Training Caregivers to Implement a Structured Meal Protocol to Decrease Food Selectivity Among Young Children with Autism

by

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Abstract

Title: Training Caregivers to Implement a Structured Meal Protocol to Decrease Food Selectivity Among Young Children with Autism

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This study evaluated a method of training caregivers to implement the Structured Meal protocol to treat children with autism who exhibit food selectivity. A treatment package consisting of written instructions and video modeling as well as in-vivo prompting and feedback (when necessary) was used to teach participants to conduct the protocol. A multiple baseline design across participants was used to evaluate the effects of training. In addition to the primary dependent variable (i.e., correct caregiver implementation of the Structured Meal protocol), data on three secondary dependent variables (i.e., child bite acceptance, mouth cleans, and inappropriate mealtime behavior) were collected. Results showed that instructions and modeling were effective to achieve the mastery criteria for one participant, with the other two participants needing in-vivo prompts and feedback. Two of the children exhibited an increase in quick bite acceptances using the Structured Meals protocol.
# Table of Contents

List of Keywords .................................................................................................................. vi
List of Figures ..................................................................................................................... vii
Acknowledgements ............................................................................................................ viii
Dedication ............................................................................................................................. ix

**Introduction** .................................................................................................................. 1
  Non-Behavior Analytic Approaches to the Treatment of Feeding Disorders ............. 2
  Behavior Analytic Approaches to the Treatment of Feeding Disorders ................. 4
  Food Selectivity .................................................................................................................. 8
  A Non-Escape Extinction Intervention to Address Food Selectivity ..................... 13

**Method** ......................................................................................................................... 15
  Participants ....................................................................................................................... 15
  Settings & Materials ....................................................................................................... 18
  Assessment ....................................................................................................................... 19
  Dependent Variables & Interobserver Agreement ..................................................... 20
  Experimental Design ....................................................................................................... 22
  Procedure ......................................................................................................................... 23

**Results** .......................................................................................................................... 27
  Caregiver Training .......................................................................................................... 27
  Quick Acceptance ........................................................................................................... 28
  Mouth Cleans ..................................................................................................................... 29
  IMTB .................................................................................................................................. 29
  Social Validity .................................................................................................................... 30

**Discussion** ...................................................................................................................... 31
  Limitations ......................................................................................................................... 38
  Future Research ............................................................................................................... 39
<table>
<thead>
<tr>
<th>References</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A Structured Meal Protocol Data Sheet</td>
<td>52</td>
</tr>
<tr>
<td>Appendix B Social Validity Questionnaire</td>
<td>53</td>
</tr>
<tr>
<td>Appendix C Structured Meal Protocol</td>
<td>54</td>
</tr>
<tr>
<td>Appendix D Structured Meal Main Components Sheet</td>
<td>56</td>
</tr>
<tr>
<td>Appendix E Cheat Sheet</td>
<td>60</td>
</tr>
</tbody>
</table>
List of Keywords

Autism
Caregiver Training
Food Selectivity
Written Instructions
Structured Meal Protocol
Video Model
List of Figures

Figure 1 — Percentage of Steps Implemented Correctly Results..................................47
Figure 2 — Quick Acceptance Results. ........................................................................48
Figure 3 — Mouth Clean Results. ................................................................................49
Figure 4 — Inappropriate Mealtime Behavior Results...............................................50
Figure 5 — Federal Food Group Recommendations..................................................51
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Dedication

To the advancement of science, my mom, and my dad.
Introduction

Training Caregivers to Implement a Structured Meal Protocol to Decrease Food
Selectivity Among Young Children with Autism

Feeding disorders are diagnosed when a child’s behavior, despite the
caregiver’s attempts, results in a failure of the child to eat sufficient quantities or
types of food to sustain body weight, meet nutritional needs, and/or grow. Feeding
issues have been identified in up to 25% of typically developing children (Marshal,
Ware, Hill, and Dodrill, 2014). In addition, upwards of 90% of children with
autism spectrum disorder (ASD) will present feeding issues in the form of
pickiness, refusal, and problem behavior when eating (Volkert & Vaz, 2010).
According to Piazza (2008), a feeding disorder is a heterogeneous set of problems
that may include inadequate caloric and nutritional intake, growth failure, skill
deficits, oral motor deficits, and/or behavior problems. Many studies, books, and/or
articles in the published literature suggest feeding problems result from a
combination of medical, oral-motor, and behavioral issues. Feeding problems have
typically been organized into several different categories depending on the type of
issue presented by the individual. Two of the most common forms of feeding
disorders are food selectivity and food refusal. Fields, Garland, and Williams (2003) described the characteristics of these two categories by defining food refusal as encompassing the refusal to eat all or most foods, such that the child fails to meet their caloric or nutritional needs and categorized food selectivity into two sub-types. These two sub-types described individuals who either eat a narrow range of food that is nutritionally inappropriate or refuse to eat certain food textures that are developmentally appropriate.

**Non-Behavior Analytic Approaches to the Treatment of Feeding Disorders**

Interventions for the treatment of these pediatric feeding disorders have been developed across multiple fields of study targeting both refusal of foods and food selectivity. Burklow, Shultz, McConnel, & Rudolf (1998) classified children with complex pediatric feeding disorders and concluded that a majority of the 103 children included in their study presented a behavioral component to their feeding issues regardless of concurrent physical factors. These authors suggested that regardless of how the biological and behavioral aspects interact, both need to be targeted for treatment.

Sequential Oral Sensory is one treatment for feeding disorders that is used across many clinical settings (Benson, Parke, Gannon, & Munoz, 2013). This approach incorporates a 12-week program that utilizes systematic desensitization and play as major components of the treatment (Peterson, Piazza, & Volkert, 2016).
In this type of treatment, the therapist introduces different foods to the child using six steps. These steps include visual tolerance, interaction with the food, smell, touch, taste, and eating the food. The focus of this treatment is to induce relaxation towards food. If at any point in the treatment, the child becomes upset, the therapist removes the food and returns to a previous step in the hierarchy in which food was tolerated.

Other approaches to feeding disorders propose that the infant-parent relationship is key and suggest treatment through therapeutic play with infant-parent psychotherapy. Jordan (2012) describes current evidence in cognitive psychology that suggests that the infant’s cognition is not incorporated in behavioral treatments which is why, the author suggests, behavioral approaches may be less effective than they could be. Jordan used a therapeutic approach to feeding disorders incorporating the infant’s “ideas” of feeding. Key elements of this psychotherapy included treating the infant as an equal partner in the dyad during therapy and working to create an emotional connection with the infant. Some psychiatrists who have examined pediatric food selectivity describe it from a viewpoint of a strong aversion to taste, texture, temperature, and other sensory issues (Chatoor, 2009). Although there are other proposed approaches to treating feeding issues, the bulk of the research on interventions is behavior analytic.
Behavior Analytic Approaches to the Treatment of Feeding Disorders

Behavioral treatment of pediatric feeding disorders has a large degree of empirical support. Within behavior analysis there has been an increasing amount of research examining treatments to address food refusal as well as food selectivity, with many approaches showing favorable outcomes. The most common procedure within behavior analysis for the treatment of feeding disorders is escape extinction.

**Escape extinction.** Escape Extinction (EE) is an effective treatment and often the default procedure when addressing pediatric feeding disorders. EE is a term used to describe procedures that prevent the child from accessing escape from the feeding situation. These procedures include holding the spoon at the child’s lips until the child accepts the bite or the food is placed in the child’s mouth (Ahearn, Kerwin, Eicher, Chantz, & Swearingin, 1996; Cooper et al, 1995; Kerwin, Ahearn, Eicher, and Burd, 1995; Patel, Piazza, Martinez, Volkert, & Santana, 2002; Piazza, Patel, Gulotta, Sevin, & Layer, 2003; Reed et al, 2004). There have been many studies that support the use of EE to increase bite acceptance. EE eliminates the contingency between the behavior and its reinforcer, which in the case of feeding disorders, is inappropriate mealtime behavior and escape from eating. Hoch, Babbitt, Ccoe, Krell, and Hackbert (1994) combined both positive reinforcement and escape extinction to treat food refusal. In their study, escape extinction was referred to as contingency contacting and they found that positive reinforcement, by
itself, only slightly increased bite acceptance and did not influence negative vocalizations. Contingency contacting quickly increased acceptance and decreased both negative vocalizations and child interruptions. Patel et al. (2002) evaluated two differential reinforcement procedures in combination with escape extinction to treat food refusal. They found that when implemented alone, the differential reinforcement procedures were not as effective at increasing mouth cleans and acceptance across food, once again supporting the use of EE to treat feeding disorders.

Although EE has been shown to be effective for the treatment of feeding issues it can have many unwanted side effects. These side effects include extinction induced variability within behavior, aggression, and emotional behavior. Hoch et al. (1994) stated that potential procedures such as contingency contacting could exacerbate feeding difficulties and health risks, as well as result in low parental approval and probability of implementation. For some caregivers, seeing their child engage in behaviors that they have not seen before, that may have arisen due to the escape extinction procedure, can be hard to observe and even harder to manage. Due to these unwanted side effects, there is a potential that some caregivers may drop out of EE-based treatment before significant clinical outcomes can be reached. In addition, if parents are not going to implement the procedure beyond the clinic, then there is no use in implementing this procedure at all because the effects will
not maintain. EE can also produce side effects that have sometimes been compared to those produced by punishment procedures. Often, escape extinction is the default procedure within feeding programs due to time constraints and to the high success rate of the procedure. However, if other less intensive, less intrusive procedures are available to clinicians that don’t pose the same risks as EE, it would seem a logical step to begin treatment of this type prior to more invasive treatments.

**Noncontingent Reinforcement and Differential Reinforcement.**

Noncontingent reinforcement (NCR) and differential reinforcement of alternative behavior (DRA) are two frequently used treatments within the feeding literature. Allison, Wilder, Chong, Lugo, Pike, and Rudy (2012) compared NCR and DRA in the treatment of food selectivity in combination with escape extinction and showed that both procedures were equally effective in increasing bite acceptance and decreasing problem behavior. NCR and DRA are typically associated with decreases in inappropriate mealtime behavior, but not with increases in bite acceptance. Seubert, Fryling, Wallace, Jiminez, and Meier (2014) reviewed antecedent interventions for pediatric feeding disorders and showed that antecedent interventions when paired with EE enhanced EE by 67% in participants with total food refusal. They also showed that antecedent interventions (including NCR) that worked independently from EE were only successful with participants diagnosed with food selectivity. They report that it is unclear why antecedent interventions are
not evaluated alone more frequently, as these interventions are typically evaluated with EE.

The High-Probability Sequence. Meier, Fryling, and Wallace (2012) examined the high-probability instructional sequence as a treatment for food selectivity. This study looked at one 3-year-old girl with autism and used a nonconcurrent multiple baseline and reversal design across foods. The authors had the parents of the participant identify a few preferred foods as well as a few foods that the child typically avoided. The high preference foods served as the high-probability items while the foods that were typically avoided served as the low-probability items.

The results of this study were favorable for the high-probability sequence when used to treat food selectivity. The participant increased acceptance of one of his low-probability foods (plums) from 10% in baseline to a mean acceptance of 93% in the first intervention phase and again to 98% during the second intervention phase.

The implementation of the high-probability sequence has been examined in several studies before Meier et al. (2012). Dawson, Piazza, Sevin, Gulotta, Lerman, and Kelley (2003) looked at the high-probability sequence and EE with a child with food refusal and showed that the high-probability intervention was not effective at increasing acceptance, but that escape extinction was effective regardless of
whether the high-probability intervention was also applied. They replicated the results of Zarcone, Iwata, Mazaleski, and Smith (1994) by demonstrating that positive reinforcement of acceptance competed with the negative reinforcement of escape.

Patel, Reed, Piazza, Bachmeyer, Layer, and Pabico (2006) and Patel, Reed, Piazza, Mueller, Bachmeyer, and Layer (2007) also examined the high-probability sequence to increase bite acceptance with EE and in the absence of EE. These studies showed the success of the high-probability sequence when targeting food acceptance. The authors demonstrated that the high-probability sequence was successful to increases bite compliance without EE, which previously was not supported in the literature.

**Food Selectivity**

The studies described above focused on food refusal. Food selectivity, another feeding disorder, has received relatively little research attention. Food selectivity is a type of feeding disorder which applies to children and adults who eat an insufficient variety of foods. These children/adults typically do not eat a well-balanced diet which can result in further medical problems if left untreated. Although a general understanding of food selectivity exists, various disciplines have defined the disorder differently and most of the literature on food selectivity
within the behavioral sciences have included participants with what might be described as “severe” cases.

The federal government recommends that both male and female children between the ages of 2-10 years consume 1,000 to 1,600 calories if they live a sedentary lifestyle. The government also recommends that children eat a variety of foods from five food groups: vegetables, protein, fruit, grains, and dairy. The amount of food in each food group varies based on age (Dietary Guidelines for Americans, Health.gov; See figure 5). It is important to take these recommendations into consideration when defining and treating children with food selectivity.

Penrod, Gardella, and Fernand (2012) conceptualized food selectivity as a form of noncompliance in which the child refuses to eat a sufficient variety of food. They suggest that children who display this type of feeding disorder often maintain their weight by consuming preferred foods, but that these preferred foods provide an inadequate daily nutritional value. This article also states that although feeding disorders may vary among individuals, there are several environmental factors that may contribute to food selectivity and other types of feeding disorders. Freeman and Piazza (1998) note that positive reinforcement in the form of parental attention and negative reinforcement in the form of escape from nonpreferred foods can be a cause of continued food selectivity.
Wilson (1994) reports that food selectivity is a commonly reported problem in children. Palmer and Horn (1978) noted that “bizarre feeding habits” were reported in 23.4% of the 500 patients seen in a nutrition division of a hospital over a 4-year period, but these figures are on the low end as they only represent patients who sought professional help for their feeding issues. There could be a much larger population of individuals suffering from milder cases of food selectivity that may not qualify for intensive day treatment in a clinic. Piazza et al. (2002) note that often, medical doctors suggest waiting to see if the child’s pickiness will subside in time, but this approach imposes the same medical risks that were suggested earlier. Children who display this pickiness, or food selectivity, are at a much higher risk of further medical difficulties due to their lack of nutritional intake and variety of foods consumed. These issues include intestinal complications, failure to thrive, diabetes, and other conditions.

Seiverling, Williams, Sturmey, and Hart (2012) defined food selectivity as consumption of a narrow range of foods and stated that this type of feeding disorder is rather prevalent in children diagnosed with ASD. Matson and Fodstad (2009) found that children who are diagnosed with ASD often display some form of food selectivity. They state that children with ASD eat approximately half the number of dairy items, fruits, proteins, and vegetables eaten by children without ASD.
Two well-known feeding clinics exist in the United States. These are affiliated with the Munroe-Meyer Institute (MMI) and the Kennedy-Krieger Institute (KKI). MMI’s Dr. Peterson noted that within her clinic, they have not operationally defined/differentiated between severe, moderate, or mild food selectivity. She did further elaborate that a child is diagnosed as severely food selective if they consume more than 3 foods but less than 20, disregarding any “junk foods.” (Personal communication, February 14th, 2018). Furthermore, Dr. Lesser at KKI described a “severe” case of food selectivity as a child who eats 5 or fewer total foods, while also considering any foods that may have been eliminated from the diet in the past 6 months (Personal communication, February 2nd, 2018).

With differences in the classification of the severity of food selectivity at top feeding clinics as well as a failure to address different levels of food selectivity in the literature, there is a large population of individuals with feeding difficulties who are not being fully served. It is important to specifically define the components that distinguish “mild” food selectivity from a more “severe” case. Food selectivity can be a cause for concern from the child’s own health as well as a cause of concern for the child’s family. If the child presents limited food intake, then “severe” food selectivity should be targeted. However, more “mild” cases of food selectivity should also be targeted for improvement.
According to the literature, “picky eating” is a topic of interest across many areas of study. A clear distinction between a “picky eater” and a child with food selectivity has not been made, but the two are related. Bandini et al. (2010) use food selectivity and “picky eating” interchangeably and stated that assessment of a child who is a “picky eater” typically consists of a parent reporting the picky eating behaviors.

Bandini et al. (2010) attempted to operationally define food selectivity by incorporating three domains: 1) food refusal 2) limited food repertoire and 3) high frequency single food intake. They assessed food refusal as the absolute number of foods the parent indicated the child would not eat, as well as the percentage of foods the child did not eat relative to the number of foods offered. They used the high frequency single food intake to assess if any foods were eaten 4-5 times a day. They looked at the limited food repertoire of the child by coding a three-day food log using a computer software program. Through their research they determined that there was increased food refusal and more limited food repertoires in children with ASD, but food refusal was seen in both children with ASD and typically developing children. They also were able to show that “growing out of pickiness” was often not the case. Bandini, Curtin, Phillips, Anderson, Maslin, and Must (2017) replicated these findings. These papers support the importance of focusing on this population and the need for more empirical research on “picky eating.”
Given that research on food selectivity has been neglected and the sometimes-severe side effects produced by EE for food refusal, treatments for mild food selectivity are needed. One non-escape extinction procedure has been shown to effectively treat food selectivity without the side effects of EE.

**A Non-Escape Extinction Intervention to Address Food Selectivity**

The non-escape extinction procedure used in the current study is entitled “Structured Meal”. Structured Meal consists of environmental manipulations that provide structure to the meal block, which may evoke appropriate mealttime behaviors. Its main component is differential reinforcement of alternative behavior for the acceptance of bites.

Werle, Murphy, and Budd (1993) evaluated the effects of the Structured Meal protocol. Werle et al. taught parents to provide direct, clear prompts, and to use verbal and physical praise, as well as other rewards such as a preferred food or an interactive game contingent on appropriate eating. Parents in this study were also taught when to ignore disruptive behaviors. Werle et al. examined both parent and child behaviors; their dependent variables were mean number of parent-delivered trained prompts versus vague prompts, as well as number of child bites taken. The results of this study support the use of the Structure Meal protocol by showing that the number of fruits and dairy solids swallowed increased compared to baseline levels. The study also showed that the Structured Meal protocol was
successful at increasing self-feeding across participants (i.e., the child feeding themselves).

It is important to begin studying resource-light training methods for pediatric feeding disorders in order to increase the number of participants who receive behavioral feeding services. More often than not, clinics have long waitlists and are unable to accept all cases. Although one study (Werle et al., 1993) evaluated the Structured Meal procedure and found it to be effective, no study examined at whether the Structured Meal protocol can be successfully taught to caregivers with a high percentage of procedural integrity. Thus, the purpose of this study was to evaluate written instructions and video modeling to train caregivers to implement the Structured Meal treatment.
Method

Participants

This study employed 3 child participants who had a diagnosis of ASD, as well as one caregiver per child. The children in this study met the criteria for food selectivity. For the current investigation, a child with food selectivity was defined as an individual who consumed fewer than 6 proteins, 6 starches, 6 fruits, and 6 vegetables. These numbers excluded sweets and foods labeled as “junk food”. One caregiver of each child dedicated one hour, for at least 2 days a week, to act as the feeder in the clinic at which caregiver training sessions were conducted.

Phil was a 4-year and 7-month-old male who was 38 inches tall and weighed 37 pounds. Phil’s caregiver categorized Phil as having moderately severe food selectivity. Phil received most of his nutritional needs orally from solid foods. Phil was not seeing a dietician/nutritionist for his food selectivity and did not have any medical concerns that would affect his eating. Phil’s caregiver reported that their daily routine was consistently altered in order to help Phil eat.

The results of the assessment (described in detail below), Food Selectivity & Consumption Assessment Tool (FSCAT) showed the proteins Phil ate were chicken tenders/nuggets, grilled cheese, mac and cheese, and peanut butter and jelly. The FSCAT showed the proteins Phil used to eat were grilled chicken, string cheese, turkey, eggbeaters, yogurt, and meatballs. These proteins had all been
eliminated from his diet 1-2 years before the study began. The fruits Phil ate were honeydew melon and watermelon. Phil had eliminated banana, applesauce, strawberry, blueberry, pineapple, and grape from his diet between 6 months and 2 years before the study began. The starches Phil consumed were bread, crackers, French fry, pancake, and French toast. The starches recently eliminated from Phil’s diet were oatmeal, sweet potatoes, waffles, rice, and lasagna, which had been eliminated 6 months to 3 years before the study began. For liquids, Phil consumed 2% milk, chocolate milk, apple juice, grape juice, sweet tea, Gatorade™, Kool-aid™, and soda. Phil did not consume any vegetables. Phil scored a 23.73 on the FSCAT. Phil’s score categorized him as a child with severe food selectivity prior to the study.

Stacey was a 3-year and 3-month-old male who was 39 inches tall and weighed 35 pounds. Stacey’s caregiver categorized Stacey as having moderate food selectivity. Stacey received most of his nutritional needs orally from solid foods. Stacey consumed solid foods in table texture formats. Stacey was not seeing a dietician/nutritionist for his food selectivity and did not have any medical concerns that would affect his eating. His caregiver reported that his food selectivity caused changes in their day-to-day routines.

The results of the FSCAT showed the proteins that Stacey ate were chicken tenders/nuggets, string cheese, steak, scrambled eggs, and sausage (patties) without
problem behavior. The FSCAT showed that Stacey had eliminated black beans, lentils, grilled chicken, hamburger, hot dogs, and meatballs from the protein food group 3 months to 1 year before the study began. The only fruit that Stacey consistently consumed was apple. Stacey consumed carrot, green bean, and broccoli from the vegetable group. The FSCAT showed that Stacey consumed bread (Italian bread only), crackers, French fries, pasta, and rice without problem behavior for the starch food group. The liquids Stacey consistently consumed were milk and Gatorade™. Stacey scored a 36.21 on the FSCAT. Stacey’s score categorized him as a child with moderate food selectivity prior to the study.

Jack was a 6-year and 10-month-old male who was 43 inches tall and weighed 38 pounds. Jack’s caregiver categorized Jack as having severe food selectivity. Jack received most of his nutritional need orally from pureed solids. Jack was not seeing a dietician/nutritionist for his food selectivity and had no medical concerns that would affect his eating. His caregiver reported that Jack’s food selectivity constantly altered their daily routine. Jack was receiving feeding services by a Board Certified Behavior Analyst (BCBA™), which did not affect this study.

The results of the FSCAT showed the proteins that Jack consumed consistently were black beans, ground hamburger, and yogurt with no recently eliminated foods. The fruits that Jack consumed were applesauce; pears were
eliminated from his diet a year before the study began. The vegetables in Jack’s diet were carrot and green bean. For starch, Jack consumed oatmeal, rice, and pasta. The liquids that Jack consistently consumed were vanilla Pediasure™, and whole milk. Jack scored a 19.20 on the FSCAT. Jack’s score categorized him as having severe food selectivity prior to the study.

It is important to note that Jack was receiving feeding services at the time of the current study. Prior to inclusion into the current investigation, the feeding protocols being conducted with Jack at his other clinic were analyzed to determine if they would affect experimental control or his participation in the study. Due to the differences in his feeding protocols with the Structured Meal protocol, it was determined that there would be no risk for the current investigation or his clinical progress; thus, Jack was included in the study.

**Settings & Materials**

Data were collected in a day treatment facility serving children with ASD (The Scott Center for Autism Treatment). All sessions were conducted in a small treatment room equipped with a one-way mirror that was connected to an observation room where data collection occurred. Inside the treatment room was a table, 3 chairs, any food and feeding utensils needed for the procedure, a scale, tangible items, and timers. Inside the observation room the therapist collecting data used a pen, paper for data collection, a timer, and a video camera.
Sessions were conducted by a therapist providing direct, immediate feedback for caregiver training (if in-vivo prompting and feedback was required). All sessions were recorded on a video camera. A trained therapist scored all sessions for primary data. A second data collector collected interobserver agreement data on at least 33% of sessions. The data collectors collected data on the videos in a separate room.

**Assessment**

Prior to conducting sessions, caregivers participating in this study were asked to complete an assessment created by the first author. The assessment was the Food Selectivity & Consumption Assessment Tool (FSCAT; available upon request). This assessment included questions pertaining to the “severity” of the child’s food selectivity (e.g., what does the child eat, what does the child not eat, when did the child stop eating a certain food, how long ago did the child eliminate said food from their diet, what foods does the parent wish the child would eat, etc.). This assessment provided information about current foods and food history for the first author to determine which foods to target for the study. It also provided detailed information on the level of food selectivity at which the participants presented prior to the study. Severe food selectivity was categorized with a score of 0-25, moderate food selectivity was categorized with a score of 25.1 – 75, and mild food selectivity was categorized with a score of 75.1 – 150. The answers to this
assessment also provided a summary of similarities and differences among participants.

**Dependent Variables & Interobserver Agreement**

The main dependent variable (DV) of interest for this study was the percentage of protocol steps that caregivers performed accurately during sessions. The Structured Meal protocol included a data sheet (see Appendix A) that highlighted the most important aspects for implementing the procedure. The therapist used these data sheets to collect data during sessions. These data sheets listed 10–20 components or steps per protocol that were scored as implemented correctly or incorrectly across each session. The percentage was then calculated from the number of components performed accurately divided by the total number of components for the current protocol/checklist being conducted for the session. Decisions regarding phase changes were based solely on the main dependent variable: percentage of protocol steps performed correctly.

This study also included three secondary dependent variables that focused on clinical outcomes of the child participants. These variables were quick bite acceptance, IMTB, and mouth cleans. Quick acceptance was defined as the child actively lifting the feeding utensil and depositing the entire bolus (except for food the size of a pea or smaller) pass the plane of the lips, without IMTB. Data were collected on the number of quick acceptances per session. IMTB was scored as any
instance in which: 1) the child made contact with the therapist’s feeding utensil, hand, or arm (from elbow down) while the bolus was within arm’s reach of the child, 2) the child turned his or her head 45 degrees from the position of the bolus while the bolus was within arm’s reach, 3) the child turned his or her body 90 degrees from the position of the bolus when the bolus was within arm’s reach, and 4) the child pushed the therapist’s feeding arm 2 inches or more from the original presentation position. Mouth Cleans were defined as no more than the size of a pea of food remaining in the child’s mouth when checked by the feeder. Quick acceptance and mouth clean were converted into a percentage per session by dividing the number of quick acceptances by the total number of bites per session (5) and multiplying by 100. IMTB was converted to a rate by dividing the total count of IMTB by the total duration that the bolus was within arm’s reach (divided by 60) of the child. The main DV and the secondary DVs were scored using the data sheets.

A second data collector collected interobserver agreement (IOA) data on at least 33% of sessions during each phase of the study. To calculate IOA for the percentage of protocol steps that caregivers performed accurately as well as for quick acceptance and mouth cleans, a trial-by-trial method was used in which the smaller count was divided by the larger count of data, multiplied by 100, for each session. IOA for IMTB was calculated using the smaller duration between the
observers, divided by the larger duration, and then multiplied by 100 to obtain an interval-by-interval calculation.

Mean interobserver agreement across participants was 91% (range, 85% - 95%) for steps implemented correctly, 93% (range, 90% - 96%) for quick acceptances, 97% (range, 95% - 100%) for mouth cleans, and 87% (range, 82% - 93%) for IMTB. For Phil, interobserver agreement was 85% for steps implemented correctly, 90% for quick acceptances, 95% for mouth cleans, and 82% for IMTB. For Stacey, interobserver agreement was 93% for steps implemented correctly, 96% for quick acceptances, 95% for mouth cleans, and 87% for IMTB. For Jack, interobserver agreement was 95% for steps implemented correctly, 98% for quick acceptances, 100% for mouth cleans, and 93% for IMTB.

This study measured social validity by providing a brief questionnaire (see Appendix B) to all parents of participating children following the study, which asked questions such as the following: Did you feel that you were provided enough information to implement the protocol? Do you feel that the protocol is something reasonable to implement in other settings? Did you feel that the protocol was easy to learn?

**Experimental Design**

A non-concurrent multiple baseline design across participants was used to evaluate the effects of training which included written instructions and video
modeling, as well as in-vivo prompting and feedback, if required. A non-concurrent multiple baseline design was also used across all secondary dependent variables.

Procedure

Structured Meal. This procedure included the implementation of a timer, specific prompts and praise, differential reinforcement of alternative behavior, mouth clean checks, and additional environmental organization (see below) to meals. Prior to each session, caregivers were instructed to conduct a multiple stimulus without replacement preference assessment (DeLeon & Iwata, 1996), consisting of three toys. The child then chose one tangible item which was delivered contingent on engaging in a quick acceptance for that trial of food.

Caregivers presented a total of 5 bites per session with approximately 30 s between each bite. The caregiver presented the bite to the child by placing the bite of food on a utensil, placing the utensil in a bowl, and placing the bowl in front of the child and prompting, “take a bite”. If the child took the bite within 8 s of presentation, the caregiver provided brief verbal praise, “good job taking your bite,” and they provided the tangible item that was chosen during the mini-preference assessment. The caregiver then provided an additional 30 s to swallow, at which time, they removed the item and prompted the child to “show me ahh,” and proceeded to check the mouth to see if the child had swallowed. If the child had swallowed all of the bite with the exception of the size of a pea or smaller, the
caregiver provided brief verbal praise (e.g., “good job swallowing”). If the child did not meet the definition of mouth clean, the caregiver provided a prompt to finish swallowing and moved to presenting the next bite. The caregiver then proceeded to the next bite in the session following this format until all 5 bites had been taken. If the child packed 3 bites (i.e., all three bites remained in the mouth), the feeder did not move to the next bite presentation, but instead, continued to provide swallow prompts every 30 s until at least one of the bites was swallowed. The feeder then moved to present the next bite in the session.

If the child did not accept the bite following the initial 8 s after presentation, the caregiver did not provide praise. The bite remained in the original location of presentation for the remainder of the 30 s interval. Once this interval elapsed, the bite was removed, and the next bite was presented.

In this procedure, the caregiver presented 4 foods per meal block with each food consisting of a different food group (i.e., fruit, starch, protein, and vegetable). During a meal block, the caregiver presented one bite of each food with the last bite being the presentation of the first bite in the series, rotating through the foods and beginning the following session with a different first bite. This procedure utilized a consistent spoon so that all bites presented were the exact same size, eliminating the potential for variability in bite sizes across sessions. The caregiver discontinued providing extra attention for certain unwanted behaviors during mealtimes.
Behaviors that no longer produced attention include coughing, gagging, vomiting, crying, hitting, and other topographies of inappropriate mealtime behaviors.

**Training.** Caregivers were trained by the first author of the study. Training consisted of 3 phases. The initial phase was baseline in which caregivers conducted a feeding session without any information provided, the second phase consisted of written instruction and video modeling, and the final phase, if needed, was prompting and feedback during meal blocks. The author of the study began the training with the caregiver following the baseline phase.

A binder consisting of the written instructions of the current protocol was provided to each caregiver 3 days prior to when they were scheduled to conduct the treatment protocol (all participants received the same length of review with the binder prior to starting the treatment). The duration of 3 days exposure to the training binder allowed the caregivers to read through the binder and watch the videos in order to provide time to adequately learn the steps within the protocol. Within the binder, the caregiver received written instructions for the protocol along with a list of links that consisted of video models previously uploaded to YouTube™. These videos consisted of the first author modeling steps of the protocol for the caregiver to review outside of session. The binder also provided a checklist of important components within the protocol for the caregiver to utilize during sessions. The purpose of providing a binder for caregivers to review at home
was to simulate the use of indirect training techniques that a clinic may use when working with clients who need feeding services but are placed on a waitlist. Caregivers were instructed to not practice the protocol independently in the home (See appendix C-E).

The last phase, if needed, consisted of the first author providing prompting and feedback to the caregiver during sessions. Prompting and feedback consisted of the first author sitting in the room with the caregiver during meal blocks and providing prompting and direct feedback during and following each session, based on the caregiver’s performance. This prompting and feedback was similar to the caregiver training that is typically done in a clinical treatment feeding program. The mastery criterion for treatment was 3 consecutive sessions at 80% or higher for the main DV.
Results

Caregiver Training

Figure 1 depicts the percentage of steps implemented correctly across all caregivers. During baseline, Phil’s caregiver implemented the protocol with low integrity across all sessions ($M = 1.39\%$ of steps implemented correctly). Following access to the resource-light materials for 3 days, the percentage of caregiver steps implemented correctly increased to moderate levels ($M = 32.09\%$ of steps implemented correctly). Phil’s caregiver required a third phase of in-vivo prompts and feedback. During this phase, the caregiver met mastery criteria for the primary DV, averaging 95.45\% steps implemented correctly within the first 3 sessions.

During baseline, Stacey’s caregiver implemented the correct steps of the protocol at low integrity ($M = 1.52\%$ of steps implemented correctly). Following access to the resource-light materials, Stacey’s caregiver’s correct steps increased to near mastery criteria during phase 2. The caregiver’s average was 71.57\% steps implemented correctly using only resource-light materials, however, the mastery criteria was not met so further training was necessary. During phase 3, Stacey’s caregiver began to implement the protocol with high integrity ($M = 95.12\%$) and met mastery criteria within the first 3 sessions. A fourth session was conducted due to a downward trend in phase 3.
During baseline, Jack’s caregiver implemented the correct steps of the protocol at low integrity ($M = 1.73\%$ of steps implemented correctly). Following access to the resource-light materials, Jack’s caregiver’s correct steps increased and met mastery criteria within the first 3 sessions. The caregiver’s average percentage of steps implemented correctly was $93.94\%$ across all three sessions. Jack’s caregiver did not need additional training to master the protocol.

**Quick Acceptance**

Figure 2 depicts the percentage of quick acceptances across participants. During baseline, Phil engaged in zero quick acceptances. Phil did not engage in any quick acceptances across both training phases. Phil did not accept any bites during the study regardless of quick or delayed acceptances (i.e., bites taken following 8 seconds, or bites accepted within 8 seconds following any IMTB).

During baseline, Stacey engaged in zero quick acceptances. In the first phase of training, Stacey’s quick acceptances increased to variable levels ($M = 66.44\%$). During phase 3, Stacey’s quick acceptances rose to clinically significant levels (i.e., 3 consecutive sessions at 80\% or higher; $M = 75\%$).

During baseline, Jack engaged in variable levels of quick acceptances, ranging from moderate to high levels ($M = 77.78\%$). During the resource-light training phase, Jack’s level of quick acceptance rose to high levels for all sessions ($M = 100\%$).
**Mouth Cleans**

Figure 3 depicts the percentage of mouth cleans across participants. Phil did not accept any bites across all sessions of the study, resulting in no opportunities to engage in a mouth clean.

During baseline, Stacey did not engage in any acceptances resulting in no opportunities to engage in a mouth clean. During phase 2, Stacey engaged in moderate levels of mouth cleans ($M = 60.89\%$). During the final phase, Stacey engaged in variable levels of mouth cleans across sessions, ranging from moderate to high levels of quick acceptances ($M = 65\%$).

Jack engaged in 100% of quick acceptances across all sessions of the study, regardless of phase ($M = 100\%$).

**IMTB**

Figure 4 depicts the rate of IMTB across participants. During baseline, Phil engaged in moderate rates of IMTB ($M = 4.64$ IMTB per min). During the resource-light phase, Phil’s rate of IMTB increased to high rates across all sessions ($M = 65.09$ IMTB per min). During the final phase, Phil’s rate of IMTB decreased to variable rates across sessions, ranging from low to moderate rates of IMTB ($M = 2.78$ IMTB per min).

During baseline, Stacey engaged in variable rates of IMTB across sessions, ranging from zero to moderate rates ($M = 1.65$ IMTB per min). During the
resource-light phase, Stacey engaged in a slightly higher rate of IMTB ($M = 2.35$ IMTB per min). During the final phase, Stacey’s rate of IMTB decreased to baseline levels, ranging from zero to moderate rates of IMTB ($M = 1.79$ IMTB per min).

During baseline, Jack engaged in low rates of IMTB ($M = .28$ IMTB per min). During the resource-light phase, Jack engaged in no IMTB across sessions.

**Social Validity**

Social validity was measured using a questionnaire that was provided to the participants to complete anonymously. The participants strongly agreed that they were provided with enough information to implement the protocol and that the video models were needed to implement the protocol. The participants agreed or strongly agreed that the written instructions were enough to implement the protocol, that the protocol learned was something reasonable to implement in other settings, that the materials in the binder were sufficient to understand and implement the protocol with their child, and that they were implementing the protocol in the way it was instructed and modeled in the videos during phase 2. Finally, participants either agreed or strongly agreed that they would like their child to receive more intensive feeding services following the study.
Discussion

This study evaluated the use of resource-light materials to train caregivers to implement interventions for food selectivity. This is an important task; specifically, the demand for pediatric feeding clinics to address these concerns is higher than the supply of trained staff who can provide this service. This imbalance can cause long wait times and delays in much needed treatment of feeding problems. Identification of feeding problems that can be targeted using resource-light materials may enable children with less severe feeding problems to receive services more quickly.

All participants in this study achieved mastery criteria. One of the participants (Jack), reached mastery criteria using only the resource-light materials. For two of the participants, further training was required. All participants’ primary DV increased compared to baseline levels when tested following access to the resource-light materials, suggesting the resource-light materials were effective at changing caregiver behavior. Two of the children, Stacey and Jack, had an increase in quick acceptances during the resource-light phase and maintained these levels during the in-vivo prompts and feedback phase. Due to Phil’s score on the FSCAT, it is not surprising that he did not have an increase in quick acceptances. Overall, mouth cleans increased for Stacey and Jack, who accepted bites. In addition, IMTB maintained at low rates for these two participants. Phil had an increase in IMTB
during the resource-light phase. This was due to his caregiver presenting bites incorrectly following access to the binder materials. Once Phil’s caregiver moved to phase 3, the therapist provided feedback on her bite presentations which resulted in a decrease in Phil’s IMTB.

It is important to clarify that the IV in this study was the availability to the resource-light materials rather than the effect of the training materials. Due to the inability to measure the duration of time each caregiver dedicated to interacting with the material, no formal assessment of this was conducted. Thus, the IV was truly a measure of the “availability” (and not use) of the training materials.

This study is the first to address the training of feeding protocols using resource-light materials. The purpose of using resource-light materials is to investigate a way for behavior analysts to help families who are not able to receive immediate in-clinic care. By using resource-light materials, caregivers have the potential to learn non-intrusive feeding protocols that they can implement at home. This allows therapists in the clinic to dedicate their time to cases in need of more intensive services, while other families on the waitlist still receive some assistance.

This study is distinct from Muller et al. (2003), in that it evaluated resource-light materials (i.e., written instructions and video models) on caregiver training in which the onus of acquisition of the protocol falls on the caregiver. In contrast, Mueller et al. (2003) evaluated different methods of training caregivers to
implement pediatric feeding protocols and a component analysis of the treatment package. All groups in Mueller et al. (2003) consisted of some form of resource-heavy (e.g., therapist involvement) training (as defined in the current study) and all sessions in Mueller et al. (2003) occurred in the clinic. Additionally, video modeling was not evaluated. These differences set the current investigation apart from the previous literature.

In the current investigation, caregivers were given 72 hours of access to the resource-light materials prior to conducting phase 2 sessions. Once caregivers had conducted sessions in the second phase, they were instructed to no longer access the materials to avoid further acquisition while within the phase. This promoted consistency across all participants. In order to ensure that caregivers would not continue to review the materials, videos were removed from Youtube™ once the second phase began and caregivers were instructed not to review materials any further. Outside of the current investigation, caregivers would always have access to these materials once they had gained access to them. This would likely produce quicker acquisition of the protocol as caregivers could resort to the resource-light materials whenever needed. This highlights a key difference between the current investigation and typical learning in the real world.

This study is the first that has addressed the categorization of food selectivity. Prior to conducting the study, the first author of this study contacted
two top tier feeding clinics in the United States to inquire about their classification in determining if a child presents with severe food selectivity versus mild. The two clinics did not have operationally defined measures for separating severe versus mild food selectivity. Their definitions for what they would consider “severe” food selectivity differed drastically. This illustrates the importance of operationally defining different levels of food selectivity. The categorization of food selectivity is an important direction for pediatric feeding disorder research for several reasons. It allows behavior analysts to potentially prescribe specific interventions depending on the severity of the child being treated. In doing so, it may also help avoid interventions that are intrusive, yet unnecessary, for a child who may benefit more from simple environmental changes. The high drop-out rate within pediatric feeding disorders can sometimes be attributed to the utilization of intensive treatment (i.e., escape extinction). Escape extinction is often a go-to intervention for clinicians prescribing treatment for feeding issues due to its extensive success in the literature but is often too intensive for some families. This study began to develop a way to identify when and when not to use escape extinction, or other treatments, based directly on the severity of the child’s feeding issues.

For one of the three participants, Jack, the resource-light materials were sufficiently effective to achieve mastery criteria. Stacey’s caregiver’s mean during Phase 2 was 71.52 percentage of steps implemented correctly, but ultimately, she
did not reach mastery criteria in this phase. The results of the primary dependent variable (protocol steps implemented correctly), suggest that the use of resource-light materials can be enough to train caregivers to implement feeding protocols to high integrity, but the level of integrity may vary across participants. Access to the written instructions and video models for 3 days prior to implementing the intervention increased all participants’ behavior when compared to baseline levels. For Phil and Stacey, their percentage of steps implemented correctly increased to mastery criteria within the first three sessions of Phase 3. For these participants, in-vivo prompts and feedback were required. Phase 3 was designed to replicate the exposure to a trained therapist that caregivers would receive if admitted into an intensive day treatment feeding program. The therapist provided training techniques to train caregivers that are typical in a feeding clinic.

For quick acceptances, two of the three participants, Stacey and Jack, exhibited an increase. Phil did not engage in any quick acceptances during any phase of the study. The FSCAT categorized Phil as having severe food selectivity. Due to this categorization, it would not be appropriate to utilize the Structure Meals protocol in a feeding clinic to treat Phil’s feeding issues. The categorization that the FSCAT provides allows therapists to rule out specific treatments based on severity. Using the categorization, the therapist may want to start with a more intensive treatment (e.g., escape extinction) for a child presenting with severe food
selectivity. It is due to this categorization that Phil’s level of quick acceptances during this study is not surprising. Similarly, Stacey’s quick acceptances increased during phase 2 and remained above baseline in phase 3. Stacey’s FSCAT score placed her in the moderate food selectivity range, suggesting the Structured Meals protocol would be more appropriate. The protocol was effective at increasing bite acceptance. Jack engaged in high levels of quick acceptances across all phases, regardless of his severe food selectivity categorization. However, Jack was receiving advanced feeding treatment for developing chewing skills, which may have been why he had more success across sessions with quick acceptances.

For inappropriate mealtime behavior, Phil had a large increase in phase 2. This may also be explained due to the Structure Meals protocol not being the recommended treatment for a child with severe food selectivity. The IMTB was also high, due to his caregiver not presenting bites correctly, resulting in an increase in IMTB during phase 2.

The social validity questionnaire revealed that caregivers felt the resource-light materials utilized in the current investigation were enough to learn the Structured Meals protocol. Although caregivers agreed or strongly agreed that the written instructions alone were enough to learn the protocol, they all strongly agreed that the video models were needed. This suggests that a combination of written instructions and models are necessary for caregivers to learn a less intrusive
feeding protocol. Caregivers agreed or strongly agreed that the Structured Meals protocol was a reasonable feeding intervention to implement in other settings. This supports the idea that less intrusive feeding interventions may be more easily generalizable due to caregiver support. Finally, although two of the participants saw an increase in quick acceptances, all caregivers either agreed or strongly agreed that they would like their child to receive more intensive feeding services. This may have been due to the current investigation only targeting 4 novel foods in a clinic feeding room. We were unable to investigate if the bite acceptance would generalize to the child’s home or to other foods. This may have addressed the caregivers needs for further feeding treatment.

For the first participant, Phil, there was an effect for the primary dependent variable (i.e., percentage of steps implemented correctly) but no effects for the secondary dependent variables. This implies that Phil would need more intensive feeding services by trained feeding staff. The current investigation supports that caregivers can be trained to implement the Structured Meal protocol from resource-light materials regardless of the severity of the child’s food selectivity. However, for Phil, the results of the FSCAT suggest severe food selectivity. This would indicate that the feeding therapist should start feeding therapy with a more intensive feeding protocol. This would not be an intervention that caregivers should implement independently. Phil would be a child for whom placement on a waitlist
for admittance into an intensive day treatment program would be more beneficial that attempting caregiver training using resource-light materials in the future. The FSCAT would be a good tool for identifying how to best serve children. Children scoring in the severe range would be best served by waiting for intensive services, while children in the mild range may benefit from immediate, resource-light materials at home.

Limitations

One limitation is that Jack was included in the study using puree foods. According to his caregiver, he had food selectivity for both puree and table texture but was working on chewing table texture foods at another location. The current study used puree foods after initially attempting table texture foods, due to safety concerns with the table texture foods (i.e., early swallows, chocking).

A second limitation is that, due to the nature of the current investigation, caregivers were given access to the resource-light materials prior to implementing the treatment. This was conducted to replicate the type of training caregivers might receive while being on a wait list for a clinic. This type of training might help caregivers assist their child using less-intensive procedures. However, for the current study, we were unable to monitor how long each participant reviewed the materials or videos. It may be that some participants reviewed the materials several times and read the instructions daily, while some participants may have only
viewed and read the written instructions once. This was not addressed in the investigation.

**Future Research**

One direction for future research is to evaluate additional training methods that may increase the success of resource-light materials. Researchers may attempt to run a component analysis of the written instructions, video models, or other training methods to identify the types of interventions that are most successful at helping caregivers learn a feeding protocol without the direct training of a therapist. Future research should also examine the categorization of food selectivity. Researchers could evaluate the FSCAT to determine if it is capable of prescribing appropriate feeding treatments to all classifications of food selectivity (i.e., severe, moderate, and mild). If it can reliably identify a child’s food selectivity category and the prescribed intervention is successful, it may be an important tool in the future of prescribing feeding treatment to children.


*Behavioral Interventions, 22, 305-310.*


Piazza, C. C. (2008). Feeding disorders and behavior: what have we learned? 

*Developmental Disabilities Research Reviews, 14, 174-181.*


Percentage of Steps Implemented Correctly

Results

Figure 1. Percentage of steps implemented correctly across caregiver participants.
Quick Acceptance Results

Figure 2. Quick acceptances across participants.
Mouth Clean Results

Figure 3. Mouth cleans across participants.
Inappropriate Mealtime Behavior

Results

Figure 4. Inappropriate Mealtime Behaviors across participants.
Figure 5. Federal food group recommendations and current average intake, across ages. (Health.gov)
## Appendix A

### Structured Meal Protocol Data Sheet

### Protocol 1 Data Sheet

<table>
<thead>
<tr>
<th>Date</th>
<th>Session #</th>
<th>Data Collector</th>
<th>IDA/Prim</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Primary</td>
<td>IDA</td>
</tr>
</tbody>
</table>

**Pre-Session**

- **Gather Materials**
  - Timer: Food
  - Utensils: Tangible items

**Conducted Mini-Preference Assessment (Atleast 3 items)**

### In-Session (Caregiver)

<table>
<thead>
<tr>
<th>Presented Items</th>
<th>Bites</th>
<th>Bite 1</th>
<th>Bite 2</th>
<th>Bite 3</th>
<th>Bite 4</th>
<th>Bite 5</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

- **Provided brief rules:** e.g., "If you take your bite we can talk and play."
- **Provided specific prompt:** "take a bite," while presenting bite
- **Provided specific praise:** "Good job taking bite," if bite taken within 6s + item delivered
- **Removes toy at 6s + conducts MC**
- **Provided verbal prompt:** "You need to finish swallowing" if no MC + presents next bite
- **Provided specific praise:** "Good job swallowing," if mouth clean at 5s
- **No additional attention provided for IMTB or if bite not accepted within 6s**

### In-Session (Child)

<table>
<thead>
<tr>
<th>Bites</th>
<th>Bite 1</th>
<th>Bite 2</th>
<th>Bite 3</th>
<th>Bite 4</th>
<th>Bite 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acc</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
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</tr>
<tr>
<td>IMTB</td>
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</tbody>
</table>

**Accp = Bite deposited past plane of lips within 6s of presentation**  
**MC = No food (size of pea or larger) remaining in mouth**  
**IMTB = 45 Degree head turn, any contact of child with feeder’s feeding arm/hand, removing utensils 2 inches or more away from mouth**
## Appendix B

### Social Validity Questionnaire

**Social Validity**

*Training Caregivers to Implement a Structured Meal Protocol to Decrease Food Selectivity Among Young Children with Autism*

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Print **Name**:

1. I felt I was provided enough information to implement the protocol.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5

2. The written instruction was enough to implement the protocol.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5

3. The videos were needed to implement the protocol.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5

4. I would like my child to receive more intensive services for feeding issues.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5

5. I feel the protocol is something reasonable to implement in other settings.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5

6. The materials in the binder were sufficient to understand and implement the protocol with my child.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5

7. I felt I was implementing the protocol the way it was instructed and modeled in the videos.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neutral: 3
   - Agree: 4
   - Strongly Agree: 5
Appendix C
Structured Meal Protocol

Structured Meal Protocol

Session Duration: 5 bites or 10 minutes (whichever comes first)

Setting: Feeding session room

Reinforcer: Tangible item chosen from pre-session MSWO
Reinforcement Schedule: DRA FR30
  ▪ Deliver tangible item following quick acceptance (5s or less w/out inappropriate mealtime behavior) for 30s

Data Collection:
  ▪ **Mouth Clean**: No food larger than the size of a pea remains in the client’s mouth following 30s reinforcement interval
  ▪ **Quick Acceptance**: Food deposited past plane of lips within 5 s of bite presentation without inappropriate mealtime behavior
  ▪ **Inappropriate Mealtime Behavior**: 1) Any contact with feeders feeding arm from elbow down, feeding utensil, or bite of food 2) turning head 45 degrees or more from presentation of bite 3) Pushing the bolus 2 inches or greater away from mouth

Materials:
  ▪ **Supplies**: Food, feeding utensils, tangible items, bib, and timer
  ▪ **Bolus Size**:
  ▪ **Mastered Foods**:
    * **Protein**:
    * **Vegetable**:
    * **Fruit**:
    * **Starch**:
  ▪ **Feeder**: Caregiver
People Present in Room: Caregiver and child

Rule for Blocker: No blocker is used during this assessment.

Seating Arrangements: Child sits in a medium blue plastic chair (or high chair) at the table with feeder seated next to client.

Preliminary:

Review the Rules: "I’m going to give you a bite, if you take your bite I’ll say, “good job taking your bite.” If you swallow your bite I’ll say, “good job swallowing your bite.” If you take you bites fast, we can talk and play.”

Self-Feed (Portion-Based Meal)

1. Present a bite of food to the child’s lips and prompt, “take a bite”

   (+) If child accepts the bite within 5 seconds, provide brief verbal praise, “good job taking a bite.”
   Provide child tangible item and begin 30 s mouth check timer.

   (-) If child does not take bite within 5 s or engages in inappropriate mealtime behavior, immediately keep bite where it was first presented for 30s. Do not provide attention to child.

2. Once the 30s mouth check timer elapses, take away tangible item and prompt child to “show me ahh.”

   (+) If child shows you ahh and there is no food larger than the size of a pea remaining in the mouth, provide brief verbal praise, “good job swallowing!” Present the next bite.

   (-) If the child still has food larger than the size of a pea (that is masticated) remaining in the mouth during mouth clean check, prompt child to “finish swallowing” and present next bite.

3. If the child ever has 3 full bites in their mouth at the same time, discontinue prompting to take a new bite. Instead, continue mouth checks prompts every 30s until food in mouth is swallowed. Then continue to next bite.

Once all bites are accepted and swallowed end session.
Appendix D
Structured Meal Main Components Sheet

Participant Name:  
Begin Date:  
Primary Researcher: Ronald J. Clark  
Date Revised: 4/16/18

Structured Meal Protocol  
Main Components

Before Session:

1) Preference Assessment

- Place 3 toys on table in front of child without letting them touch toys. Then remove hand and prompt, “pick one!”. The first toy they touch is used in session. Remove toys, placing the two not picked out of sight (e.g., under table, behind you).
2) Give Specific Rules

- Before presenting any bites, provide specific rules;
  - "I’m going to give you a bite, if you take your bite I’ll say, “good job taking your bite.” If you swallow your bite I’ll say, “good job swallowing your bite.” If you take you bites fast, we can talk and play."

During Session:

1) Presenting A Bite

Present bite of food by physically touching child’s lips and prompting, “take a bite.”
- Must prompt when you physically touch lips, not before, should happen simultaneously!
- Start 30s timer

Takes bite within 5s with no IMTB – “Good job taking your bite!”
- Provide toy + attention
- Restart 30s timer for mouth clean interval

Takes bite following 5s – Provide no attention
- Provide no toy or attention, even if bite is taken at second 6 or 29
- Restart 30s timer for mouth clean interval

Does not take bite (Passively refuses or engages in IMTB) – Provide no attention
- Provide no toy or attention
- Keep bite where you first touched lips for initial 30s
- Ignore IMTB

2) Conducting Mouth Clean Check

Once 30s Mouth Clean interval elapses, remove toy and prompt child to show you their mouth by saying, “show me ahhhh”
• Allow 5 seconds to show you, if child refuses to open mouth, move to next bite, provide no additional attention

No food larger than the size of a pea remaining in mouth – “Good job swallowing!”

• If child refused to show last mouth clean, you may add additional praise, “Good job showing me and good job swallowing!”
• Use baby spoon to look inside mouth if needed

Food larger than the size of a pea remaining in mouth – “Need to finish swallowing”

• Immediately present next bite
• Provide no additional attention
• Use baby spoon to look inside mouth if needed
• If three full bites in mouth, do not move to next bite. Instead, restart 30s intervals and conduct mouth clean checks, prompting as required, until food is gone, then move to next bite.

3) Bite Rotation

Each session consists of 5 bites, rotating through all four food groups within the session and across session. This way you start with a different food each session. (Example below)
Appendix E
Cheat Sheet

Cheat Sheet

Takes bite 5s or less
- “Good job taking your bite!”
  + Give toy

“Take a Bite”
Greater than 5s
- No praise – No attention

Take away toy +
Food less than pea in mouth
- “Good job swallowing!”

“Show me ahhhh”
Greater than pea remaining
- No praise – No attention

When to give attention:
- Quick Acceptance = 5s or less + No Problem Behavior
- Talk and play during reinforcement interval

When not to give attention
- Longer than 5 seconds
- Don’t provide attention for inappropriate mealtime behavior;
  - e.g., hitting your hand
- hitting the spoon
- pushing the food
- turning away
- yelling
- crying
- question asking

- Don't provide additional prompts
  - Only one prompt each

Keep all **prompts and praise specific** (e.g., “good job swallowing” not, “good job”)