded by a history of aspiration pneumonia or a barium swallow study completed by a speech pathologist. Any child who could not eat specific foods because of a physical disability or inability to consume the foods was excluded from the group. Results indicated that selectivity by type and texture were the most common feeding problems found among children with autism spectrum disorders. Food refusal and dysphagia were also present, but were less prevalent among the children evaluated. The three children with autism who displayed food refusal also presented with gastroesophageal reflux (GOR). Compared with the other children in the study, children with autism displayed a much higher rate of food selectivity by type. More than half of the children with Down syndrome exhibited selectivity by texture. The study did not find any causal relations between preexisting medical and developmental conditions and feeding problems, though children with certain conditions were more often found to have feeding problems. The authors hypothesized that many of the feeding problems were the result of learned aversions, including heartburn or chronic abdominal pain.

Ahearn, Castine, Nault, and Green (2001) performed a systematic study of feeding behavior among children with autism and pervasive developmental disorder-not otherwise specified (PDD-NOS). The 30 children studied in this experiment were students in a private educational and treatment program, and all were diagnosed with autism or PDD-NOS. Participants' feeding behaviors were assessed in six sessions using a self-feeding format in which the food was placed on a spoon on a plate and the child fed himself or herself. Foods were selected from four general categories: fruit, vegetable, starch, and protein. Three items from each

category were chosen to be served through the school cafeteria throughout the course of the assessment. In each session, one item was presented in a pureed form in order to compare food selectivity across textures. In order to clarify the experimental procedures, the authors defined certain responses. Acceptance was defined as taking the food with or without using a spoon, opening the mouth, and inserting the food into the mouth within 5 seconds of the verbal instruction, "Take a bite." An expulsion was defined as the appearance of food outside of the mouth after food had been accepted at some point during the assessment. Expulsion included such behaviors as spitting food out of the mouth, pulling food out of the mouth, or tipping the head to let food fall out of the mouth. Disruption was defined as any reaction that interrupted the presentation of food on the plate. The experimenters conducted assessment sessions before the child consumed lunch and within 15 minutes of the child's normally scheduled lunchtime in order to ensure that the child would be hungry. In each assessment, 120 bites of food were presented, 30 of which were presented in pureed form. Of the 30 children in the study, 17 participants exhibited low overall food acceptance, and 9 participants exhibited a moderate level of acceptance. Additionally, 17 participants demonstrated selectivity for food type or texture. This occurrence was statistically significantly different from the frequency that would be expected to occur by chance. No participants exhibited selective acceptance of vegetables, 3 participants selectively accepted protein, 11 participants selectively accepted starch, and 2 participants selectively accepted fruit. Four participants refused to eat any of the food presented to them during the assessments. The authors concluded that the study may have underestimated feeding disorders in individuals with autism spectrum disorders, but the participant makeup may have overrepresented feeding problems in children with autism spectrum disorders.

II. Assessment

Assessment procedures to diagnose feeding problems in children allow parents and caregivers to begin the process of finding appropriate interventions. Matson and Kuhn (2001) developed the Screening Tool of Feeding Problems (STEP) in order to identify feeding disorders in individuals with developmental disabilities, basing the items on the assessment on current literature on feeding disorders. Categories generated included aspiration risk, selectivity, feeding skills, food refusal related behavior problems, and nutrition related behavior problems. Participants included 570 individuals with mental retardation; participants ranged in age from 10-87 years. Direct-care staff answered the questions on the assessment and the tests were administered by masters' level psychologists. Results indicated that the 8-factor solution constructed was insufficient, and more categories exist than were included in the assessment. The STEP allows trained staff members to identify individuals who have feeding problems or are at risk for developing more serious feeding issues.

Lukens and Linscheid (2008) expanded Matson and Kuhn's (2001) study to assess mealtime problem behaviors in children with autism. The authors designed the Brief Autism Mealtime Behavior Inventory (BAMBI) to introduce a measure that included the specific feeding problems seen in children with autism. The authors also sought to create a standardized measure in studies evaluating effectiveness of dietary treatments for feeding problems in order to unify the existing and future body of literature. Participants in the study included the primary caregivers of 68 children with a caregiver-reported diagnosis of autism or pervasive developmental disorder-not otherwise specified and the primary caregivers of 40 neurotypically developing children between the ages of 3 and 11 years. To confirm that the two groups differed in terms of characteristics related to an autism diagnosis, the GARS Autism Quotient was used

and revealed higher scores for the children in the autism group. Caregivers were asked to complete the Behavioral Pediatric Feeding Assessment Scale (BPFAS), a 35-item standardized report inventory designed to collect information about children's mealtime behavior. The caregiver indicated how often his or her child engaged in a particular eating behavior using a 5-point Likert scale. The BAMBI was initially designed as a 20-item scale used to evaluate the nature of problem behavior during mealtimes. The scale as initially developed comprised a Limited Variety factor and a Food Refusal factor. Results indicated that the 18-item BAMBI was a reliable and valid measure of eating and mealtime problem behaviors.

III. Food Selectivity and Refusal: Assessment and Treatment

Food selectivity and refusal are two of the main feeding problems exhibited by children with autism, and much of the existing literature focuses on these issues. Piazza et al. (2003) applied functional analysis, previously applied to self-injurious behaviors, to inappropriate mealtime behaviors. The motivation for using functional analysis to examine feeding problems was to understand the role that parents' consequences for inappropriate mealtime behaviors has on children's eating patterns. The study was broken into two parts, each with a separate purpose. The purpose of the first study was to conduct naturalistic assessments to develop appropriate hypotheses about behavioral motivators in mealtime behavior. The purpose of the second study was to use experimental functional analysis to identify the effects of the consequences given by the parents to evaluate whether inappropriate behavior improved or worsened during meals. Six children and their parents participated in the first part of the study, and 9 additional children participated in the second part of the study, totaling 15 children in the second part of the study. The participants were all patients in a pediatric feeding disorders program. The children exhibited feeding disorders that resulted in failure to thrive, insufficient nutrition, or severe

behavior problems at mealtimes that interfered with food consumption. Children who could eat foods at a pureed texture or higher were served foods from the standard hospital trays, and children who could only eat baby food were served a variety of jarred baby foods. Foods were selected arbitrarily, regardless of the child's food preferences. The aversive behaviors included batting, gagging, head turning, negative vocalizations, aggression, throwing food, covering face, hand mouthing, and self-injury. In the first part of the study, the experimenters observed parents feeding their children in rooms at the program site. They were instructed to feed the child as they would at home, using similar materials. They were also told to respond to the child's behaviors as they would at home. Results indicated that all parents provided attention in the form of reprimands, soothing comments, or coaxing when their children exhibited inappropriate behavior during mealtimes. Additionally, all parents removed bites of food following inappropriate behavior. Three of the 6 parents provided the child a tangible item when the child exhibited inappropriate behavior. The second part of the study served to identify the functions inappropriate behaviors served. In 10-minute sessions, bites of food were presented to the child every 30 seconds. Trained therapists held a spoon 2.5 cm from the child's lips and instructed the child to "take a bite." One food from each of all four food groups (protein, fruit, vegetable, starch) was offered during each session. Acceptance of bites of food resulted in brief praise across all conditions and presentation of another bite of food at the next 30-second interval. Inappropriate behaviors resulted in one of three types of consequences: negative reinforcement, positive reinforcement in the form of attention, or positive reinforcement in the form of a tangible item, depending on the condition currently being tested. In the escape condition, the therapist removed the spoon of food for the remainder of the 30-second interval if the child engaged in aversive behavior. In the attention condition, inappropriate behavior resulted in brief

attention in the forms of statements of concern and coaxing. The spoon was not removed from its position 2.5 cm from the child's lips. In the tangible items condition, the therapist presented a tangible item when the child exhibited inappropriate behavior. These tangible items included preferred toys, foods, or drinks. During this condition, the spoon was not removed from its position 2.5 cm from the child's lips. Results indicated that each of the children was motivated by escape, attention, tangible items, or a combination of factors. Therefore, functional analysis can be used to identify motivations for inappropriate mealtime behaviors.

Functional analysis provides a background for treatments for children with feeding disorders. Piazza, Patel, Gulotta, Sevin, and Layer (2003) compared the effects of positive reinforcement alone, escape extinction alone, and positive reinforcement and escape extinction in the treatment of feeding problems. Four children diagnosed with a pediatric feeding disorder participated in the study. During eating sessions, acceptance was recorded if the entire amount of food was in the child's mouth within 5 seconds of its presentation. During drinking sessions, acceptance was recorded if any portion of the liquid entered the child's mouth within 5 seconds of its presentation. A multielement design was used to compare levels of acceptance, mouth clean, inappropriate behavior, and negative vocalizations in the escape baseline and differential positive reinforcement for mouth clean plus escape (DRA plus escape) conditions. Additionally, a multielement design was used to compare responses under escape extinction and differential reinforcement for mouth clean plus escape extinction (DRA plus escape extinction) conditions. A reversal design was used to evaluate the presence and absence of escape extinction. Four foods, one from each food group, were presented in random order in each session. In the escape baseline condition, the therapist presented a bite or drink every 30 seconds from the initial acceptance. Brief verbal praise was given if the child accepted the bite or drink within 5 seconds

of the presentation or had a mouth clean. No differential consequences were provided for expulsion or vomiting. If the child engaged in any inappropriate behavior or negative vocalizations during the presentation of food or drink, the spoon or cup was removed for 15 seconds. In the DRA plus escape condition, a reinforcer such as access to preferred toys and attention was delivered after each mouth clean. All other procedures were identical to the escape baseline condition. In the escape extinction condition, inappropriate behavior and negative vocalizations did not lead to escape. These behaviors were blocked, if necessary, to prevent escape from the bite presentation. Parents were asked to choose either physical guidance or nonremoval of the spoon to be evaluated with their children. If the child expelled the food or drink, it was picked up and presented again for 30 seconds. In the DRA plus escape extinction condition, a reinforcer was given to the child following a mouth clean. All other procedures were identical to the escape extinction condition described for each participant. Results indicated that in all cases, positive reinforcement alone was not effective in increasing food consumption. Escape extinction, however, led to increased consumption of food, regardless of whether positive reinforcement was present or absent. DRA, however, was associated with fewer extinction bursts, less crying, and less inappropriate behavior.

Reed et al. (2004) built on previous work to compare escape extinction, noncontingent reinforcement (NCR), and a combination of NCR and escape extinction. Four children admitted to an intensive pediatric feeding disorders day-treatment program participated in the study. Acceptance was scored in each session if the entire amount of food presented was in the child's mouth within 5 seconds of its initial presentation. During drinking sessions, acceptance was recorded if any amount of the liquid presented entered the child's mouth within 5 seconds of the initial presentation. Four foods, one each of fruit, vegetable, starch, and meat, were presented in

random order in each session. All sessions were scheduled to last 5 minutes, but escape extinction sessions occasionally exceeded 5 minutes because the child had to swallow the last bite or drink before the session was ended. During the escape baseline condition, the therapist presented a bite or drink every 30 seconds after the initial acceptance. No differential consequences were given for expulsion or vomiting. If the child held the bite or drink in his mouth 30 seconds after acceptance, the therapist verbally instructed the child to finish the food or drink every 30 seconds until the bite or drink was swallowed. In the NCR plus escape condition, reinforcers such as preferred toys and attention were present throughout the session. The toys remained on the child's tray, and the therapist talked, sang, and interacted with the child throughout the duration of the session. All other procedures were the same as in the escape baseline condition. In the escape extinction condition, the therapist presented a bite of food every 30 seconds following the initial acceptance. Procedures were similar to the previous phase, but inappropriate behavior no longer resulted in escape. If inappropriate behavior or passive refusal occurred, the therapist held the spoon or cup to the child's mouth until he or she took the bite or drink. In the NCR plus escape extinction condition, noncontingent positive reinforcement in the form of preferred toys and attention was provided throughout the session. The toys remained on the child's tray. All other procedures were the same as in the escape extinction condition. Results indicated that in all cases, consumption increased only when escape extinction was used, regardless of whether noncontingent reinforcement was present or absent. Noncontingent reinforcement alone was not associated with decreases in inappropriate behavior, contrary to the suppressive effect of NCR documented in the existing literature.

Freeman and Piazza (1998) treated a 6-year-old girl with destructive mealtime behavior using fading, reinforcement, and escape extinction. The child had previously been diagnosed

with cerebellar atrophy, mild right hemiplegia, autism, and moderate mental retardation. All meals presented during the study were served with other children and staff present at the table. During each baseline meal, the child was given a plate with age-appropriate portions of fruit, protein, starch, and vegetables. If she did not self-initiate food consumption, the therapist provided a verbal prompt indicating that she should take a bite. At least one baseline meal was presented each day. Treatment meals began with a verbal prompt, and if the child did not comply within 5 seconds, the therapist initiated a partial physical prompt. If compliance still was not present, the therapist initiated a physical prompt. Verbal praise was always provided following successful consumption of a bite at any prompting level. Destructive behavior did not result in differential consequences during baseline and treatment meals. At the onset of the treatment, one spoonful of fruit was presented because parental report suggested that fruit was most likely to result in consumption. The amount of presented food was increased in 5% increments of the age-appropriate portions when the child was 80% compliant for 3 consecutive meals. If compliance dropped below 80% for 3 consecutive meals, the amount of food was decreased to the previous level. This procedure was used until the child was consuming 50% of an age-appropriate portion of fruit, at which time a small portion of protein was introduced. The portion of protein was increased similarly. Starch and vegetables were subsequently added in the same way until the child was consuming 50% of an age-appropriate balanced meal. Results indicated that grams consumed increased steadily during treatment. Results also confirm that fading may be a useful treatment for increasing food consumption and food variety.

Najdowski, Wallace, Doney, and Ghezzi (2003) investigated the effects of a parent-conducted functional analysis and treatment comprising differential reinforcement of an alternative behavior, escape extinction, and demand fading on food selectivity in one 5-year-old

child with autism. Before treatment began, he only ate candy, chips, and McDonald's chicken nuggets and French fries. The child demonstrated food refusal behaviors, which were recorded during the functional analysis. In the functional analysis, the child's mother provided antecedents and consequences as instructed by the experimenter. During the no-interaction condition, a plate of one bite each of 5 nonpreferred foods was placed in front of the child while he was left alone at the table. No demands to take a bite or consequences for food refusal were given. During the attention condition, a plate of the same foods was placed in front of the child, but no demands were given. If the child refused to eat the food, the child's mother gave him attention in the form of verbal phrases. During the play condition, a plate consisting of one bite of each nonpreferred food in addition to a plate of high-preference foods were placed in front of the child. Noncontingent positive attention was delivered every 30 seconds, and no consequences were given for food refusal. During the escape condition, a plate of nonpreferred foods was placed in front of the child while demands to take a bite of the food were delivered continuously. Demands were given in a 3-step prompting procedure, which involved an initial prompt to self-feed, a model demonstrating how to take a bite, and a physical prompt. In the treatment phase of the study, a multiple baseline across settings with demand fading was used to investigate the effect of DRA and DRA plus escape extinction plus demand fading. In baseline, each of the five nonpreferred foods was presented one at a time in a trial-by-trial basis by the child's mother, who instructed him to take a bite using the 3-step prompting procedure. Each food was presented only once, and praise was provided following food acceptance. In the DRA condition, the procedure was identical to baseline except that sessions were terminated when either the child accepted a bite of food or 30 minutes had elapsed and the child was told if he ate one bit of food, then he could have a plate full of highly-preferred foods. In the DRA plus escape extinction plus

demand fading condition, session termination was the same as in the DRA condition. The child's mother semirandomly selected one nonpreferred item to present each night so that no nonpreferred food item was presented two nights in a row. The child's mother instructed the child to take one bite while she held the bite within 1 inch of his mouth until either he opened his mouth and she could insert the bite or 30 minutes had elapsed. When the child swallowed the required number of bites for 3 consecutive dinners, the number of swallows necessary to obtain reinforcement was proportionally increased by 50%. A similar procedure was also conducted at the restaurant, in which bites of a hamburger were reinforced with chicken nuggets and French fries. Results indicate that the child exhibited food refusal during the escape condition more than any other condition. The study identified an effective treatment package that can be carried out by parents with little supervision.

IV. Conclusion

The articles reviewed in this paper focus on the prevalence of feeding problems, the assessment and identification of feeding disorders in neurotypical children and children with developmental disabilities, functional analysis for inappropriate mealtime behaviors, and food selectivity and refusal during mealtimes. Feeding problems occur at a much higher rate in children with developmental disabilities, and specifically in children with autism. Due to the severity of consequences of feeding problems in children, including dehydration, malnutrition, and illness, the identification of feeding disorders is important in beginning treatments and interventions for children. Functional analysis allows researchers to connect actions with consequences, leading to explanations for specific behaviors. Children often exhibit such behaviors as expulsion of food, refusal to eat nonpreferred foods, and very specific food selectivity. Treatment packages including techniques such as differential reinforcement of an

alternative behavior, fading, and escape extinction react to children's desire for escape, attention, or a tangible object in order to reduce the aversive behaviors and increase positive mealtime experiences. Feeding occurs multiple times each day, and makes up a large part of the caregiver's interaction with the child. Creating an easier feeding routine and expanding the variety of foods that a child will eat allows for a more relaxed mealtime for both the child and the caregiver. Although this review is not an extensive compilation of all research, it provides an overview of assessment and treatment options for feeding disorders in children with developmental disabilities.

References

Ahearn, W. H., Castine, T., Nault, K., & Green, G. (2001). An assessment of food acceptance in children with autism or pervasive developmental disorder-not otherwise specified. *Journal of Autism and Developmental Disorders*, 31(5), 505-511.

Bruns, D. A. & Thompson, S. D. (2011). Time to eat: Improving mealtimes of young children with autism. *Young Exceptional Children*, 14(4), 3-18.

Field, D., Garland, M., and Williams, K. (2003). Correlates of specific childhood feeding problems. *Journal of Paediatrics and Child Health*, 39(4), 299-304.

Freeman, K. A. & Piazza, C. C. (1998). Combining stimulus fading, reinforcement, and extinction to treat food refusal. *Journal of Applied Behavior Analysis*, 31(4), 691-694.

Keen, D. V. (2008). Childhood autism, feeding problems and failure to thrive in early infancy. *European Child & Adolescent Psychiatry*, 17(4), 209-216.

Kodak, T., & Piazza, C. C. (2008). Assessment and behavioral treatment of feeding and sleeping disorders in children with autism spectrum disorders. *Child and Adolescent Psychiatric Clinics of North America,* 17, 887-905.

Lukens, C. T. & Linscheid, T. R. (2008). Development and validation of an inventory to assess mealtime behavior problems in children with autism. *Journal of Autism and Developmental Disorders*, 38(2), 342-352.

Matson, J. L. & Kuhn, D. E. (2001). Identifying feeding problems in mentally retarded persons: development and reliability of the screening tool of feeding problems (STEP). *Research in Developmental Disabilities*, 21, 165-172.

Najdowski, A. C., Wallace, M. D., Doney, J. K., & Ghezzi, P. M. (2003). Parental assessment and treatment of food selectivity in natural settings. *Journal of Applied Behavior Analysis*, 36(3), 383-386.

Piazza, C. C., Fisher, W. W., Brown, K. A., Shore, B. A., Patel, M. R., Katz, R. M., … Blakely-Smith, A. (2003). Functional analysis of inappropriate mealtime behaviors. *Journal of Applied Behavior Analysis*, 36(2), 187-204.

Piazza, C. C., Patel, M. R., Gulotta, C. S., Sevin, B. M., & Layer, S. A. (2003). On the relative contributions of positive reinforcement and escape extinction in the treatment of food refusal. *Journal of Applied Behavior Analysis*, 36(3) 309-324.

Reed, G. K., Piazza, C. C., Patel, M. R., Layer, S. A., Bachmeyer, M. H, Bethke, S. D., & Gutshall, K. A. (2004). On the relative contributions of noncontingent reinforcement and escape extinction in the treatment of food refusal. *Journal of Applied Behavior Analysis*, 37(1), 27-42.

Schreck, K. A., Williams, K., & Smith, A. F. (2004). A comparison of eating behaviors between children with and without autism. *Journal of Autism and Developmental Disorders*, 34(4), 433-438.