A balanced diet is fundamental in growth and development. The toddler and preschool years represent a time of cognitive, emotional, and social development. Many children’s dietary intake does not meet the recommendations established by the U.S Department of Health and Human Services and the U.S. Department of Agriculture. Specifically, there is a concern regarding fruit and vegetable intake. Picky/selective eating patterns are common among children, but have been shown to be more prevalent and ongoing in children with developmental delays. Family meal style service has been shown to promote a balanced diet, and thus a useful tool for combating picky/selective eating. Family Meal Style eating makes meal time a learning experience and is aimed to help children develop positive attitudes towards nutritious foods, learn to engage in social eating situations, and develop healthy eating patterns. Children learn through observation at a young age, and therefore caregivers and peers serve as important role models for establishing eating patterns and behaviors. In the play group setting, individuals have the opportunity to model peers, play group organizers, and parents/caregivers. Unfortunately, local play groups are limited and typically not aimed towards children with developmental delays, and those that are available charge a substantial out-of-pocket fee.
The objective of the study was to determine the impact of Family Style Meal Service and modeling techniques during snack time on dietary intake and problematic eating behaviors among children with developmental delays participating in an interdisciplinary play group. A pre-test, post-test research design was used for the Interdisciplinary Developmental Play Group intervention. The commitment for participation was a total was 10 weeks; week 1 involved screening followed by 8 weeks of intervention, and a follow up assessment on week 10. In total, 12 children completed the program.

The aim was to increase the children’s consumption of fruit, vegetables, dairy, and protein and decrease the children’s consumption of sugar sweetened foods and beverages and salty snacks. After analysis, it was determined that the average intake of fruit, vegetables, dairy, protein, sugar sweetened foods and beverages, and salty snack all decreased over the intervention. Following a Wilcoxon Signed Ranks Test, it can be stated that these results lack significance (α<0.05). However, eating and meal time behaviors were found to have significantly (α<0.05) decreased following the intervention. In conclusion, Family Style Meal Service and modeling techniques are positively related to eating and meal time behaviors in young children participating in play group therapy. However, the 8-week intervention did not prove to have a significant positive impact on dietary intake. The findings suggest that the social setting of the play group and Family Style Meal Service may be important in establishing healthy habits, but are not conclusive.
THE EFFECT OF FAMILY MEAL STYLE SERVICE AND MODELING TECHNIQUES ON DIETARY CONSUMPTION AND EATING BEHAVIORS FOR TODDLERS IN A DEVELOPMENTAL PLAY GROUP

BY

EMILY V. MITCHELL

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A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE MASTER OF SCIENCE

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Thesis Director:
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CHAPTER 1

INTRODUCTION

Background

A balanced diet and adequate nutrition are essential for a child’s proper growth and development. The toddler and preschool years represent a time of cognitive, emotional, and social development, and are specifically characterized by changes in the brain function and structure. Proper development requires not only sufficient amount of protein, carbohydrate, and fat, but also a variety of vitamins and minerals. Through the age of two years old, the brain undergoes rapid growth, and the development of the frontal lobes continues through early childhood. Zinc, iron, iodine, folate, selenium, and long chain poly unsaturated fatty acids have been shown to contribute to optimal brain development due to their integral role in the production of enzymes and cofactors required for brain growth. Therefore, it is important that young children maintain a dietary intake which includes all food groups; fruits, vegetables, grains, protein, and dairy. In addition, appropriate nutrition helps promote a strong immune system. Undernourished children may struggle to fight infections, and therefore end up missing school and failing to meet academic standards. Furthermore, as children are growing, proper nutrition is essential in maintaining activity levels. Finally, this time period represents a transition from direct maternal control to indirect maternal control of food intake, thus toddlers experience an increase in autonomy regarding what they eat.
The Dietary Guidelines for Americans, developed for healthy individuals 2 years and older, encourages an increased consumption of low-fat dairy products, vegetables, fruits, and whole grains and reduced consumption of fruit juice, sugar-sweetened beverages, and foods high in sodium. Children have high nutrient needs, but relatively low energy requirements, and therefore consumption of a variety of fruits and vegetables, whole grains, and dairy products, and limiting energy dense foods and beverages is recommended. The American Academy of Pediatrics and the American Dietetic Association endorse The Dietary Guidelines for Americans.³ Data from The 2008-2009 Feeding Infants and Toddlers (FITS) show that some of the consumption patterns observed among young preschoolers are consistent with these recommendations, but there is concern regarding fruit and vegetable intake among infants and young children living in the United States and there is substantial room for improvement. Approximately 30% of 2- and 3- year olds included in the study did not consume a distinct portion of vegetables daily. Further, less than 15% of the 2- and 3- year olds consumed dark green and yellow vegetables. White potatoes were by far, the most consumed vegetable, and more than 50% of children who consumed white potatoes consumed it in fried form. They found that approximately 73% of children consumed a portion of whole fruit daily. Additionally, 85% of 2- to 3- year olds consumed some type of sweetened beverage, dessert, sweet, or salty snack each day.⁴ When compared to FITS 2002 data, there has been no significant change in young children’s dietary intake.⁵ Moreover, studies conducted by The Centers for Disease Control between the years of 2007 and 2010 indicate that 9 in 10 children do not consume enough vegetables and 6 in 10 children did not consume enough fruit.⁶ It is evident that research and intervention are needed to intervene and improve young children’s dietary intake. A parent’s
intake of fruits and vegetables significantly influences the child’s intake. Eating patterns developed during this period of growth, typically transcend into adulthood and therefore, there is a continual need for nutrition intervention within this age group.

Picky eating and/or specific food preference and a parent’s perception of their child’s pickiness, contribute to inadequate dietary intake and are common among most toddlers. However, selective eating is more prevalent and ongoing in children with autism and developmental delays and may be, in part, due to impairments in sensory processing. Children with autism and developmental disabilities of mixed etiology tend to exhibit a higher sensory score for taste and smell than children with typical development. These sensitivities may include: avoiding certain tastes or food smells that are typically part of a child’s diet, only eating certain tastes, and limiting food variety to specific textures and temperatures. Abnormal sensory reactivity has a significant negative relationship to fulfilling a balanced diet and may include coexistent aversions to specific colors, smells, temperatures, textures, and preferences for energy dense foods. Typically, children that exhibit sensory sensitivity, consume diets limited in variety, high in energy dense foods, and low in fruits, vegetables, and fiber. Parents of children with Autism Spectrum Disorder frequently report refusal of foods based on characteristics. Another study sought to determine if this refusal was greater in children with Autism Spectrum Disorder than children with typical development and further, if it was associated with a greater percentage of foods refused. They found that consistency/texture was the most frequent reason for food refusal among all children, but the prevalence was much higher in children with Autism Spectrum Disorder. When compared with children with typical development, dietary patterns in children with Autism differ. Specifically, it is suggested that children with Autism Spectrum
Disorder consume greater amounts of energy dense foods, including significantly more juice and sweetened non-dairy beverages, energy-dense snacks, and fewer vegetables. However, the results did not show a significant difference in fruit intake between children with Autism Spectrum Disorder and children with typical development.\textsuperscript{11}

The environment in which meals are served can impact a toddler’s willingness to try new foods and develop healthy dietary patterns. Family style meal service has been shown to be an effective in creating an environmental conducive to establishing healthy behaviors in the home, as well as in schools and daycare facilities. Family style meal service approaches mealtime as a learning experience and the objectives include, helping children develop positive attitudes towards nutritious foods, learning to engage in social eating situations, and developing healthy eating patterns. Child involvement is integral to the concept of family style meal service, and can be done by allowing children to help prepare the meal, set the table places, engage in conversation during the meal, and/or assist in clean up following the meal. Supervisors may assist those who struggle to serve themselves, encourage children to make their own food choices, and actively participate in the process.\textsuperscript{12} When establishing family meals, it is important that children are provided guidance through physical assistance and engaging in appropriate social exchanges, such as taking turns, as well as given age appropriate serving utensils and dishware to establish age appropriate portions. The use of child size utensils helps the child understand expectations of serving sizes and behaviors.\textsuperscript{13} Family style meal service is the standard for all Head Start Programs. When family style meal service, family style meal service where fruits and vegetables were served first, and meal service with pre-portioned plates were
compared, it was determined that fruit and vegetable intakes were significantly lower and energy intake significantly higher in the provider portioned versus both the family style conditions. The results provide support for the current recommendations for family style meal service in the preschool setting.\textsuperscript{14}

Current research has shown a positive association between the frequency of family meals and food patterns and practices\textsuperscript{15}, as well as psychosocial well-being.\textsuperscript{16,17} Based on a self-administered survey, it was determined that as the frequency of family dinners increased, the intake of important nutrients such as fiber, calcium, folate, iron, vitamins B6, B12, C, and E increased. Additionally, the investigators found that meals contained a lower glycemic load, as well as a lower percentage of total daily energy from saturated fat and trans fat.\textsuperscript{15} Additionally, another research team found that individuals who reported to never have family dinners, were significantly more likely to become overweight and food insecure than those who had dinner 5-7 times per week.\textsuperscript{16} Further, the association between family meal frequency and adolescents with problem behaviors after adjusting for family connectedness, parental awareness, other family activities, and any other potentially confounding variables has been examined. Their results indicate that family meal frequency is negatively associated with substance abuse and running away for females, and drinking, physical violence, property destruction, stealing, and running away for males.\textsuperscript{17}

Parents have reported several benefits to family style meals including, opportunities for modeling healthy behaviors, enhanced family connectedness, and encouraging nutritious meals, but also state that barriers exist. Barriers may include, child behavior problems, scheduling difficulties, lack of self-efficacy in meal preparation and ill-prepared husbands.\textsuperscript{18} Head Start and
Child and Adult Food Care Programs that do not use family style meal techniques expressed that it was resource intensive and messy, however others reported being motivated by the pleasant mealtime family style meals created, the promotion of healthy child development, and the opportunities presented to model healthy eating practices.\textsuperscript{19}

Group Play Therapy has been shown to improve children’s cognitive development including, problem solving, communication and social skills, along with application of knowledge.\textsuperscript{20} Other studies have shown that Group Play Therapy is effective in social development and promoting self-confidence, while also decreasing symptoms of anxiety and depression.\textsuperscript{21,22} Group Play Therapy is often described using the Social Learning Theory, a learning theory based on modeling, which is explained as observational learning followed by guided performance.\textsuperscript{23} The play group setting provides an excellent opportunity for modeling based on the consistency in the environment, including location and the children and adults present each week. This predictable social context and comradery makes modeling of healthy eating behaviors feasible because the children gain a sense of security and trust within the play group resulting in an environment conducive to behavior change. Research has shown that in social contexts, people model the food intake of their companions. Therefore, individuals may take the behaviors of others as an example of appropriate eating, and adjust their own food intake accordingly.\textsuperscript{24} In the play group setting, participants have the opportunity to model peers, supervisors, and caregivers and will likely make adjustments in their intake based on others modeling healthy eating behaviors. Thus the practice of modeling techniques in the play group setting is a plausible tactic for targeting picky eating in children. Unfortunately, local play groups are limited, typically not aimed towards children with specific developmental delays, and those
that are available charge a substantial out-of-pocket fee.

Objectives

1. Assess the impact of family style meal service and modeling techniques during snack time on dietary intake among children with developmental delays participating in an interdisciplinary developmental play group.

2. Assess the impact of family style meal service and modeling techniques during snack time on problematic eating behaviors among children with developmental delays participating in an interdisciplinary developmental play group.

Research Questions and Hypotheses

Research questions included the following:

1. Does the incorporation of a family style snack routine and use of modeling techniques positively affect a child’s willingness to consume nutrient dense foods, and therefore increase the frequency of consumption?

2. Does the incorporation of a family style snack routine and use of modeling techniques positively affect a child’s willingness to consume nutrient dense foods, and therefore decrease consumption of energy dense foods?

3. Does the incorporation of a family style snack routine and use of modeling techniques positively affect a child’s eating and meal time behaviors?
Research hypotheses included the following:

1. A family style snack routine and modeling techniques will positively influence the intake of nutrient dense foods, as measured by General Child Harvard Study Food Frequency Questionnaire, among children with developmental delays participating in an interdisciplinary play group.

2. A family style snack routine and modeling techniques will decrease the intake of energy dense foods, as measured by General Child Harvard Study Food Frequency Questionnaire, among children with developmental delays participating in an interdisciplinary play group.

3. A family style snack routine and modeling techniques during snack time will reduce problematic eating behaviors, as measured by Children’s Eating Behavior Inventory, among children with developmental delays participating in an interdisciplinary play group.

Justification

Picky and/or selective eating is common among children with developmental delays, and can be frustrating and stressful for parents. It can be challenging to ensure a child consumes a balanced diet, however proper nutrition is integral in helping children reach cognitive, emotional, and social developmental milestones. There are several strategies to combat picky eating, but parental and peer modeling, as well as, child involvement in meal preparation, and family style meal service are three effective techniques.
Statement of Research Problem

The purpose of this investigation is to determine the impact of a positive reinforcement playgroup intervention on nutrient dense food intake, energy dense food intake, as well as problematic eating and meal time behaviors. Positive reinforcement throughout snack time includes parental, peer, and investigator modeling of healthful mealtime behaviors and intake. Additionally, snack time will require involvement of the children during snack time and will be served family style to promote self-selection of various food options.
The American Academy of Pediatrics recommends that children 1-3 years old consume 2-3 servings of fruit, 2-3 servings of vegetables, 6-11 servings of grains, 2 servings of meat or other proteins, and 2-3 servings of dairy. A portion size of fruit for a child 1-3 years old is ¼ cup cooked, frozen, or canned, ½ piece fresh, or ¼ cup 100% fruit juice. A portion size of vegetables is ¼ to 1/3 cup cooked (canned or chopped) or ½ cup salad. A portion of grains is ¼ to ½ slice bread, ¼ to ½ bun, bagel, or muffin, ¼ cup cooked cereal, rice, or pasta, 1/3 cup dry cereal, or 2-3 crackers. A portion of meat/other protein is 1-ounce meat, fish, chicken, or tofu, ¼ cup cooked beans, or ½ egg. A portion of dairy is ½ cup milk or yogurt or ½ ounce of cheese. Although these recommendations should be considered when determining the adequacy of a toddler’s diet, the child’s stage of growth and development, appetite, and activity also influence the adequate portion size for a particular child.25

Current Toddler Nutrition Interventions

The “Healthy Toddlers Trial Protocol” is a randomized, experimental, short-term, longitudinal study including a control and intervention group, involving both toddlers and their mothers. The goal of this intervention is to promote healthy eating behaviors in children 1 to 3
years old; a time period when important dietary patterns are established. This intervention includes eight in-home lessons and four reinforcement telephone contacts. The lessons focus on fruit, vegetables, and sweetened beverages, as well as parental behaviors. The results from this study are currently unavailable, however results will be based on in-home data collection (anthropometric measurements, feeding observations, questionnaires, and 3-day dietary records) taken at baseline, immediately following the intervention, and 6 months following the intervention. It is hypothesized that toddlers will experience an increase in fruit and vegetable consumption, with a corresponding decrease in sweetened beverage consumption. Additionally, the investigators hope to see improvement in the toddler’s ability to self-feed and self-serve. The main parent outcomes include: improved knowledge, attitude, and self-efficacy related to feeding their child, as well as implementing a positive environment for eating (family meals). If the results are as hypothesized, it will be evident that this is an effective way to improve the overall health and development of children.

Nutrition Education Aimed at Toddlers (NEAT) is a curriculum, including 4 lessons and 18 reinforcing activities, intended for rural, low income parents and their toddlers. The goal is to help parents gain the knowledge and skills required to help their toddler establish healthy eating behaviors. The curriculum involves the parent(s) and their toddler with activities relating to strategies for introducing new foods to toddlers, dealing with “picky eaters,” developing parenting skills related to feeding toddlers, and involving toddlers in food preparation. Throughout the intervention, care was provided for toddlers while the parents participated in presentations and discussions. Following the presentations, parents applied their skills by involving the toddlers in food preparation and a tasting activity. Following an evaluation of 24-
hour diet recalls, self-reported behavior surveys, and observation, the results indicate that the
parents following the NEAT curriculum significantly increased their knowledge, allowed their
child more independence when eating, and decreased the amount of television time for their
children in comparison to the control group who did not receive the NEAT curriculum.28

Barriers to Implementing Healthy Behaviors for Children

Caregivers are an important influence on their young child’s eating habits. Unfortunately,
several barriers to healthy eating practices exist in families. Mothers living in low-income, rural
areas expressed barriers including: work schedules, high cost of food, and/or inadequate time to
shop, plan, and prepare nutritious meals. It is important that these concerns are addressed when
implementing nutrition interventions.26

Early Intervention

Early Intervention, a state-wide program funded by the Department of Human Services,
provides services to children 0-3 years old who meet inclusion criteria including: the presence of
a disability or delay in an area of development, a condition that is known to cause disability or
delay, or is at high risk for a developmental disability.29

The Five Domains of Development

Developmental delays are categorized into five domains, and include delays in cognitive,
physical, communication, social emotional, and/or adaptive development. When a child is assessed
for inclusion in Early Intervention they are guided through activities which address these areas of
The cognitive domain involves thinking, learning, and problem-solving. The physical domain comprises vision, hearing, gross motor, fine motor, and response to stimuli. The communication domain includes the ability to express oneself through language and understand what others are saying. The social emotional domain involves playing, a sense of security, and interpersonal relationships. The adaptive domain includes self-care skills, such as feeding, brushing teeth, and washing hands.\textsuperscript{30}

**Early Intervention Services**

The services are designed to help the child grow in any of the following areas of development: physical, cognitive, communication, social-emotional, and/or adaptation. Early Intervention may be implemented by a variety of specialists, and the service provider is determined based on the child’s specific needs. Families are fundamental in a child’s growth and development, therefore Early Intervention services are done in a natural setting (home, grocery store, library, park, play groups). The parent learns how to work and play with their child in a practical, natural setting. Early Intervention services are provided solely on an individual basis.\textsuperscript{29}

**Group Play Therapy**

Group Play Therapy\textsuperscript{20,31} is a method of therapy that utilizes play, along with the natural benefit of interpersonal exchanges among children and adults, to establish positive relationships and obtain personal growth. Group Play Therapy is defined by Sweeney and Homeyer, 1999 as:

...dynamic and interpersonal relationship between a child and therapist trained in both play therapy and group procedures, who provides selected play materials and facilitates the development of a safe relationship for children to fully express and explore themselves and others (including feelings, thoughts, experiences, and behaviors) through the children’s
natural medium of communication, play.

The concept of Group Play Therapy can be adapted to the needs of different populations, but includes several important elements. The following are important components of a group play therapy session: acceptance of each child; an invitation to play without explanations, goals, reasons, questions, or expectations; guidance in learning to express oneself and enjoy respect; permitting, but not encouraging regressive behavior; permitting “symbolic behavior” with limits on destructive behavior; prohibiting physical violence, enforcing limits calmly, non-critically, and briefly mentioning limits only as necessary; feeling and expressing empathy.\(^{32}\)

**Rationale for Group Play Therapy**

In their book “Handbook of Group Play Therapy”, Sweeney and Homeyer (1999) explain basic advantages of play therapy. First, children tend to engage in more instinctive behaviors in group settings, therefore fully engaging in the play group experience. Additionally, Group Play Therapy addresses a child’s intra- and interpersonal concerns. The child is free to express and explore, ultimately facilitating self-growth and exploration from group member’s feedback. Interpersonal exchanges (child-therapist and child-child) allow children to observe other group members coping behaviors, problem-solving skills, and methods of self-expression. A child may explore an activity they were originally uncomfortable with after observing another group member’s involvement. Furthermore, groups help children set boundaries required outside of the playgroup. Children learn that although most expressions are acceptable, limits must be set. The playgroup setting allows children to “practice” daily life interactions, while they are learning interpersonal skills, new behaviors, offering and receiving assistance, and experimenting with
alternative ways to express emotions in a safe setting.  

Positive Impact of Group Play Therapy

Group Play Therapy has been shown to enhance self-awareness, self-regulation, social communication, empathy, and adaptability in children. Research exhibits the positive effect Play Group Therapy has on Social-Emotional skills in children. Specifically, an experimental, case-control study examined the development of preschoolers involved in a play group. Their results indicated that the play group therapy increased cognitive development in children as determined by a positive impact on the children’s BUSSE-SR scores. Furthermore, child-oriented play may be an effective way for promoting toddlers’ positive development by increasing their cooperation with adults, as well as their socio-economical competence.

Parents have expressed increased self-efficacy, as well a stronger sense of social support as a personal gain from play group therapy. NEAT, a toddler nutrition curriculum, showed the importance of involving parents in nutrition education and food preparation. With an increase in the parent’s knowledge base, an increase in parental self-efficacy regarding feeding their child was noted. The increase in self-efficacy translates into better, age-appropriate care. Parents have also expressed an increase in the understanding of their child’s socialization and learning, further increasing their self efficacy regarding raising their child. Additionally, social support has been recognized as an important resource for parents of young children. Involvement in playgroups leads to the development of friendship networks, from which parents can draw social support from. The longer the parent and child remain in the playgroup the larger the impact social support has on their parenting.

Although play group therapy focuses on proper development of children, it does not
typically emphasize nutrition and snack time. However, Holmes analyzed snack time at a once-weekly Psychoanalytic Parent-Toddler Group. This longitudinal study looked at food intake, and the possible links to childhood and adolescent eating disorders. Snack time was implemented as a group activity, held at the same time weekly. Toddlers and parents were encouraged to sit around the table and toddlers were given plates in which they could serve themselves any of the food available. The results brought up three main themes, snack time is an affective experience, children strive to express autonomy during snack time, and snack time can serve as an important time for observation and learning for toddlers.$^{36}$

There have been many positive indications of play group therapy on child development, however the inclusion of nutrition as a key player in child development has been discounted as an important contributor to child development and growth. The play group setting provides a great opportunity to establish healthy eating behaviors in toddlers through the inclusion of family style meal and modeling techniques.

**Current Use of Developmental Play Groups**

Local play groups are limited and typically not aimed towards children with developmental delays. Currently, play groups are not funded and therefore, despite research backing up their positive impact, they are rarely implemented nation-wide. Play groups which are available charge a substantial out-of-pocket fee. However, The University of California, San Francisco Beincoff Children’s Hospital created and implemented a Developmental Playgroup Program as part of their Early Intervention Services. The program is a community based playgroup intervention, in which the healthy development of infants and young children at risk for
developmental delays is encouraged through developmentally appropriate play activities with parental support and education.\textsuperscript{37} Lekotek, a division of the Anixter Center in Chicago, also provides play group services for children, 0-8 years old, with disabilities. The play group is facilitated once monthly by Family Play Specialist(s) and volunteers, and includes children with special needs, as well as the child’s parent(s) and sibling(s). Play groups are broken down by age to provide a safe space for children to interact with peers and learn social expectations, as well as ensure developmentally appropriate activities.\textsuperscript{38} These programs are not only promoted for their ability to assist children in reaching developmental milestones, but also for providing hands-on education to caregivers on how to play with their child and creating a support system by establishing relationships among caregivers with children with special needs.

Food Acceptance & Intake

A child’s acceptance of a balanced diet filled with variety is effected by various factors. Two contributing factors are the parent’s and sibling’s eating habits because children learn from observation and model the behaviors they see in individuals they admire.\textsuperscript{42,43,44,7} Parents also have the responsibility of purchasing and preparing meals, and therefore are largely accountable for the food the child eats.\textsuperscript{28,39} Additionally, many young children exhibit picky/ selective eating behaviors. It is common for young children to experience “food jags”, in which the child limits their food acceptance to very few food items, however children with Autism Spectrum Disorder and other developmental delays tend to exhibit these behaviors to a greater extent.\textsuperscript{47,48,8,9,49}
Parental Influence on Child Eating Habits

A strong relationship exists between the child and parent in terms of feeding and dietary intake. The child is responsible for how much and whether or not they would like to eat, while the parent is responsible for deciding what food is purchased and served, as well as when food is served. Specifically, a child’s affinity for and consumption of foods high in energy, sugar, and fat may be heightened by environments where those foods are present and consumed by family members. Other than the options the child has based on what is served, there are several other factors that play into the child’s eating habits that relate to the role of the parent.\textsuperscript{28,39} One important concept is modeling, a concept originated by Albert Bandura.\textsuperscript{23}

The Social Learning Theory and Modeling

Social Learning Theory is a learning theory based on modeling, observational learning followed by guided performance, developed and explained by Albert Bandura.\textsuperscript{23} Children learn through observation beginning at a young age; consequently caregivers and peers serve as important role models for establishing eating patterns and behaviors. Bandura believed that individuals learn not only from external cues, as in behavioral theory, but also from observing models.\textsuperscript{40} There are four important aspects of parental modeling. Observational learning begins when the observer originally learns the behavior from the model, which is then followed by the observer recognizing any emotions associated with the behavior based off of the models actions. Then, the models behavior effects the timing or frequency of the action, so the observer learns when and how often the behavior should occur, which leads the observer to initiate and practice the behaviors.\textsuperscript{41}
Literature seeks to apply Albert Bandura’s Social Learning Theory to eating patterns and behaviors. Positive modeling of food intake serves as an effective practice in promoting food acceptance. In 1980 Birch conducted an important study which presented an early perspective on the concept of modeling. In this study, peer modeling was used to modify children’s vegetable preference. Over four consecutive days, children ate lunch next to peers who preferred a different vegetable to themselves (peas versus carrots). Following the four lunch periods, children showed a change in their vegetable preference. A follow up assessment several weeks following the study, indicated that this change in preference endured. Further, an experimental study showed the importance of positive emotional modeling regarding food intake. This study measured 12-month children’s willingness to eat a specific food immediately following an introduction of the food with a particular emotion. Researchers found that when given choices for food intake, young children reached for foods that had previously been positively endorsed by a friendly adult in their native language. These results indicate the importance of modeling positive emotions during meal or snack time. An additional study assessed the impact of social influences on overcoming food “neophobia” in children 2 to 5 years old. The child’s food acceptance was assessed in three different conditions. The conditions included the child’s food acceptance when the model was not eating, when the model was consuming a food of a different color, and when the model was eating a food of the same color. They found that children were more likely to accept novel food when the model was consuming the same colored food. These results strengthen the concept that food acceptance in young children is promoted by modeling intake of the unfamiliar food.
Dietary habits aggregate in families; making parents an important role model for establishing healthy eating behaviors. The frequency with which parents model healthy dietary behaviors is dependent on the parent’s current dietary habits. When looking at various healthful eating practices, it was determined that parents are selective in the behaviors they choose to model. Many chose the behavior of sitting with their children at mealtime and modeling eating foods they want their child to eat. However, it was infrequently reported that parents model the intake of low fat snacks and establishing a goal for daily fruits and vegetables consumption. Furthermore, using a food frequency questionnaire and food knowledge questionnaire, an association between toddler’s intake maternal intake was identified. The results showed a significant relationship relating the mother’s intake to the child’s vegetable, fruit, and snack food intake. Additionally, a study intended to validate the “Parental Modeling of Eating Behaviors Scale” observed maternal modeling to be significantly related to their child’s food responsiveness, enjoyment of food, and food fussiness.

Picky Eaters

During early childhood, children begin to develop food preferences. Some parents become concerned because their toddler’s likes and dislikes are unpredictable and they perceive their toddler as a “picky eater.” Picky eating is common in this age group; however the American Academy of Pediatrics encourages parents to continue to present their toddler with healthy choices in order to decrease the picky eating over time. Research shows a relationship between a parent’s judgment on their child’s eating behaviors and the child’s intake of a balanced diet. A cross-sectional study examined the influence of a mother’s perception of her toddler being a
“picky eater,” as well as the mother’s fruit and vegetable intake, on the toddler’s intake of fruit and vegetables. The mothers completed a Feeding Self-Efficacy Scale, Toddler-Parent Mealtime Behavior Inventory, as well as a food frequency questionnaire regarding her eating habits as well as her toddler’s eating habits. The study results indicate that toddlers are less likely to consume vegetables 4 or more times per week if their mothers viewed them as picky eaters or if the mother did not consume vegetables 4 or more times per week themselves.47

**Picky/Selective Eating in Children with Developmental Delays**

Picky eating and/or specific food preference contribute to inadequate dietary intake and is common among most toddlers, however it is more prevalent and ongoing in children with Autism Spectrum Disorder and developmental delays of mixed etiology. This is thought to be due to impairments in sensory processing. One study compared children with autism, children with Fragile X Syndrome, children with developmental disabilities of mixed etiology, and children with typical development. They determined that children with Autism, Fragile X Syndrome, as well as developmental disabilities of mixed etiology exhibited a higher sensory score for taste and smell than children with typical development. Children with Autism scored the highest on the sensory scale.8 A later study further solidified these findings by comparing sensory processing in children with Autism and children with typical development. The research indicates that individuals with Autism experience taste and smell sensitivities that interfere with proper nutrition. These sensitivities may include; avoiding certain tastes or food smells that are typically part of a child’s diet, only eating certain tastes, and limiting food variety to specific textures and temperatures.9 Abnormal sensory reactivity has a significant negative relationship to
fulfilling a balanced diet. Problems related to eating and meal time behaviors have been shown to be significantly greater in children with Autism Spectrum Disorder than their siblings with typical development, even when adjusted for age and sex. The most common caregiver-expressed concerns include lack of variety, unwillingness to try new foods, and an inability to tolerate new foods on their plate. These concerns describe selective/picky eating, and many caregivers report that these behaviors become increasingly problematic around the age of 3.48

Another study sought to compare nutrient and food group intake, as well as overall dietary quality among children with autism, children with developmental delays of mixed etiologies, and children with typical development. Based on 3-day food records and interview information, children with autism and children with developmental delays of mixed etiologies did not differ in their dietary consumption. All groups consumed inadequate fiber, vitamin D, and vegetables. However, differences in average intakes of calcium and dairy were seen among children with Autism and children with typical development. Further, inadequate intake of folate, grains, and dairy was seen to be greatest in children with Autism following an intentional restrictive diet due to the popularity of the casein, gluten free diet among children with Autism.49 These results emphasize the importance of evaluating the diets of children with autism and developmental delays on an individual basis to determine any deficiencies due to unique dietary patterns and aversions.

Family Style Meal Service

Family Style Meal Service allows participants to eat together and make food choices based on individual appetites and food preferences. Importantly, mealtime serves as a learning experience and is aimed to help children develop positive attitudes towards nutritious foods,
learn to engage in social eating situations, and develop healthy eating patterns. Involvement from children is fundamental in the concept of Family Style Meal Service, and can be done by allowing children to help prepare the meal, set the table places, engage in conversation during the meal, and/or assist in clean up following the meal. Another important aspect of Family Style Meal Service is the flexibility in serving size; the child can try as much or as little of each food as they choose. To properly facilitate Family Style Meal Service several guidelines should be followed: all meal components should be placed on the table at the same time and children may serve themselves from serving dishes placed on the table. Supervisors assist those who struggle to serve themselves, encourage children to make their own food choices, and actively participate in the process to encourage healthy eating habits. It is important that the supervisor offers food items again if initially refused and models healthy eating habits at the table.\textsuperscript{12}

The implementation of Family Style Meal Service in all Head Start Programs triggered an experimental trial evaluating the effectiveness of the traditional Family Style Meal approach currently used. They compared the traditional Family Style Meal Service currently being used in Head Start daycares with Family Style Meal approach in which fruits and vegetables were served first and meal service with pre-portioned plates. They found that serving fruits prior to the rest of the meal was effective in increasing fruit intake, however vegetable intake was not increased when vegetables were served before the rest of the meal. Fruit and vegetable intakes were significantly lower and energy intake significantly higher in the provider portioned versus the family style condition. The results provide support for the current recommendations for traditional family style meals in the preschool setting.\textsuperscript{14}

To properly facilitate family meals with children, it is important to understand external
influences on children’s self-served portions. One study experimentally tested the effect of serving utensil size on the child’s intake of self-served entrees. Ultimately, they found that the serving spoon size and the amount of an entrée available indirectly influenced the amount of food the child consumed. Larger serving utensils related to larger intake for the child. When establishing family meals, it is important that children are not only provided guidance through physical assistance and engaging in appropriate social exchanges, such as taking turns, but are also given age appropriate serving utensils and dishware to establish age appropriate portions. The use of child size utensils will help the child understand expectations of serving sizes and behaviors.

Positive Impact of Family Meals

Literature suggests a positive association between the frequency of family meals and food patterns and practices, as well as psychosocial well-being. Through multiple linear regression of a self-administered survey, Gillman found that as the frequency of family dinners increased, the intake of important nutrients such as fiber, calcium, folate, iron, vitamins B6, B12, C, and E increased. Additionally, meals contained a lower glycemic load, as well as lower saturated fat and trans fat intake as a percentage of total daily energy. Further research found that individuals who reported to never have family dinners, were significantly more likely to become overweight and food insecure than those who had dinner 5-7 times per week. Sen looked specifically at the association between family meal frequency and adolescents with problem behaviors after adjusting for family connectedness, parental awareness, other family activities, and any other potentially confounding variables. They found that family dinner frequency is
negatively associated with substance abuse and running away for females; drinking, physical violence, property destruction, stealing, and running away for males. These studies indicate that intervention programs promoting family meals are beneficial.\textsuperscript{16}

**Benefits and Barriers to Family Meals**

To further understand the implications of family meals, parent’s perceived benefits and barriers of eating together as a family have been examined.\textsuperscript{18,19} Parents identified good teaching moments, enhanced family connectedness, and encouraging nutritious meals as benefits to family meal time. However, they also discussed barriers that interfere with the implementation of family meals. These barriers include; child behavior problems, scheduling difficulties, lack of self-efficacy in meal preparation and ill-prepared husbands. Family Style Meal Service is the standard practice in Head Start, whereas Child and Adult Food Care Programs are not required to implement Family Style meals. Head Start and Child and Adult Food Care Programs reported being motivated by the pleasant mealtime family style meals created, the opportunities presented to model healthy eating practices, and the promotion of healthy child development. Those that do not use Family Style meal techniques expressed that it was too resource intensive and messy.\textsuperscript{19} The research explained possible cues to action to address the commonly expressed barriers. One way to address the problems would be to provide educational materials to daycares, as well as parents emphasizing benefits of eating together and tips on how to implement family meals.
Summary of Review of Literature

Many children living in the United States do not meet their fruit and vegetable intake requirements, as established by The American Academy of Pediatrics. This is problematic based on the importance of a balanced diet on proper development throughout childhood. Research also indicates that play group therapy helps with developmental processes such as self-awareness, self-regulation, social communication, empathy, and adoptability in children. Because play group therapy focuses on important developmental processes, failing to include a nutritional component neglects an important component of childhood health and development. The Social Learning Theory concept of modeling, as well as Family Style Meal Service techniques have been shown to increase children’s acceptability to a variety of foods. Due to the evidence of improved social and cognitive development, as well as the familiar environment for behavior change, the play group setting exemplifies a great opportunity for modeling healthy eating behaviors. It is worthwhile to add to the current body of literature and to determine if the inclusion of family meal and modeling techniques are beneficial within the developmental play group setting to address problematic eating behaviors and poor dietary intake.
CHAPTER 3

METHODOLOGY

Research Design

The research design for this study followed a pre-test, post-test design. Eligibility criteria required that the participating child be between 18 and 48 months of age and concern from the child’s caregiver regarding a delay in at least one of the five developmental domains must be evident. The criteria for participation in the study, the intervention, and start/end points were clearly established. Parents that contacted the investigator with interest in their child participating in the intervention were included in the intervention group if they met the inclusion criteria. In this particular intervention, randomized treatment assignment was not feasible. Although sought out and desired, a control group was not utilized in the present study. Permission was obtained from the Institutional Review Board of Northern Illinois University prior to the initiation this study (Appendix A).

Selection of the Sample

The original inclusion criteria indicated that the participant must be between the ages of 18 and 36 months, however in order to increase the sample size, the age limit was extended to include children from 18 to 48 months of age. Additionally, to be screened for inclusion, a concern from the child’s caregiver regarding a delay in at least one of the five developmental...
domains must be evident. The five developmental domains include, Cognitive, Adaptive, Communication, Physical, and Social Emotional and are explained in Table 1.

<table>
<thead>
<tr>
<th>Developmental Domain</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>ability to think, react, and learn</td>
</tr>
<tr>
<td>Adaptive</td>
<td>ability to adapt to daily living demands such as dressing, eating, and self care</td>
</tr>
<tr>
<td>Communication</td>
<td>includes expressive and receptive language</td>
</tr>
<tr>
<td>Physical</td>
<td>may include hearing, vision, gross motor skills, and fine motor skills</td>
</tr>
<tr>
<td>Social Emotional</td>
<td>ability to interact with others and self- regulate emotions</td>
</tr>
</tbody>
</table>

The Interdisciplinary Play Group included 2 sessions; fall and spring. Session began October 9th, 2015 and the second session began February 12th, 2016. Two participant recruitments were conducted. The first was conducted during September and the second recruitment period began early January; approximately 1 month prior to the play group start date. To recruit participants, investigators distributed a flyer (Appendix B) via email to early intervention programs and colleagues. E-mail, phone numbers and the Northern Illinois University Wellness Clinic address were provided on the flyers for parents to communicate with investigators in the most convenient method. In addition, a flyer for recruitment was posted in Northern Illinois University’s Wellness Clinic, Speech and Hearing Clinics, Campus Child Care Center, Child Development Lab and in the offices of the College of Health and Human Sciences and School of Allied Health and Communicative Disorders. The “snowball effect”, where
participating families encouraged other parents to participate, was also an important recruitment method.

To verify eligibility, an initial appointment was scheduled prior to the start of the development play group. During this appointment, the Peabody Developmental Motor Scales-Second Edition, MacArthur-Bates Communicative Development Inventory, and Vineland Adaptive Behavior Scales were used by the Physical Therapist, Occupational Therapist, and Speech Language Pathologist to assess the child’s development within the 5 domains. Importantly, children were not screened based on nutrition, but instead eligibility was based on age and developmental skills. A child was excluded from the study if a developmental delay was not documented in any of the developmental domains or if they were already participating in a therapeutic group activity. Ultimately, 14 children qualified to participate in the Interdisciplinary Developmental Play Group. Below are descriptions of the tools used to verify eligibility for inclusion in the study.\textsuperscript{51,52,53}

**Peabody Developmental Motor Scales- Second Edition (PDMS-2)**

PDMS-2 assesses gross and fine motor development from birth to five years old and is intended to be used by occupational therapists, physical therapists, diagnosticians, early intervention specialists, adapted physical education teachers, psychologists, and others interested in examining motor abilities of children. This assessment tool is composed of six subtests that measure interrelated motor abilities that develop early in life. The subtests are broken into two composites: fine motor quotient (grasping and visual-motor integration) and gross motor quotient (reflexes, stationary, locomotion, and object manipulation). This tool has been tested for
reliability and validity empirically with a normative sample of 2,003 people from 46 states.\textsuperscript{51}

\textbf{Vineland Adaptive Behavior Scales, Second Edition (Vineland-II)}

Vineland-II is a measurement tool used to assess all developmental domains and can be applied to individual’s birth to 90 years old. The domains include communication, daily living skills, socialization, and motor skills. This instrument aids in diagnosing and classifying intellectual and developmental disabilities and other disorders, such as Autism, Asperger Syndrome, and developmental delays.\textsuperscript{52}

\textbf{MacArthur- Bates Communicative Development Inventories- Words and Gestures}

Word and Gesture inventories are parental report instruments, which help illustrate information about a child’s development in early language, including vocabulary comprehension, production, gesture use, and early grammar.\textsuperscript{53}

\textbf{Data Collection}

Data collection for each play group session occurred for 10 consecutive weeks at Northern Illinois University’s Wellness Clinic. Week 1, confirmed the child met inclusion criteria and provided an opportunity to review the procedures, obtain informed consent and complete pre-intervention data collection. In addition to motor and speech development, pre- intervention nutrition information was obtained at this point. Weeks two-nine were the intervention phase, in which parents and children participated in the Interdisciplinary Developmental Play Group led by graduate students. Each session emphasized developmental skills, such as gross motor, fine
motor, communication, meal time behaviors, and self care. Table 2 provides an explanation of the sections of the play group, which together totaled to 2 hours in duration.

Table 2: Sections of the Developmental Play Group and Description

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Circle</td>
<td>The playgroup began with a “Hello” song and themed welcome book</td>
</tr>
<tr>
<td>Fine Motor &amp; Sensory</td>
<td>Children participated in weekly craft with assistance of parents and graduate students. Craft included a sensory component or was followed by use of a sensory table for further exploration</td>
</tr>
<tr>
<td>Self Care</td>
<td>Hand washing</td>
</tr>
<tr>
<td>Snack</td>
<td>Snack time required participation from children, parents, and graduate students. Graduate students and parents were encouraged to assist children in snack preparation and model all eating behaviors. All children and parents sat at crescent shaped table and engaged in “Family Style Meal Service” activities.</td>
</tr>
<tr>
<td>Self Care</td>
<td>Hand washing and brushing teeth</td>
</tr>
<tr>
<td>Free Play</td>
<td>A variety of toys were set out throughout the room and children were given the opportunity to choose where they would like to play. This play was guided by graduate students working one-on-one with each child. Free play also served as a time for parent education</td>
</tr>
<tr>
<td>Gross Motor</td>
<td>Gross motor skills were developed through the use of games and activities that required large body movements, such as parachute activities and obstacle courses</td>
</tr>
<tr>
<td>Closing Circle</td>
<td>The play group ended with a a closing story and the “Time to Say Goodbye” song</td>
</tr>
</tbody>
</table>

The process for data collection remained the same for each Interdisciplinary Developmental Play Group session. During the fall session, there was one play group that ran once-weekly on Fridays from 9:00-11:00am. Due to increased participant demand, there were two play groups during the spring session which ran from 9:15-11:15am and 12:00-2:00pm.
Instrumentation

General Child Harvard Study Food Frequency Questionnaire (HSFFQ)

The HSFFQ (Appendix E) was created and validated by Harvard School of Public Health and used to assess a child’s current diet. The questionnaire requests information regarding the frequency the child consumes a variety of foods. To complete the questionnaire, the parent is asked to mark how often the child has eaten a serving of a variety of foods during the past 4 weeks (0 times in the last 4 weeks, 1-3 times in the last 4 weeks, 1 time per week, 2-4 times per week, 5-6 times per week, once daily, 2-3 times daily, 4-5 times daily, or greater than 6 times daily). Based on parental report, a value was calculated reporting the number of times per day (frequency) the child consumed that food. For example, if a parent marked that their child consumes carrots 1 time per week it was calculated to be equivalent to a frequency of 0.14 (1 time per week/ 7 days) times per day. The pre-intervention and post-intervention scores were compared. The HSFFQ was given during the initial assessment (week one) and again during the follow-up assessment (week 10) to assess any differences in dietary intake following the intervention.

Children’s Eating Behavior Inventory (CEBI)

The CEBI (Appendix F) is intended for children 2-12 years old to assess eating and mealtime problems. It was developed according to a framework based on a transactional and systemic understanding of parent-child relationships. The CEBI is a parent-report form in which the parent rates their child’s behaviors on a scale (never, seldom, sometimes, often, always).
CEBI consists of 40 items; 28 focus on the child (food preferences, motor skills, and behavior compliance) and 12 focus on the parent and family system (parental child behavior controls, cognitions and feelings about feeding one’s child, and interactions between family members). Some items are scored in a positive direction; a response of 1 is scored 1, 2 is scored 2, etc., while others are scored in a negative direction; a response of 1 is scored 5, 2 is scored 4, etc. The number of questions the parent answers varies based on two factors; if the child lives in a one or two parent household and if the child is an only child or has siblings. This variance is corrected for by using an adjusted CEBI score ((total CEBI score/ # items completed) x 40). The CEBI was given during the initial assessment (week one) and again during the follow-up assessment (week 10) to assess any changes in problematic eating behaviors following the intervention.

**Weekly Food Log**

Caregivers were asked to complete weekly food logs. During week one of the play group intervention, the caregiver was provided with a food log and educated on how to estimate portion sizes while their child was participating in free play. The food logs were collected weekly during free play, which allowed for caregivers to ask questions regarding their child’s nutrition. The weekly food log was used as a weekly reference as to the frequency that caregivers were incorporating fruits and vegetables into their child’s diet. Weeks 1, 4, and 8 were analyzed to determine the frequency of which fruits and vegetables were incorporated into the child’s diet weekly, and from that information the average number of times the child was consuming fruits and vegetables per day was calculated. This provided information to determine if more fruits and vegetables were incorporated and accepted at home as the intervention progressed. The food log
and portion guide provided to caregivers is included as Appendix G.

Procedures

Description of the Setting: Developmental Play Group

To keep all participants actively engaged, a horseshoe shaped table was used during snack time. The children and their caregiver sat around the table, while the nutrition investigator sat at the center, so that all participants could see what they were being asked to do regarding participation in snack time. Graduate students were dispersed throughout the room providing guidance. Photos of this set-up are included as Appendix H. During the first week of the intervention, the children created placemats. The placemats included the child’s name and their own drawing/painting on one side and the other side included a picture of “MyPlate” with examples of foods that fit in each food group, as well as a photo of the child. The placemat was used during snack weekly, and those who were able, were asked to assist in setting the table, including placemats, napkins, plates/bowls, and eating utensils. During the first week of the play group, a meal planning technique, “MyPlate” was explained to parents as a way to increase variety within meals and ensure the intake of adequate fruits and vegetables. The children were sent home with “MyPlate” plates to encourage the inclusion of a variety food groups with meals.

Play Group Structure and Procedures

The Interdisciplinary Developmental Play Group met once-weekly, for 8 successive weeks for a duration of 2 hours. Graduate students provided individualized attention to help caregiver-toddler pairs explore the group setting. The session was broken up into play-based sections
including a welcome circle with stories and songs, fine motor activities, sensory activities, family meal style snack time, gross motor activities, and closing circle with stories and songs. The play group provided opportunities for structured, routine activities as well as free play and socialization.

Each week the play group was structured around a theme. Some examples include: “All About Me”, “Animals”, “Camping”, and “Winter”. To engage the children, snack time also followed the weekly theme. Snack included at least one fruit or vegetable and required the children to actively participate in snack time. Children were asked to participate with the guidance of their caregiver in a variety of way including: preparation, assembly, passing snack items around the table, requesting more of a snack item, and clean up. During the fall session, 5 weeks focused on fruit and 5 weeks focused on vegetables. The spring session snacks focused on fruit 6 times and vegetables 4 times. Variations in snack existed between sessions based on the weekly theme and the children’s level of functioning, but a fruit or vegetable was always offered (Table 3 and Table 4).

Description of the Intervention: Family Style Meal Service and Modeling of Food Intake

The nutrition investigator prepared snack time ingredients which needed to be cut, chopped, or washed prior to snack time. Snack time lasted 25 minutes and encouraged participation from everyone in the room. Bowls containing ingredients for snack were placed on the table within the child’s reach and children were encouraged to serve themselves each of the ingredients using age-appropriate utensils. Speech Language, Physical Therapy, and Nutrition and Dietetics graduate students encouraged eating by modeling words, helping with hand grip,
scooping, and spreading, and importantly, modeling the intake of all snack items offered.

Table 3: Description of Weekly Snacks for Fall Session

<table>
<thead>
<tr>
<th>Weekly Theme</th>
<th>Snack</th>
<th>Food Groups Included</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1: All About Me</strong></td>
<td>“Happy Face”</td>
<td>Grains</td>
</tr>
<tr>
<td></td>
<td>Ingredients: Tortilla, apple, raspberries, banana, kiwi, cream cheese spread (cream cheese, brown sugar, vanilla)</td>
<td>Dairy, Fruit</td>
</tr>
<tr>
<td><strong>Week 2: Gardening</strong></td>
<td>“Veggie Sushi”</td>
<td>Veggies, Dairy</td>
</tr>
<tr>
<td></td>
<td>Ingredients: zucchini, cucumber, red pepper, carrots, onion and chive cream cheese</td>
<td></td>
</tr>
<tr>
<td><strong>Week 3: Fall</strong></td>
<td>“Fall Fun!”</td>
<td>Veggies, Protein</td>
</tr>
<tr>
<td></td>
<td>Corn &amp; Bean salsa ingredients: corn, black beans, cilantro, lime, olive oil, tomatoes, red onion Sweet potato chips ingredients: sweet potatoes, salt, olive oil</td>
<td></td>
</tr>
<tr>
<td><strong>Week 4: Camping</strong></td>
<td>“I want S’more!” Trail Mix</td>
<td>Veggies, Protein</td>
</tr>
<tr>
<td></td>
<td>Ingredients: Teddy Graham crackers, marshmallows, dark chocolate chips, banana chips</td>
<td></td>
</tr>
<tr>
<td><strong>Week 5: Animals</strong></td>
<td>“Ants and Animals on a Log”</td>
<td>Veggies, Protein</td>
</tr>
<tr>
<td></td>
<td>Ingredients: celery, peanut butter, Nutella, raisins, animal crackers</td>
<td></td>
</tr>
<tr>
<td><strong>Week 6: Pirates</strong></td>
<td>“Pirates Love Pizza”</td>
<td>Grains, Dairy, Veggies</td>
</tr>
<tr>
<td></td>
<td>Ingredients: plain Greek yogurt, cream cheese, ranch dip seasoning, English muffin, carrots, cucumber, red pepper, shredded cheddar cheese</td>
<td></td>
</tr>
<tr>
<td><strong>Week 7: Transportation</strong></td>
<td>“Fruit Stoplight”</td>
<td>Fruit, Grains, Dairy</td>
</tr>
<tr>
<td></td>
<td>Ingredients: kiwi, bananas, raspberries, crackers, cream cheese</td>
<td></td>
</tr>
<tr>
<td><strong>Week 8: Winter</strong></td>
<td>“Melted Olaf”</td>
<td>Grains, Dairy, Veggies</td>
</tr>
<tr>
<td></td>
<td>Ingredients: vanilla yogurt, blueberries, carrots, pretzels</td>
<td></td>
</tr>
</tbody>
</table>

5 weeks included vegetables
5 weeks included fruit
### Table 4: Description of Weekly Snacks for Spring Session

<table>
<thead>
<tr>
<th>Weekly Theme</th>
<th>Snack</th>
<th>Food Group Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1: All About Me</td>
<td>“Happy Face”</td>
<td>Grains</td>
</tr>
<tr>
<td></td>
<td>Ingredients: Tortilla, apple, raspberries, banana, kiwi, cream cheese spread</td>
<td>Dairy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruit</td>
</tr>
<tr>
<td>Week 2: Gardening</td>
<td>“Into the Garden!”</td>
<td>Veggies</td>
</tr>
<tr>
<td></td>
<td>Ingredients: plain hummus, cucumber, red pepper, carrots, celery, sweet potatoes, olive oil, salt</td>
<td>Dairy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protein</td>
</tr>
<tr>
<td>Week 3: Camping</td>
<td>“Happy Trails”</td>
<td>Fruit</td>
</tr>
<tr>
<td></td>
<td>Ingredients: dark chocolate chips, pretzels, rice chex, dried banana chips, cheddar bunnies, dried apricots</td>
<td>Grains</td>
</tr>
<tr>
<td>Week 4: Spring</td>
<td>Sunflower “Energy Bites”</td>
<td>Fruit</td>
</tr>
<tr>
<td></td>
<td>Ingredients: oatmeal, sun butter, dark chocolate chips, banana, honey, chia seeds, coconut flakes</td>
<td>Protein</td>
</tr>
<tr>
<td>Week 5: Animals</td>
<td>“Cat Sandwich”</td>
<td>Veggies</td>
</tr>
<tr>
<td></td>
<td>Ingredients: bread, cheese, carrots, tomatoes, cucumber</td>
<td>Dairy</td>
</tr>
<tr>
<td>Week 6: Pirates</td>
<td>“Pirates Love Pizza”</td>
<td>Grains</td>
</tr>
<tr>
<td></td>
<td>Ingredients: plain Greek yogurt, cream cheese, ranch dip seasoning, English muffin, carrots, cucumber, red pepper, cheddar cheese</td>
<td>Dairy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Veggies</td>
</tr>
<tr>
<td>Week 7: Transportation</td>
<td>“Fruit Stoplight”</td>
<td>Fruit</td>
</tr>
<tr>
<td></td>
<td>Ingredients: kiwi, bananas, raspberries, graham crackers, honey cream cheese</td>
<td>Grains</td>
</tr>
<tr>
<td>Week 8: Summer</td>
<td>“Fish Sandwich”</td>
<td>Grains</td>
</tr>
<tr>
<td></td>
<td>Ingredients: bread, cheese, carrots, tomatoes, cucumber</td>
<td>Dairy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Veggies</td>
</tr>
</tbody>
</table>

4 weeks included vegetables
6 weeks included fruit
Additionally, caregivers helped their child throughout the snack time, by using hand-over-hand grip and were encouraged to model the intake of snack items. Caregivers were encouraged to participate in snack time and model the intake of foods offered. The goal was to encourage exploration of various healthful snack choices through child and caregiver participation in snack time through setting the table, preparing snack, and determining their own preferences, while also being encouraged through modeling of healthful meal time behaviors. Caregivers were encouraged to try the snack at home, implement family style meal service, and model healthful intake throughout the week.

**Weekly Handouts**

Each week the parent/caregiver received “step-by-step” directions for the weekly snack including pictures, number of servings of fruits or vegetables included in the snack, and any alternate options for the snack. Additionally, a “Healthy Tips for Picky Eater” handout, created by The United States Department of Agriculture, was given the first week. These handouts were provided to encourage caregivers to continue practicing Family Style Meal Service, child involvement in meal time, and modeling of healthful eating behaviors at home throughout the week. A sample weekly handout is included as Appendix I.

**Weekly Email Reminders**

The Thursday before the Friday play group, each caregiver received an email in which the nutrition investigator reminded the caregiver to bring their child’s completed food log to play group and included highlights of the next day’s snack and activities.
Data Monitoring and Safety

Potential risks associated with this intervention included choking and allergic reactions. To avoid these risks, all caregivers were asked to provide information regarding food allergies, intolerances, or sensitivities at the initial assessment. These items were recorded and foods containing these ingredients were not included at any point throughout the study. To prevent choking, fruit and vegetables were cut in small pieces and ample supervision was present at all times. Each child was supervised by their caregiver as well as at least one graduate student at all times. Further, health care professionals were available if additional assistance was required.

Data Confidentiality

All participant information and data obtained throughout the intervention was kept confidential and locked in a file cabinet in Registered Dietitian’s or Physical Therapists’ office. Data input took place using a secured computer at Northern Illinois University. Each participant was randomly assigned a codename, which included numbers and letters, to maintain confidentiality throughout data analysis. Additional Developmental Play Group information was kept secured through an invitation based shared drive. Only investigators actively involved in data collection and analysis were included in the shared drive.

Quantitative Data Analysis

Of the 14 children consenting to participate in the intervention, 2 children did not complete the post-intervention questionnaires and therefore were excluded from all analysis. A
total of 12 children completed both the pre- and post- intervention “General Child Harvard Study Food Frequency Questionnaire”. A total of 11 of the 12 participants completed the pre- and post-intervention “Children’s Eating Behavior Inventory”. Frequencies and means were calculated to describe the demographic characteristics of the study participants.

A Wilcoxon signed rank test was used to compare pre- and post-intervention Children’s Eating Behavior Inventory Scores and intake as measured by the General Child Harvard Study to assess any changes between pre-intervention and post-intervention and determine statistical significance. Each child’s daily intake of fruits, vegetables, dairy, protein, sugar sweetened foods and beverages, and salty snacks were determined based on the General Child Harvard Study Food Frequency Questionnaire and Child Eating Behavior Inventory score for pre- and post-play group intervention were determined as described in the instruments section of this study.

Additionally, a single subject design was used to look at each child’s progress individually. All statistical analysis was performed using SPSS 22. Table 5 explains how each research question was addressed in the present study.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Hypothesis</th>
<th>Variables</th>
<th>Statistical Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the incorporation of a family style snack routine and use of modeling techniques positively affect a child’s willingness to consume nutrient dense foods, and therefore increase the frequency of consumption?</td>
<td>Family meal style service and modeling techniques during snack time will positively influence the intake of nutrient dense foods as measured by General Child Harvard Study Food Frequency Questionnaire among children with developmental delays participating in an interdisciplinary play group as reported by parents/caregivers.</td>
<td>Intake of nutrient dense foods including, fruits, vegetables, dairy, and protein</td>
<td>Wilcoxon Signed Ranks Test</td>
</tr>
<tr>
<td>Does the incorporation of a family style snack routine and use of modeling techniques positively affect a child’s willingness to consume nutrient dense foods, and therefore decrease consumption of energy dense foods?</td>
<td>Family meal style service and modeling techniques during snack time will decrease the intake of energy dense foods as measured by General Child Harvard Study Food Frequency Questionnaire among children with developmental delays participating in an interdisciplinary play group as reported by caregivers/parents.</td>
<td>Intake of energy dense foods including sugar sweetened foods and beverages and salty snacks.</td>
<td>Wilcoxon Signed Ranks Test</td>
</tr>
<tr>
<td>Does the incorporation of a family style snack routine and use of modeling techniques positively affect a child’s eating and meal time behaviors?</td>
<td>Family meal style service and modeling techniques during snack time will reduce problematic eating and meal time behaviors as measured by Children’s Eating Behavior Inventory among children with developmental delays participating in an interdisciplinary play group as reported by parents/caregivers.</td>
<td>Eating and meal time behaviors</td>
<td>Wilcoxon Signed Ranks Test</td>
</tr>
</tbody>
</table>
CHAPTER 4

RESULTS

Research Methodology

The purpose of this study was to assess the impact of family style meal service, active child involvement, and modeling techniques during snack time on dietary intake and eating behaviors among children with developmental delays participating in an interdisciplinary developmental play group. Modeling included motor skills, communication, and consumption of a variety of healthy snacks including fruits, vegetables, whole grains, and dairy products. Caregivers were required to complete pre-intervention questionnaires including The General Child Harvard Study Food Frequency Questionnaire and The Children’s Eating Behavior Inventory concerning their child. They then were required to complete 8 weeks of a once-weekly play group, and follow-up with post-intervention Food Frequency Questionnaire and Eating Behavior Inventory. Further, caregivers were required to provide demographic information on themselves and their child (Appendix J). Ultimately, 12 children completed the 10-week program, including 1 week of pre-intervention evaluation, followed by 8- weeks of a once-weekly play group, and ending with a follow-up evaluation. The children, their caregivers, and graduate students worked to develop fine motor skills, gross motor skills, language skills, self care skills, and appropriate meal time behaviors and skills. The statistical significance was set at $\sigma < 0.05$, thus the probability that random chance could explain the results is 5%.
Participants

The mean age of the participants was 29.15 months, with the minimum age being 18 months and the maximum age being 48 months. The sample (n=12) was predominantly Caucasian (91.67%), with one participant being Hispanic-Caucasian (8.33%). The demographic characteristics of the participants are provided in Table 6.

Table 6: Demographic characteristics of participants

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>n=12</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>2 (16.67)</td>
<td></td>
</tr>
<tr>
<td>25-30</td>
<td>6 (50.00)</td>
<td></td>
</tr>
<tr>
<td>31-36</td>
<td>2 (16.67)</td>
<td></td>
</tr>
<tr>
<td>37-42</td>
<td>1 (8.33)</td>
<td></td>
</tr>
<tr>
<td>43-48</td>
<td>1 (8.33)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex</th>
<th>n=12</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>6 (50.00)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>6 (50.00)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>n=12</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>11 (91.67)</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Caucasian</td>
<td>1 (8.33)</td>
<td></td>
</tr>
</tbody>
</table>

To participate in the intervention, the child was required to have a documented delay in at least 1 of the 5 developmental domains. The children’s development was assessed using the Peabody Developmental Motor Scales- Second Edition, MacArthur-Bates Communicative Development Inventory, and Vineland Adaptive Behavior Scales. The participants had predominantly motor, communication, and personal/social delays. The children that participated in the study had a range of 2 to 5 documented delays; 8 (66.7%) had a motor delay, 11 (91.67%) had a communication delay, 6 (50%) had an adaptive delay, 1 (8.33%) had a cognitive/problem solving delay, and 7 (58.33%) had a personal/social delay (Table 7).
Table 7: Documented Developmental Delays

<table>
<thead>
<tr>
<th>Participant</th>
<th>Motor Delay</th>
<th>Communication Delay</th>
<th>Adaptive Delay</th>
<th>Cognitive/Problem Solving Delay</th>
<th>Personal/Social Delay</th>
<th>Total # of domains delayed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>11</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>33</td>
</tr>
</tbody>
</table>

“1” indicates that the child was diagnosed with the corresponding delay, and a “0” indicates that the child does not have a delay in that area.

Demographic characteristics of the family units are included as Table 8. All parents had at least a high school education. Older siblings tend to serve as role models at home, so the number of older siblings each participant had at home was obtained. The majority of participants had 0 older siblings, but the range was 0 to 3 older siblings.

Table 8: Demographic characteristics of family unit

<table>
<thead>
<tr>
<th>Parent Education Level</th>
<th>n (%)</th>
<th>n=13</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school diploma</td>
<td>5 (41.67)</td>
<td></td>
</tr>
<tr>
<td>Technical degree</td>
<td>2 (16.67)</td>
<td></td>
</tr>
<tr>
<td>Associates</td>
<td>1 (8.33 )</td>
<td></td>
</tr>
<tr>
<td>Bachelors</td>
<td>2 (16.67)</td>
<td></td>
</tr>
<tr>
<td>Masters</td>
<td>1 (8.33 )</td>
<td></td>
</tr>
<tr>
<td>Doctorate</td>
<td>1 (8.33 )</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of older siblings</th>
<th>n (%)</th>
<th>n=13</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5 (41.67)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2 (16.67)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4 (33.34)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1 (8.33 )</td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis 1 examined the impact of Family Style Meal Service and modeling techniques during snack time on intake of nutrient dense foods (fruit, vegetables, dairy, protein) among children with developmental delays participating in an interdisciplinary play group as measured by the General Child Harvard Study Food Frequency Questionnaire. Nutrient dense foods are foods that have a large amount of nutrients in comparison to their caloric value.

A single subject analysis showed that 2 (16.67%) participants consumed more vegetables post-intervention. The maximum pre-intervention intake of vegetables was 3.79 times per day and the minimum pre-intervention intake of vegetables was 0.79 times per day. Post-intervention, the maximum intake was 2.43 times per day and in the minimum intake was 0.14 times per day. According to the single subject analysis, 6 (50%) participants consumed more fruit post-intervention. The maximum pre-intervention intake of fruit was 7.93 times per day and the minimum pre-intervention intake of fruit was 0 times per day. Post-intervention, the maximum intake was 6.87 times per day and in the minimum intake was 0 times per day.

Regarding dairy intake, the single subject design revealed that 7 (58.33%) participants consumed more servings of dairy per day following the 8-week intervention. The maximum pre-intervention intake of diary was 4.50 times per day and the minimum pre-intervention intake of fruit was 0.79 times per day. Post-intervention, the maximum intake was 7.50 times per day and in the minimum intake was 0 times per day. A single subject representation of the data is included as Table 9.
Table 9: Number of times per day children consumed nutrient dense foods pre-and post-intervention

<table>
<thead>
<tr>
<th>Participant</th>
<th>Pre-Intervention: Number of Servings</th>
<th>Post-Intervention: Number of Servings</th>
<th>Change in intake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fruit</td>
<td>Vegetables</td>
<td>Dairy</td>
</tr>
<tr>
<td>1</td>
<td>5.79</td>
<td>1.93</td>
<td>0.79</td>
</tr>
<tr>
<td>2</td>
<td>0.99</td>
<td>2.07</td>
<td>3.43</td>
</tr>
<tr>
<td>3</td>
<td>2.71</td>
<td>1.72</td>
<td>2.43</td>
</tr>
<tr>
<td>4</td>
<td>3.15</td>
<td>0.79</td>
<td>3.36</td>
</tr>
<tr>
<td>5</td>
<td>7.93</td>
<td>1.72</td>
<td>4.50</td>
</tr>
<tr>
<td>6</td>
<td>6.86</td>
<td>0.91</td>
<td>3.64</td>
</tr>
<tr>
<td>7</td>
<td>5.30</td>
<td>2.92</td>
<td>3.36</td>
</tr>
<tr>
<td>8</td>
<td>4.50</td>
<td>3.21</td>
<td>1.93</td>
</tr>
<tr>
<td>9</td>
<td>0.00</td>
<td>1.29</td>
<td>2.57</td>
</tr>
<tr>
<td>10</td>
<td>2.43</td>
<td>1.13</td>
<td>4.29</td>
</tr>
<tr>
<td>11</td>
<td>2.43</td>
<td>1.20</td>
<td>4.08</td>
</tr>
<tr>
<td>12</td>
<td>3.58</td>
<td>3.79</td>
<td>4.29</td>
</tr>
<tr>
<td>Mean</td>
<td>3.81</td>
<td>1.89</td>
<td>3.22</td>
</tr>
</tbody>
</table>
On average, dairy and fruit intake increased, while vegetables and protein intake decreased following the 8-week snack time intervention. Consumption of fruit increased from an average of 3.81 times per day to 3.82 times per day. Consumption of vegetables decreased from 1.89 times per day to 1.12 times per day. Consumption of dairy intake increased from 3.22 times per day to 3.56 times per day. Consumption of protein decreased from 1.95 times per day to 1.79 times per day. Figure 1, below, provides a visual representation of this.

Figure 1: Mean daily intake of nutrient dense foods

Wilcoxon Signed Rank Tests for fruit (Z = 0.314, p = 0.754), dairy (Z = 0.533, p = 0.594), and protein (Z = 0.471, p = 0.638) did not produce significant results, and therefore the null hypothesis, that the difference between pairs of observations is zero, cannot be rejected. A Wilcoxon Signed Rank Test for vegetable intake pre-intervention and post-intervention indicated
that vegetable intake decreased over the 8-week intervention, \( p = 0.041 \) (\( Z = -2.04 \)), and therefore the null hypothesis that the difference between pairs of observations is zero was rejected. This analysis indicates that the snack time intervention had a negative impact on vegetable consumption, however further research needs to be conducted to determine confounding variables that may have negatively impacted the participant’s intake.

To describe relationships among population demographics and participant change in dietary intake, as evidenced by the General Child Harvard Study Food Frequency Questionnaire cross tabulations were run. The child’s gender did not impact their intake of vegetables post-intervention. However, as indicated previously, 6 (50%) of participant’s showed a decrease in fruit intake following the intervention. Of the 6 that showed an increase in fruit consumption, 5 (83.33%) were girls. Further, of the 6 that showed a decrease in fruit consumption, 5 (83.33%) were boys. Regardless of the child’s gender, there was no difference noted in change in vegetable intake. The number of domains delays and the area the delay(s) were in, did not appear to correlate with change in intake. Further, it is unclear whether the area of delay had an impact on the impact of the intervention on dietary intake. Participants that showed a decrease in their intake of nutrient dense foods varied in the domain in which they expressed a delay.

Hypothesis 2 examined the impact of family meal style service and modeling techniques during snack time on intake of energy dense foods among children with developmental delays participating in a play group, as measured by the General Child Harvard Study Food Frequency Questionnaire. Energy dense foods contain a substantial amount of calories relative to its weight in grams. Sugar sweetened foods and beverages on the General Child Harvard Study Food Frequency questionnaire included the following: ice cream, pudding, cookies, brownies,
cake/cupcake, pie, jello, candy bar, other candy, juice, and regular soda pop. Daily servings of sugar sweetened foods and beverages decreased in 7 (58.33%) participants. This is clarified on a single subject basis in Table 10.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Pre-Intervention: Number of Servings</th>
<th>Post-Intervention: Number of Servings</th>
<th>Change in intake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sugar Sweetened Foods and Beverages</td>
<td>Salty Snacks</td>
<td>Sugar Sweetened Foods and Beverages</td>
</tr>
<tr>
<td>1</td>
<td>1.77 0.64</td>
<td>2.4 1.07</td>
<td>+0.63 0.43</td>
</tr>
<tr>
<td>2</td>
<td>5.13 1.36</td>
<td>2.27 1.36</td>
<td>-2.8616 0</td>
</tr>
<tr>
<td>3</td>
<td>2.92 1.22</td>
<td>3.21 1.72</td>
<td>+0.29 0.5</td>
</tr>
<tr>
<td>4</td>
<td>2.78 1.22</td>
<td>1.93 1.72</td>
<td>-0.85 0.5</td>
</tr>
<tr>
<td>5</td>
<td>5.50 1.57</td>
<td>8.86 2.00</td>
<td>+3.36 0.43</td>
</tr>
<tr>
<td>6</td>
<td>1.28 0.57</td>
<td>0.85 0.71</td>
<td>-0.43 0.14</td>
</tr>
<tr>
<td>7</td>
<td>3.42 1.93</td>
<td>3.92 1.43</td>
<td>+0.2 0.5</td>
</tr>
<tr>
<td>8</td>
<td>3.42 1.43</td>
<td>1.71 0</td>
<td>-1.71 1.43</td>
</tr>
<tr>
<td>9</td>
<td>2.43 0.57</td>
<td>4.64 2.28</td>
<td>+2.21 1.71</td>
</tr>
<tr>
<td>10</td>
<td>5.14 3.93</td>
<td>2.92 2.14</td>
<td>-2.22 1.79</td>
</tr>
<tr>
<td>11</td>
<td>7.00 3.93</td>
<td>6.42 2.14</td>
<td>-0.58 1.79</td>
</tr>
<tr>
<td>12</td>
<td>1.5 0.28</td>
<td>1.49 0.14</td>
<td>-0.01 0.14</td>
</tr>
<tr>
<td>Mean</td>
<td>3.52 1.55</td>
<td>3.38 1.39</td>
<td>-0.14 0.19</td>
</tr>
</tbody>
</table>

The maximum pre-intervention intake of sugar sweetened foods and beverages was 7 times per day and the minimum pre-intervention intake of sugar sweetened foods and beverages
was 1.28 times per day. Post-intervention, the maximum intake was 8.86 times per day and in the minimum intake was 0.85 times per day. Daily intake of salty snacks decreased in 5 (41.67%) participants. Salty snacks on the General Child Harvard Study Food Frequency Questionnaire included: chips, popcorn, pretzels, and crackers. The maximum pre-intervention intake of salty snacks was 3.93 times per day and the minimum intake was 0.28 times per day. Post-intervention, the maximum intake of salty snacks was 2.28 times per day and the minimum intake was 0 times per day.

The mean pre-intervention daily intake of sugar sweetened foods and beverages and salty snacks decreased following the 8-week intervention. Pre-intervention intake of sugar sweetened foods and beverages was a frequency of 3.52 times per day, which decreased to 3.38 servings per day post-intervention.

![Average Daily Intake of Energy Dense Foods](image)

Figure 2: Mean daily intake of energy dense food

However, Wilcoxon Signed Rank Test did not show the decrease in average consumption of sugar sweetened foods and beverages ($Z = 0.471, p = 0.638$) to be significant, and therefore the null hypothesis, that the difference between pairs of observations is zero, cannot be rejected.
The mean pre-intervention intake of salty snacks was 1.55 times per day and the median post-intervention intake of salty snacks was 1.39 servings per day. A Wilcoxon Signed Rank Tests did not show the decrease in intake of salty snacks to be significant ($Z = 0.312, p = 0.755$), and therefore the null hypothesis, that the difference between pairs of observations is zero, cannot be rejected.

**Children’s Eating Behavior Inventory:**

**An Assessment of Eating Behaviors**

It was hypothesized that Family Style Meal Service and modeling techniques during snack time would reduce problematic eating and meal time behaviors, as measured by Children’s Eating Behavior Inventory, among children with developmental delays participating in a developmental play group. A pre- and post- intervention eating behavior inventory was completed by caregivers. The Children’s Eating Behavior Inventory assessed a variety of meal time behaviors before and after the implementation of the 8-week snack time intervention. The questionnaire included questions regarding the child (food preferences, motor skills, and behavior compliance), as well as the parent and family system (parental child behavior controls, cognitions and feelings about feeding one’s child, and interactions between family members). One participant did not complete the pre-intervention Children’s Eating Behavior Inventory, however 8 (72.7%) of the 11 participants that accurately completed the questionnaire showed a decrease in problematic eating behaviors post-intervention (Table 11).

The null hypothesis, that the mean difference between pairs of observations is zero, was rejected. A Wilcoxon signed rank test showed that the difference between pre- and post-
intervention measurements was significant \((Z=-2.247, p=0.025)\). The post-intervention scores (mean = 97.46) were significantly lower than the pre-test scores (mean = 90.24). With this information, we can assume that the snack time intervention during the Interdisciplinary Developmental Play Group had a positive influence on child’s eating and meal time behaviors.

Table 11: Pre- and post-intervention score for eating and meal time behaviors

<table>
<thead>
<tr>
<th>Participant</th>
<th>Child’s Eating Behavior Inventory</th>
<th>Pre- Intervention</th>
<th>Post- Intervention</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adjusted Score</td>
<td>107.69</td>
<td>113</td>
<td>-5.31</td>
</tr>
<tr>
<td>2</td>
<td>Adjusted Score</td>
<td>102.56</td>
<td>92.31</td>
<td>10.25</td>
</tr>
<tr>
<td>3</td>
<td>Adjusted Score</td>
<td>96</td>
<td>88</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Adjusted Score</td>
<td>100.57</td>
<td>86</td>
<td>14.57</td>
</tr>
<tr>
<td>5</td>
<td>Adjusted Score</td>
<td>97.43</td>
<td>85</td>
<td>12.43</td>
</tr>
<tr>
<td>6</td>
<td>Adjusted Score</td>
<td>73.84</td>
<td>63.59</td>
<td>10.25</td>
</tr>
<tr>
<td>7</td>
<td>Adjusted Score</td>
<td>88</td>
<td>95</td>
<td>-7</td>
</tr>
<tr>
<td>8</td>
<td>Adjusted Score</td>
<td>123</td>
<td>110</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Adjusted Score</td>
<td>106</td>
<td>114</td>
<td>-8</td>
</tr>
<tr>
<td>10</td>
<td>Adjusted Score</td>
<td>85</td>
<td>72</td>
<td>13</td>
</tr>
<tr>
<td>11</td>
<td>Adjusted Score</td>
<td>92</td>
<td>87</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Adjusted Score</td>
<td>---</td>
<td>76.92</td>
<td>---</td>
</tr>
</tbody>
</table>

| Mean        | Overall Score                     | 97.46             | 90.24              | 7.22 point eating behavior improvement |

The relationship between problematic eating behaviors and gender, number of developmental delays, and developmental domain of delay. The majority of children had a decrease in problematic eating behaviors post-intervention, however 3 children’s Eating Behavior Inventory indicated that their problematic eating behaviors increased. Cross tabulation indicated that of the 3 participants that had an increase in problematic eating behaviors, 2 of those were boys. Therefore, 33.33% of boys showed an increase in problematic eating behaviors and 16.67% of boys showed a decrease in problematic eating behaviors. The number of delays a child presented with did not prove to be correlated with the child’s score on the Eating Behavior Inventory. The type of developmental delay the child presented with did show a correlation with a lack of improvement in problematic eating behaviors. Of the 3 children that did not show an improvement in problematic eating behaviors, 3 presented with a communication and social/personal delay. Additionally, 2 of the 3 children presented with a motor delay.

Table 12: CEBI scores Pre- and Post- Intervention

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Pre-Intervention (n=11)</th>
<th>Post-Intervention (n=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>97.46 ± 13.04*</td>
<td>90.24 ±15.90*</td>
</tr>
<tr>
<td>Median</td>
<td>97.43</td>
<td>87.50</td>
</tr>
<tr>
<td>Minimum</td>
<td>73.84</td>
<td>63.59</td>
</tr>
<tr>
<td>Maximum</td>
<td>123.00</td>
<td>114.00</td>
</tr>
</tbody>
</table>

*p = 0.025
Weekly Food Logs

As explained in the methodology section, weekly foods logs were collected to provide a dietary snapshot of progress, regarding inclusion of fruit and vegetables that occurred at home throughout the 8-week intervention. This analysis focused on fruits and vegetable because current statistics indicate that fruits and vegetables are the more frequent food groups to be deficient in toddlers and young children. Based on the information provided by caregivers, the participants average daily intake of fruit and vegetables was calculated. Food logs from weeks 1, 4, and 8 were analyzed. Mean fruit consumption at home increased from a frequency of 1.56 times per day during week 1 to 1.68 times per day during week 4 and to 1.93 times per day during week 8 (Figure 3). A Wilcoxon Signed Ranks Test indicates that the increases in fruit intake from week 1 to 4 (Z = 0.802, p = 0.422), week 4 to 8 (Z = 1.26, p = 0.207), and week 1 to 8 (Z = 1.16, p = 0.247) are not statistically significant (p < 0.05).

Figure 3: Mean intake of fruit per day consumed at home as indicated by weekly food logs.
Mean vegetable consumption at home increased from week 1 to 4, but a mean decrease was noted from week 4 to 8. During week 1, vegetables were consumed, on average, 0.40 times per day, which increased to 0.59 times per day during week 4. However, there was a drop in servings per day at week 8, with an average intake being 0.42. Inclusion and consumption of vegetables during week 8 was higher than week 1, but lower than week 4. Figure 4 represents this information in graphical form.

Figure 4: Mean intake of vegetables per day consumed at home as indicated by weekly food logs.

A Wilcoxon Signed Ranks Test indicates that the increase in vegetable intake from week 1 to 4 ($Z = 1.43$, $p = 0.154$) and week 1 to 8 ($Z = 0.157$, $p = 0.88$) are not statistically significant. Further, the decrease in vegetables consumption from week 4 to week 8 was not statistically significant ($Z = 1.29$, $p = 0.197$).
CHAPTER 5
DISCUSSION

The present study examined the impact of Family Style Meal Service, active child involvement in snack time, and modeling techniques within a developmental play group setting on children’s dietary intake and eating behaviors over an 8-week play group intervention. Dietary intake and problematic eating behaviors pre- and post- snack time intervention were compared. The importance of a balanced diet, including variety, is understood to begin in childhood, however many children, especially those with developmental delays, are selective or picky eaters leaving them at risk for nutritional insufficiencies. These findings are particularly important given that eating habits are developed early on in life, and are highly influenced by caregivers and peers. Based this information, it is evident that nutrition interventions, which promote healthy eating behaviors, are important for this subset of the population and programs which include an opportunity for healthful modeling are integral to success.

Current research provides insight on the benefits of play groups, but lacks investigation of utilizing the play group setting, in which Family Style Meal Service and modeling techniques can be implemented, as an approach to addressing dietary and meal time difficulties among children with developmental delays. This project served as a pilot study aimed at gaining a better understanding of the impact of the social setting of a play group, along with
family style meal service, active child participation, and modeling of caregivers, peers, and graduate students, on dietary intake and eating behaviors. Early Intervention is typically used to assist children with developmental delays, however because Early Intervention is individually based the social component of learning is not specifically addressed or utilized for reaching developmental milestones. Previous studies with young children have investigated the nutritional adequacy of children with typical development in comparison to children with developmental delays, play group therapy as a place for physical and mental growth, Family Meal Style Service to promote health, and the impact of peers and caregivers on intake, separately. However, the present study builds upon this information by utilizing the play group setting as a place to implement Family Style Meal Service, active child participation, and modeling techniques to promote variety and healthy choices in children with developmental delays, as well as improve eating and meal time behaviors.

Three hypotheses were tested and included:

1. Family meal style service, active child participation, and modeling techniques during snack time will positively influence the intake of nutrient dense foods, as measured by The General Child Harvard Study Food Frequency Questionnaire, among children with developmental delays participating in an interdisciplinary developmental play group.

2. Family meal style service, active child participation, and modeling techniques during snack time will reduce the intake of energy dense foods, as measured by The General Child Harvard Study Food Frequency Questionnaire, among children with developmental delays participating in an interdisciplinary developmental play group.
3. Family meal style service, child involvement in snack time, and modeling techniques during snack time will reduce problematic eating and meal time behaviors, as measured by The Children’s Eating Behavior Inventory, among children with developmental delays participating in an interdisciplinary developmental play group.

Two hypotheses were based on responses from The General Child Harvard Study Food Frequency Questionnaire. Average changes in consumption included an increase in fruit and dairy intake and a decrease in vegetable and protein intake. Wilcoxon Signed Ranks Tests showed that the changes in consumption of fruits, dairy, and protein were not significant. However, the decrease in vegetable intake was proven to be significant. This analysis indicates that snack time intervention had a negative impact on vegetable consumption, however confounding variables that may have impacted the intake of vegetables must be addressed and further researched. As indicated by the Center for Disease Control and The Feeding Infants and Toddlers Study, it is challenging to get children to consume adequate amounts of vegetables. This limited intake may be a result of various factors, but commonly includes picky/selective eating and parental dietary intake. Recall that 9 in 10 children living in the United States do not consume the recommended daily servings of vegetables. Additionally, parents did not necessarily choose to participate in the developmental play group based on a specific concern or interest regarding their child’s nutrition. Instead, the parents became involved in the developmental play group based on a concern regarding their child’s development within the five domains of development (cognitive, adaptive, communication, physical, and/or social emotional). This may have impacted the parent’s interest and willingness in promoting the intake of vegetables in the home, when they had larger concerns regarding their child’s development.
Moreover, focusing on nutrition is an additional battle that many parents may have chosen not to fight.

Based on analysis of weekly food logs, it is evident that more involvement outside of the play group is required from caregivers. Although, on average, fruit intake at home increased throughout the 8-week intervention the results did not prove to be statistically significant based on Wilcoxon Signed Ranks Test. An increase in vegetable consumption was seen between weeks 1 and 4, but was not seen between weeks 4 and 8 and these results were not shown to be statistically significant based on the Wilcoxon Signed Ranks Test. This may indicate that in order to see greater changes in child dietary intake over the course of the intervention, caregivers need to implement changes and continue to encourage healthful dietary practices in the household to a greater degree. It is unclear as to why a decrease in average vegetable consumption was seen at home during week 8, however greater involvement from caregivers and continuation of snack and meal time techniques in the home would be required.

The second hypothesis was based on the intake of energy dense foods pre- and post-intervention. Although the null hypothesis cannot be rejected based on the results of the Wilcoxon Signed Ranks Test, a decrease in the average intake of sugar sweetened foods and beverages and salty snacks. This decrease in energy dense foods may have been the result of the inclusion of more fruit and dairy products on a daily and weekly basis.

The third hypothesis addressed problematic eating and meal time behaviors and the results of the Children’s Eating Behavior Inventory indicate that the 8-week intervention had a positive impact on eating and meal time behaviors in that the number and/or severity of problematic eating behaviors decreased following the 8-week intervention. Therefore, family meal style
service, active child participation, and modeling techniques during snack time have a positive impact on eating and meal time behaviors among children with developmental delays. As noted previously, the three children that had an increase in problematic eating behaviors all had a communication and personal/social delay. This may indicate that modeling, Family Style Meal Service, and child involvement during snack time may not be sufficient for this sub-group. Due to a communication and personal/social delay these children have a difficult time expressing to caregivers what they want, as well as establishing interpersonal relationships and articulating and regulating emotions. This sub-group would benefit from research regarding specific techniques for improving eating behaviors in children with communication and personal/social delays.

_strengths_

The Interdisciplinary Developmental Play Group Snack Time Intervention was very holistic in nature. Snack time was emphasized to be about more than nutrition, and was utilized as a time not only to work on dietary intake, but also work on speech and motor skills. Snack time required the children to assist in preparation and/or implementation of snack, which allowed the interdisciplinary team to assess and assist with fine motors skills including holding, gripping, spreading, squeezing, scooping, feeding oneself. Speech and communication were also highlighted during snack time, as children were required to request more of an item if desired, pass bowls of food to peers when requested, and encouraged to express their feelings associated with snack through developmentally appropriate words. Additionally, the intervention provided individualized care in a group setting. A 1-to-1 ratio, child/caregiver pair to graduate student (physical therapy, speech language pathology, or nutrition), was maintained at all times to ensure
children were receiving the appropriate attention and guidance. In addition to the graduate students, the play group was under constant supervision of clinicians, who provided additional assistance when needed.

Limitations

Several limitations are worth noting. Given the high specificity of the population, generalizability of findings may be limited. Additionally, due to this highly specific target population, the investigators were unable to obtain control group participants. The intent was to include control participants whom were receiving one-on-one therapy with a physical therapist, speech language pathologist, or occupational therapist, but were not involved in group therapy. Local therapists were provided with the questionnaires, as well as the consent forms, but none of their 1-on-1 clients were interested in participating in the study. Another potential limitation was that collected data was based on caregiver report, which may not accurately represent actual dietary intake and eating behaviors. Future studies would benefit from more objective assessment of food intake, and potentially an additional qualitative analysis component. The small sample size may also be viewed as a limitation; however, a maximum sample size was strategically determined based on the structure of the play group. The intervention resulted in a small sample size due to the importance of 1-on-1 attention and guidance provided by graduate students to the child/caregiver pairs. The maximum number of children that was deemed appropriate was 6 child/caregiver pairs in each play group. Other than the importance of the 1-on-1 attention, the small groups were also chosen to refrain from too much chaos in the Northern Illinois University Wellness Clinic. It was important not to highly
overwhelm the children who were new to the group setting. Finally, with a high participant
demand during the second session, a second play group was created, so there was a morning and
afternoon playgroup. In order to accommodate supervising clinicians and available space, the
afternoon session interfered with many children’s nap time, which resulted in tired, cranky, and
disengaged children.

Conclusions

In conclusion, Family Style Meal Service, child participation in snack time, and modeling
techniques are positively related to eating and meal time behaviors in young children
participating in play group therapy. That is, the majority of children scored lower on the
Children’s Eating Behavior Inventory post- intervention when compared to pre-intervention
scores. However, the 8-week intervention did not prove to have a significant positive impact on
dietary intake. Thus, the results of the present study cannot indicate that Family Style Meal
Service, child participation in snack time, and modeling techniques during a once-weekly play
group has an impact on dietary patterns and intake. Findings suggest that the social setting of the
play group and a family style meal may be important in establishing healthy habits, but are not
conclusive.

Toddlers and young children with developmental delays are at high risk for nutrient
insufficiencies based on picky and selective eating. Children of this age are at an important stage
for cognitive, emotional, and social development, and therefore these toddler and early childhood
years are an important time for interventions which assist children in meeting developmental
milestones. It is imperative that further research be conducted to determine the best approach for combating poor nutritional patterns and behaviors.

Future Research

For continuation of this intervention, alterations in study design are suggested to address the limitations and strengthen the results of the study. All play group sessions were recorded, and therefore analyzing the participant’s meal time experience on a weekly basis would provide important information regarding the impact of the play group. One study looked at children’s exploration, communication, and participation during snack time. Lantier (2012), implemented a snack time intervention for her Master’s thesis, which took place 8 times over a 16-day period and found and although was a very small sample size (n=4) showed an overall increase in these behaviors following the implementation of family style meal service when compared to serving children pre-portioned plates. Counting the number of times a child eats a food, tastes a food, touches a food, smells a food, or plays with a food could be used to measure exploration of new foods and willingness to try new foods. Eating behaviors and communication during snack time could be assessed through observing the number of times a child communicates with their caregiver, peer, or play group facilitator through eye contact, smiling, laughing, or talking, as well as the number of times a child asks for more of a food. To address involvement in mealtime the number of times a child serves him/herself, passes bowls or plates, and/or observes others exploring or eating new foods could be counted. Additionally, an increase in caregiver involvement should be established. Based on the weekly food logs collected during this intervention, it was apparent that caregivers were not implementing snack time strategies
discussed and applied in play group, or including more fruits and vegetables as the weeks progressed. Involvement would require the caregivers to be responsible for implementing changes established during the play group in the home. Increased interaction and communication with parents, as well as setting weekly nutrition goals in which the nutrition investigator checks in on the caregivers weekly appear to be integral to the success of this intervention. Additionally, based on the information that caregivers serve as models regarding dietary intake, it would be insightful to have food logs of the caregivers to determine if they are modeling healthful dietary intake in the home.
REFERENCES


APPENDIX A:

IRB APPLICATION AND APPROVAL FORM
Note: Please complete this form thoroughly keeping in mind that the primary concern is the potential risk (economic, ethical, legal, physical, political, psychological/emotional, social, breach of confidentiality, or other) to the participants. Provide copies of all materials to be used in the investigation. The Institutional Review Board (IRB) must have enough information about the transactions with the participants to evaluate the risks of participation.

Name(s) and employee ID for faculty, Z-ID for students
Christina Odeh, A1082847; Priyanka Chakraborty, A1759590, Danai Fannin A1662560, Joy Robackowski f40jfr1; Emily Mitchell, Z1750646

Status:  ☒ Faculty  ☒ Graduate Student  ☐ Undergraduate Student

Department:
Allied Health and Communicative Disorders; Family, Consumer and Nutrition Sciences

Mailing Address (if not department):

815-753-6247; 815-753-6346 815-753-1618 815-753-9126

Phone: codeh@niu.edu; pchakraborty@niu.edu jrobac@niu.edu dfannin@niu.edu Z1750646@students.niu.edu

E-mail

Project Title:
Interdisciplinary Parent/Toddler Developmental Play Group

Proposed Data Collection Start Date: October 2015

Note: Unless the authorized departmental reviewer (e.g., chair or designee) has deemed on the screening form that IRB review is not needed, all projects must receive formal written clearance from the IRB Chair (or an IRB member designated by the Chair) prior to the start of data collection.

Type of Project (Check one)
☒ Departmental Research (faculty/student projects not externally funded and not indicated below)

☐ Graduate Thesis/Dissertation (IRB application should be submitted AFTER proposal defense)
Advisor/Committee Chair (& e-mail):

☐ Undergraduate Project (Senior thesis/capstone, research rookies, independent study)
Advisor/Committee Chair (& e-mail):

☐ Externally Sponsored Research
A complete copy of the grant proposal or contract must accompany this application form for IRB review to take place.
• Source of Funding:
• Title of grant proposal (if different from IRB protocol):
• Name of principal investigator on grant proposal:
• Office of Sponsored Projects file number (Note: this is not the grant number): OSP#
Part I. Purpose and Procedures:

1) Describe the purpose of your study and the reason(s) this study is needed. Include any necessary background information and a description of your hypothesis or your research question.

An Interdisciplinary Parent/Toddler Play Group would expand our current clinical offerings and expose our Nutrition, Physical Therapy and Speech-Language Pathology Graduate Students to an Interdisciplinary Teamwork Model. In early intervention, federal mandate is that services be provided in the least restrictive environment with an emphasis on providing services in the child’s natural environment. For many years, one model of service provision in early intervention was parent-child groups. Providing services in a clinic environment is not considered a natural environment. Currently, in Illinois, playgroups are not reimbursed, and therefore not actively pursued. Typically, interventions are provided one on one in the home/natural environment. However, Interdisciplinary Teaming is considered best practice in the pediatric environment. There are no developmental play groups being offered in Dekalb County.

The Developmental Play Group would engage participants in structured activities to encourage age appropriate developmental milestones. The developmental domains we will address are: adaptive/self-care, communication, problem solving, motor and social-emotional developmental skills. Education and modeling regarding toddler nutrition, picky eater strategies, and healthy snack selection would be integrated into the developmental play group. It would also educate Parents and Caregivers on how to structure these developmental activities at home. Additionally, the Developmental Play Group would provide socialization and networking opportunities for local families who have children with disabilities. The group would be guided by an Occupational Therapist, Physical Therapist, Speech-Language Pathologists, Registered Dietitian Nutritionist, and a team of graduate students.

The Developmental Play Group will meet for 2 hours once per week for 9 weeks. All sessions will be video recorded with an overhead camera controlled from the observation room, and a handheld camera in the room when more detailed gathering of data is needed. Graduate student clinicians will provide individualized guidance and instruction to help each caregiver-toddler pair explore the group setting, with the assistance of supervising faculty. The environment will be structured with a variety of age appropriate, developmental activities. The children will be encouraged to engage in a number of play-based activities including a welcome circle with stories and songs, fine motor activities, sensory activities, snack time, gross motor activities, and closing circle with goodbye songs. Guidance will be provided as needed with the objective of facilitating development in the areas of concern identified during the intake screening. As children engage in activities, strategies will be discussed and demonstrated with caregivers during the session for implementation at home. During each session, adults and children will participate in both opportunities for free play and socialization as well as more structured and routine, age appropriate group activity.

The purpose of this study is to examine the effectiveness of a developmental play group from parent, child and practitioner perspective.

References:
2. Robackouski, J. (2014 Dec). Personal communication with CFC Regional Offices, Freeport and Sycamore, IL.

2) The following items will help the IRB reviewers understand the step-by-step procedures of your study:

2A) Explain the participant eligibility and exclusion criteria that will be used.
2B) Explain the recruitment procedures (how will participants learn about the study?). If using the snowballing technique, please explain who contacts potential participants (other participants or the researcher). Please attach recruitment scripts, flyers, or postings [Appendix A].

1) Investigators will distribute flyer via email to early intervention programs, colleagues and previous participants that have granted permission to be contacted regarding future research. E-mail, phone numbers and address will be provided on the flyers for parents to communicate with investigators in the most convenient method.

2) A flyer for recruitment will be posted in NIU's PT clinic, Speech and Hearing clinics, Campus child care center, child development lab and in the offices of the College of Health and Human Sciences and School of Allied Health and Communicative Disorders. 3) Other recruitment methods will include the snowball effect of participating families talking to other parents as well as word of mouth of colleagues, faculty and staff at NIU.

Investigators will be available to explain the study and answer questions on the phone or in person. Investigators will schedule an initial appointment to review the procedures, obtain informed consent and complete the initial data collection as outlined.

2C) Explain the consent process (verbal and/or written procedures for informing participants of the nature of the study and what they will do). Please attach all documents (assent, consent, parent permission – Appendix B) that are appropriate for each group of subjects participating in the study. Consent forms should be prepared for adult participants (age 18 or over). Assent forms should be prepared for minor subjects appropriate to their ages, and permission form(s) for parents or legally authorized representatives should also be prepared. For children too young to comprehend a simple explanation of participation, parental permission is sufficient only if the research will provide direct benefit to the subject, a member of the subject's family, or other children with the same condition as the subject.

If the parent(s) are interested in participating, informed consent will be emailed for review prior to the first appointment. At the first appointment with the parent, child and investigator, investigator will review the study description, purpose, procedures, benefits and risks. The investigator will also review the procedure for withdrawal by the parent(s) or by the investigators. If parent(s) agree to participate in the study, they will sign the informed consent form (see attached) and retain a copy for their records.

2D) Describe the data collection procedures including what data will be collected, how it will be collected (include a description of any interventions to be used), the duration of participation in the study session(s), and how the session(s) will end.
Group Informational Appointment:
(1) Parents will be given information regarding study procedures, and informed consent forms will be distributed.
(2) Ages and Stages Questionnaires – 3rd Edition will be provided as a developmental screener to determine eligibility. Parents will complete the screening form and consult with investigators on participant eligibility.
(3) Informed consent will be obtained for eligible participants.
(4) Parents of eligible participants will be instructed on how to complete the following questionnaires at home: Children's Eating and Mealtime Behavior Inventory, Vineland Behavior Scales and MacArthur Bates Communication Inventory. These questionnaires will be returned by the parent/caregiver at the intake session.

Individual Intake Sessions:
(5) Parent(s) will complete a demographic questionnaire and Harvard Food Frequency Questionnaire.
(6) The investigator will measure the child’s height while they are lying on their back with a tape measure. The child’s weight will be measured by standing on a digital scale. Both height and weight will be recorded onto the demographic questionnaire.
(7) If determined necessary by the ASQ-3, the investigators will conduct standardized developmental assessment(s) at this appointment. Investigators will determine most appropriate tool based on individual needs: Peabody Developmental Motor Scales, 2nd Ed. (PDMS-2), Rosetti Infant Toddler Scale, Brigance Infant/Toddler Curriculum Assessment, and Batelle Developmental Inventory - 2nd Edition (BDI-2), the Early Social-Communication Scales (ESCS), and the Structured Play Assessment. The standardized assessments take approximately 90 minutes to administer and requires participation of the child and parent in standardized developmental tasks to assess abilities. The scoring booklets will be collected by the investigators. The data will be recorded and verified in the SPSS dataset. The dataset and booklets will only be accessible by investigators.
(8) The investigator will collect the questionnaires completed by the parent(s) of the participating children. The information will be also recorded and verified in an SPSS dataset. The SPSS dataset will only be accessible by investigators, and will be stored on an encrypted hard drive.

Intervention:
(9) The investigators will facilitate the weekly developmental play group for 2 hours per week for a total of 9 weeks. See description of intervention above (1).
(10) Parent(s) will complete a weekly log of food intake. This log will be collected by the investigators at the start of the developmental play group each week.
(11) At the last session of the 8-week intervention, parents will complete the Measure of Processes of Care – 20.

Individual Discharge Session:
(12) Investigators will re-administer the developmental assessments completed prior to intervention.

Group Student and Investigator Debriefing
(13) Investigators and students participating in the intervention sessions will complete an MPOC-SP.

(14) The investigator will transcribe results of the developmental assessments, MPOC-20 and MPOC-SP into an electronic database, which will be de-identified with a unique alphanumeric code for each participant. All electronic data will be stored on an encrypted hard drive. The demographic survey, ASQ-3 questionnaire, and participation logs will be kept in a locked file cabinet separate from the locked file cabinet with the key for the alphanumeric codes. Investigator will be the only individual with a key to unlock the file cabinets in her locked office.

Time commitment for the study will involve the group informational session, intake session, intervention and discharge session. The group informational session should take no more than 60 minutes. Intake sessions may take up to 90 minutes, depending on individual needs for standardized assessments.
Intervention is 18 hours of participation in a facilitated developmental play group. Discharge session may take up to 90 minutes, depending on individual needs.

Please note: It is the researcher’s responsibility to seek out permission to use copyrighted materials. Please indicate whether you have permission to use any copyrighted materials for your project:

☐ Yes, I have permission to use any copyrighted materials for this project
☐ No, I do not yet have permission to use any copyrighted materials for this project
☒ This is not relevant for the materials being used in this project

2F) If applicable, explain the procedures for providing compensation.

N/A

2F) If applicable, explain the procedures for debriefing participants. Please attach a debriefing script or sheet [Appendix D]

N/A

Reminder: As appendices to this application, attach copies of all: A) Recruitment information [script/flyer/etc.], B) Informed consent documents [assent/parent permission/scripts/etc.], C) Materials [questionnaires/surveys/interview questions/list of all information/data to be collected/etc.], D) Debriefing information [documents/scripts], E) Referral list [if appropriate]. It is the responsibility of the researcher to obtain any relevant permission for copyrighted materials. If the research involves an oral interview or focus group discussion that could evolve as it progresses, include a list of discussion topics and any “starter” questions for each topic that can reasonably be expected to be covered. If a draft of a written questionnaire or survey is attached, it should be clearly labeled as such and a final version must be submitted before data collection begins. PLEASE NOTE THAT ANY ITEMS CAN BE ATTACHED AS SEPARATE DOCUMENTS IF NEEDED.

Part II: Research Participants

3) Participant demographics:

• Gender: ☒ M ☐ F ☐ Both ☒
• Estimated age(s):

  All participants will be in the range of 18 months and 3 years old.

• Are any subjects under age 18? ☒ Yes ☐ No

• Potentially vulnerable populations (please indicate if any of the following groups are the target population of the study)
  ☐ Pregnant women & fetuses
  ☐ Prisoners
  ☐ Decisionally impaired/mentally disabled
  ☐ Specific ethnic group(s) (list in box):

  N/A

If any potentially “vulnerable populations” have been indicated above, please explain the necessity for using this particular group, or if specific groups are excluded from the study, please indicate the exclusion criteria used.

N/A

• Target number of participants in the entire study (including controls) from start to finish (keep in mind that this is just an estimate of the total):

  16-20

4) Please explain any outside institutional (i.e., schools, hospitals) approval you will need to obtain and how approval will be sought. Provide scripts, letters, or emails providing any information that will be used to obtain needed approvals/permission. It is the responsibility of the researcher to follow all applicable policies of any outside institution(s).
Part III: Risk/Benefit assessment

5) What knowledge/benefit(s) to the field will be gained from the study?
By investigating, we begin to determine the benefits of exposure to interdisciplinary teaming, impact of group therapy model on child outcomes and parent satisfaction.

6) What direct benefit(s) are there to the participant(s) (if any) from the proposed research? [For example, learning a new skill, psychological insight, teaching experience] [Please note that compensation is NOT considered a direct benefit.]
The potential benefits include identification of developmental delay and assistance with referral to the appropriate specialist for a full evaluation, if needed. Individualized programming for improved developmental skills. Parent/child socialization and networking.

7) Describe any potential risks (breach of confidentiality, economic, ethical, legal, physical, political, psychological/emotional, social, or other) to the subjects posed by the proposed research. (Note: Some studies may have “no reasonably foreseeable risks.”) Investigators are required to report all unexpected and/or adverse events to the IRB. Therefore, it is important that you list all reasonably anticipated risks because unanticipated adverse events may need to be reported by NIU to OHRP.
Developmental assessments and developmental play group run the potential risk for injury. This risk is no more than a typical day. Although, the child’s risk for injury is minimal and the same as typical play-based activities, Christina Odeh, Danai Fannin, and Priyanka Chakraborty, investigators, are experts in working with children and will ensure the activities are performed safely with minimal risk.

8) Federal regulations require that researchers use procedures that minimize any risks to participants. What procedures will be used to minimize each risk and/or deal with the challenge(s) stated in “7” above?
Investigators are pediatric specialists. They will lead the assessments in their area of expertise; we minimize the risk for harm by performing developmentally appropriate activities in an environment with the appropriate amount of space for the activity. Also, the investigators will ensure the parent(s) are aware that their participation in the study will in no way negatively reflect or impact their relationship with NIU or the early intervention program.

9) If support services are required to minimize risk of harm to participants, explain what will be provided (list of services available – Appendix E). [A resource list for the DeKalb area is available on the ORC website – if using this, please provide a copy with your application.]
If needed, or requested, the parents will be provided with a list of Developmental Pediatric Specialists who practice in the state of Illinois.

10) How do the potential benefits of the study justify the potential risks to the participants?
As stated above, by investigating, we begin to determine the benefits of exposure to interdisciplinary teaming, impact of group therapy model on child outcomes and parent satisfaction.

Part IV: Consent Document Variations

11) Will audio, video, or film recording be used? Yes ☒ No ☐
If yes, specify the recording format to be used.
Videotaping of assessments and play group sessions will be conducted. Videos will be made with a digital camera, video with the overhead camera installed in all treatment rooms at the clinic, and stored on DVDs and a lab computer.
Please keep in mind that specific consent must be sought in the informed consent document(s) by including a separate signature/date line giving consent for recording. This is in addition to the signature/date line giving consent to participate in the research project.
12) Will this project require the use of consent/assent documents written in a language other than English?  
Yes ☐ No ☒  

Reminder: If non-English documents will be used, please have the document translator **provide documentation** (email or written) that the translation is equivalent to the English version. *[This can be done after the protocol is approved in order to minimize the number of changes needed.]*

13) Are you requesting a **waiver of a signed** informed consent document?  
Yes ☐ No ☒  

Please indicate the justification for requesting this waiver:

☐ The only record linking the subject to the research would be the signed consent document and the principal risk of the research would be breach of confidentiality.

☐ The research involves minimal risk to the subjects and involves no procedures for which written consent is normally required outside of the research context (e.g., online surveys).

14) Are you requesting a **waiver/alteration** of some other aspect of the informed consent document?  
[This section is relevant for studies involving deception.]  
Yes ☐ No ☒  

14a) Please explain which aspects of informed consent will be missing or altered along with a justification for the change.  
N/A

14b) Please explain how the project meets all of the following criteria:

1) The research presents no more than minimal risk of harm to the participants.  
N/A

2) The waiver/alteration will not adversely affect the rights or welfare of the participants.  
N/A

3) The research could not practicably be carried out without the waiver or alteration.  
N/A

4) Whenever appropriate, the participants will be provided with additional pertinent information after participation.  
N/A

15) Will any HIPAA protected health information be collected as part of the data?  
Yes ☐ No ☒  

If yes, describe the procedures for protecting the information.  
N/A  
*[Please provide a copy of your HIPAA disclosure form to be given to participants.]*

16) Will any protected school records be collected as part of the data?  
Yes ☐ No ☒  

If yes, describe the procedures for protecting the information.
Part V: Confidentiality and Anonymity

17) Will identifying information be connected to the data (even through an identification key linking identities to a pseudonym or code that is kept separate from the data)? Yes ☑ (confidential data) No ☐ (anonymous data)

18) If you answered yes to the above question, describe precautions to insure the privacy of the subjects, and the confidentiality of the data, both in your possession and in reports and publications.

We will utilize de-identification procedures by assigning a unique 10-digit alphanumeric code to each child at their intake appointment. The randomly assigned code will be used in place of the child's name on the questionnaires and logs as well as when entering the research data into SPSS or the password protected excel spreadsheets. The key will be kept as an encrypted file separate from the data, and a printed copy of the key will be kept in a locked file cabinet in the investigator’s locked office. No personally identifiable information will be reported in publication.

19) How will the records (data, recordings, and consent forms) be stored? Also indicate how long records will be kept and how and when they will be disposed of.

[Note: Signed informed consent documents must be maintained for 3 years following completion of the study.]

A separate locked file cabinet in a locked office will house any personally identifiable information collected during the study. The electronic data will be kept on an encrypted hard drive. While in transit, any forms in the possession of the co-investigator will be kept in a portable locking tote. DVDs will not be destroyed but stored confidentially. All data will be stored in a locked office where only the faculty investigator, graduate clinicians, and clinic director have keys. Videos will be made with a digital camera, video with the overhead camera installed in all treatment rooms at the clinic, and stored on DVDs and a lab computer.

Part VI: Does this project involving deception

Yes ☑

[complete this section only if your study includes deception]

20) Describe the deception being used. Be sure to clarify whether this is deception by omission (an important aspect of the study is withheld from the participants) or commission (the participant is misled about some aspect of the study) or both. [Complete item 14 if aspects of consent are missing.]

N/A

21) Why is deception a necessary and unavoidable component of the experimental design?

N/A

22) Debriefing of participants will be:

☐ Immediate (directly following the research session)

☐ Delayed

☐ Full (all aspects of deception will be revealed)

☐ Partial (some aspects of deception will remain unexplained)

a) If debriefing is delayed, why is the delay necessary, and when will it occur?

N/A
b) If debriefing is partial, why is the partial debriefing necessary? Would the participant be harmed in any way by full debriefing?

N/A

c) If debriefing is partial, will full debriefing occur later?

N/A

d) Does the presence of deception increase risk of harm to the participants?

N/A

e) Is the respondent free to withdraw his/her data after being fully debriefed?

N/A

23) Who will provide the debriefing?

N/A

Reminder: Please include a copy of your debriefing script/sheet with this application [Appendix D].

Part VII: Credit and Compensation
24) If participants will receive course credit for participation, please describe it below.

N/A

25) If participants will receive some other form of compensation for participation, please describe it below.

N/A

26) Describe any alternative tasks that will be available for participants to earn the credit or compensation.

N/A

Part VIII: Conflict of interest
27) Do any of the researchers conducting this study have any potential conflicts of interest?

[Conflicts of interest may include financial or personal interest, or any condition in which the investigator’s judgment regarding a primary interest may be biased by a secondary interest.]

Yes ☐ No ☒

28) If yes to the above question, please describe the nature of the conflict of interest.

Please use the following link to access the NIU research conflict of interest policy:

Part IX: Researcher Qualifications
29) In addition to listing the investigators’ names, indicate their qualifications to conduct procedures to be used in this study (specifically describe past experience conducting research with humans or how training will occur).
Principal investigator: Christina Odeh is an Assistant Professor in the School of Allied Health and Communicative Disorders. She completed her Doctorate of Health Science degree in physical therapy from the University of Indianapolis in August of 2014. The research conducted by Christina Odeh was similar in content and context to this study. It required recruitment of children 3-5 years old and assessment of their physical activity with accelerometers as well as screening of developmental skills with a questionnaire. The project was successfully completed and subsequently defended on July 18, 2014. She is currently engaged in two other research projects involving children at NIU. She has 21 years experience working with children and has run developmental play groups in the past.

Co Investigator: Priyanka Chakraborty, is an Assistant Professor and Registered Dietitian in the School of Family, Consumer and Nutrition Sciences. She has extensive experience working with children in community settings. As a doctoral student at the University of Georgia, she assisted in data collection and analysis for three population based research projects, specifically with pregnant women and infants. She also has international experience of working with underserved rural population in India.

Joy Robackouski is Clinic Director for the Physical Therapy and Speech and Hearing Clinics at NIU. Her role will be administrative with the following duties: recruitment, purchasing equipment, enrollment, allocation of clinic space and maintaining HIPAA compliance documents.

Danai Fannin, PhD-CCC-SLP is an assistant professor in Allied Health and Communicative Disorders and a licensed Speech-Language Pathologist. Dr. Fannin was a postdoctoral fellow at UCLA where she worked on autism treatment clinical trials for infants and toddlers.

30) State the date of completion of CITI Human Subjects Protection training program(s) for the individuals listed in the above question. [Note: NIU Policy requires that research investigators must complete appropriate training before conducting human subjects research.] If you have comparable training, please attach certification indicating this.

CITI (Collaborative Institutional Training Initiative) training is thorough and well recognized: https://www.citiprogram.org/Default.asp?

Christina Odeh completed CITI human protections training successfully completed on 04/10/2012. A refresher course was completed successfully on 01/12/2014.


Co-Investigators Joy Robackouski and Sarah O'Connor completed CITI training on 06/19/15.

Emily Mitchell completed her CITI human protections training on 09/29/204. In addition, all other students that may be involved with the study will complete CITI training completion dates will be forwarded to IRB.
REQUIRED SIGNATURES: ALL PROJECTS

10/20/2016

NORTHERN ILLINOIS UNIVERSITY
Office of Research Compliance and Integrity

Approval Notice
Initial Review

31-Aug-2015

TO: Christina Oddh
Affiliated Health and Communicative Disorders

RE: Protocol # 1815-1042 “Interdisciplinary Parent/Indian Developmental Play Group”

Your Initial Review submission was reviewed and approved under Expedited procedures by Institutional Review Board #2 on 31-Aug-2015. Please note the following information about your approved research protocol:


If your project will continue beyond this date, or if you intend to make modifications to the study, you will need additional approval and should contact the Office of Research Compliance and Integrity for assistance. Continuing review of the project, conducted at least annually, will be necessary until you no longer collect any identifiers that could link the subjects to the data collected. Please remember to use your protocol number (1815-1042) on any documents or correspondence with the IRB concerning your research protocol.

Please note that the IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or mandate the conduct of your research and the consent process. Unless you have been approved for a waiver of the written signature of informed consent, this notice includes a date-stamped copy of the approved consent form for your use. NU policy requires that informed consent documents given to subjects participating in non-exempt research bear the approval stamp of the NU IRB. This stamped document is the only consent form that may be photocopied for distribution to study participants.

It is important for you to note that as a research investigator involved with human subjects, you are responsible for ensuring that this project has current IRB approval at all times, and for obtaining the signed consent forms obtained from your subjects for a minimum of three years after the study is concluded. If consent for the study is being given by proxy (guardian, etc.), it is your responsibility to document the authority of that person to consent for the subject. Also, the committee recommends that you include an acknowledgment by the subject, or the subject’s representative, that he or she has received a copy of the consent form. In addition, you are required to promptly report to the IRB any injuries or other unanticipated problems or risks to subjects and others. The IRB extends best wishes for success in your research endeavors.
APPENDIX B:

RECRUITMENT FLYER
What Is Involved?

- **Initial Assessment:** We will ask you to complete some questionnaires, participate in an interview, and one developmental assessment session and nutritional screening.

- **Intervention Program:** You and your child will participate in a 9-week parent/toddler playgroup facilitated by a Physical Therapist, Occupational Therapist, Speech-Language Pathologist, Audiologist, and Registered Dietitian Nutritionist. The intervention is a weekly, 2-hour playgroup to address Motor, Communication, Problem Solving, Personal and Social developmental skills at the NIU Family, Health, Wellness and Literacy Center.

- **Follow Up Assessment:** You will participate in a developmental assessment session at the end of the 9-week intervention, and again six months later.

What Kind of Intervention Is Offered?

Children with developmental delays often have difficulty playing with parents and peers. Successful play interactions provide many opportunities for your child to learn about communication, social relationships, and fine and gross motor skills. Through play-based intervention, we will be able to observe your child’s behavior and discover ways to make your play interactions more successful and enjoyable.

Benefits to Participants:

- Free developmental assessments and individualized consultation from pediatric specialists
- Nutritional screening and consultation
- Opportunity to network with other parents and healthcare providers
- Free 9-week intervention

Who Can Participate?

- You may be eligible for this study if your child is between the ages of 18 months and 3 years old and you have a concern regarding a delay in any area of development.

How Can I Get Involved?

- If you would like to learn more about this study, contact Dr. Christina Odeh at 815-753-6247

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**Christina Odeh, PT, DHSc, PCS**
Principal Investigator & Clinical Supervisor
NIU Interdisciplinary Parent/Toddler Developmental Play Group Study

Dr. Odeh is a faculty member in the NIU School of Allied Health & Communicative Disorders. Her research, as well as other faculty on the study focuses on the physical, communication, and life skills of typically developing children, as well as those with developmental delays.

Wirtz Hall 209E, DeKalb, IL 60115
Phone: 815-753-6247
Mobile: 630-557-9648
Fax: 630-445-4034
Email: codeh@niu.edu
APPENDIX C:

PARTICIPANT INFORMED CONSENT FORM
Principal Investigator: Christina Odeh, PT, DHSc, PCS, Assistant Professor
School/Department/Division: Northern Illinois University/College of Health and Human Services/Allied Health and Communicative Disorders
Telephone: 815-753-6247

PARENT INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES
Interdisciplinary Parent/Toddler Developmental Play Group

1. PURPOSE OF THIS RESEARCH STUDY
The purpose of this study is to examine the effectiveness of a developmental play group from parent, child and practitioner perspective.

I have been asked to participate in this research study because my child is between the ages of 18 months and 3 years. I have been informed that my child will be one of up to 8 children participating in this play group.

2. WHAT WILL BE DONE / PROCEDURES
I have been informed of the following procedures:
We will participate in an Individual Intake Session. At this session, I will complete a demographic questionnaire and Harvard Food Frequency Questionnaire. The investigator will measure the child’s height while they are lying on their back with a tape measure. The child’s weight will be measured by standing on a digital scale. Both height and weight will be recorded onto the demographic questionnaire. If determined necessary by the Ages and Stages Questionnaire (ASQ-3), the investigators will use some standardized tests to determine what your child’s needs are. There are several tests which may be used, and the investigators will determine which tests are most appropriate for your child. The tests involve: Peabody Developmental Motor Scales, 2nd Edition (PDMS-2), Rosetti Infant Toddler Scale, Brigance Infant/Toddler Curriculum Assessment, and Batelle Developmental Inventory - 2nd Edition (BDI-2), Early Social-Communication Scales (ESCS), and the Structured Play Assessment. The standardized assessments take approximately 90 minutes to administer and requires participation of my child in standardized developmental tasks to assess abilities.

I have been informed that while my child is in this study, he/she will participate in an interdisciplinary play group that may be facilitated by NIU Speech and Language Pathology, Physical Therapy and Nutrition Faculty and/or students as well as an Occupational Therapist and Audiologist. This developmental play group will consist of nine weeks of a weekly 2 hour structured play group with infants/toddlers and their parent(s). I have been informed that I will need to complete a weekly food log of my child’s food and drinks and the investigators will explain how to record my child’s diet. This should take about 15-20 minutes/day. This log will be collected by the investigators at the start of the developmental play group each week. At the last session of the 9-week intervention, I will complete the Measure of Processes of Care – 20, a questionnaire regarding my satisfaction with the services provided.
The following week, we will participate in a discharge session in which investigators will re-administer the developmental assessments completed prior to intervention. I have been informed that I may receive a verbal explanation or a written report of the developmental assessments completed.

I have been informed that the intake session, developmental assessments and participation within the developmental play group will be videotaped. Time commitment for the study will involve the group informational session, intake session, intervention and discharge session. The group informational session should take no more than 60 minutes. Intake sessions may take up to 90 minutes, depending on individual needs for standardized assessments. Intervention is 18 hours of participation in a facilitated developmental play group. Discharge session may take up to 90 minutes, depending on individual needs.

3. POSSIBLE BENEFITS
My child’s participation in this research may not benefit him/her or his/her health. Potential benefits include identification of developmental delay and assistance with referral to the appropriate specialist for a full evaluation, if needed. My child will receive individualized programming to improve developmental skills. The participants also have the opportunity for parent/child socialization and networking. By investigating, we begin to determine the benefits of exposure to interdisciplinary teaming and the impact of a group therapy model on child outcomes and parent satisfaction. This can lead to additional research on the impact of developmental play groups on development and later preschool performance.

4. POSSIBLE RISKS AND DISCOMFORTS
Developmental assessments and developmental play group run the potential risk for injury. This risk is no more than a typical day. Although, the child’s risk for injury is minimal and the same as typical play-based activities, Christina Odeh, Danai Fannin, and Priyanka Chakraborty, investigators, are experts in working with children and will ensure the activities are safely with minimal risk. There is also a potential risk via breach of confidentiality; all research material will have a unique participant code and will be kept in a locked file cabinet separate from the key.

5. CONFIDENTIALITY OF RECORDS
I have been informed that any personal information from this study, in which I might be identified, will remain confidential and stored in a locked filing cabinet separate from other research data. All records will be stored in locked file cabinets in a locked room. All electronic data will be stored on password and/or encryption protected devices. Only the investigator and members of the research team will have access to these records. If information learned from this study is published, I will not be identified by name. We will utilize de-identification procedures by assigning a unique alphanumeric code to each participant when their first appointment is set. All data and forms, including demographic information and interviews, will be printed and labeled with the randomly assigned alphanumeric code rather than participant’s name. While in transit, any forms in the possession of the co-investigator will be kept in a portable locking tote.

APPROVED
AUG 31 2015
BY NJU/ILB
VOID ONE YEAR
FROM ABOVE DATE
6. OFFER TO ANSWER QUESTIONS
I have been informed that if I have any further questions, I can contact Dr. Joy Robackouski at 815-753-1618, jrobac@niu.edu or Dr. Christina Odeh at (815) 753-6247, codeh@niu.edu. I have been informed that I will receive a copy of this informed consent document for my records. I understand that if I have questions about my rights as a research participant, I may contact the NIU Office of Research Compliance at (815) 753-8588.

I have been informed that a copy of the final research results will be made available to me at the conclusion of the study by contacting Dr. Christina Odeh at (815) 753-6247 or at codeh@niu.edu.

7. VOLUNTARY PARTICIPATION WITH RIGHT OF REFUSAL
I have been informed that my participation in this research study is voluntary. If I choose not to participate in this study, it will not affect my relationship with the preschool, or the university in any way. I am free to withdraw from this study at any time without penalty. If I choose to withdraw prior to the first appointment completion, I will notify Dr. Joy Robackouski at 815-753-1618, jrobac@niu.edu or Dr. Christina Odeh at (815) 753-6247, (630) 557-9648, codeh@niu.edu.

8. SIGNATURE FOR CONSENT
The above-named investigator has informed me of the risks and benefits of participating in this research project. I have asked questions and I have received answers that help me better understand the risks and benefits. I have thought about the risks and benefits, and I consent to be a research participant in this study.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

__________________________
Name of Subject

__________________________
Name of Legal Guardian (if applicable)

__________________________ Date
Signature of Subject or Legal Guardian

INFORMATION ABOUT THE RESULTS OF THE STUDY
Please indicate by checking and placing your initials next to the category below concerning the type of information you want to receive. It is your responsibility to let the investigator know if your address or telephone number changes. The contact information is in this informed consent form under "Identification of Investigators".

__________________________ General information about what the study found

[Stamp: APPROVED
AUG 8 1 2015
BY NIU I.R.B.
VOID ONE YEAR
FROM ABOVE DATE]
Specific information about what the study found about my child
I do not want any information

I give permission for my child and I to be videotaped during the Individual Intake Session and during the Developmental Play Group sessions.

Signature of Subject / Legal Guardian ___________________________ Date __________

You have the right to refuse to have the videos used for educational purposes.

I agree to have videos of my participation in the DPG used for educational purposes.
I do not want videos of my participation in the DPG used for educational purposes.

Signature of Subject or Legal Guardian ___________________________ Date __________

Participation in Future Research Studies
Could we contact you in the future to ask you to participate in follow-up or associated research projects by mail or by phone? (Circle your response)

By mail? YES NO
By phone? YES NO

SIGNATURE OF INVESTIGATOR

In my judgment the subject is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

Signature of Investigator ___________________________ Date __________
APPENDIX D:

STUDENT/INVESTIGATOR INFORMED CONSENT FORM
Principal Investigator: Christina Odeh, PT, DHSc, PCS, Assistant Professor  
School/Department/Division: Northern Illinois University/College of Health Services/Allied Health and Communicative Disorders  
Telephone: 815-753-6247

STUDENT/INVESTIGATOR INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES  
Interdisciplinary Parent/Toddler Developmental Play Group

1. PURPOSE OF THIS RESEARCH STUDY  
The purpose of this study is to examine the effectiveness of a developmental play group from parent, child and practitioner perspective.

I have been asked to participate in this research study because I will be participating in the interdisciplinary developmental play group. I have been informed that graduate students and faculty in the following departments may also be collaborating: Nutrition, Communicative Disorders, and Physical Therapy.

2. WHAT WILL BE DONE / PROCEDURES  
I have been informed that I will assist by facilitating parent/toddler participation in an Interdisciplinary Developmental Play group (DPG) for 8 weeks. At the end of the developmental play group, I will complete a questionnaire: Measure of Processes of Care – Service Provider. This is a 27 item self-assessment questionnaire for pediatric service providers. It is designed to measure implementation of family-centered service in caring for children with chronic health or development problems (and their families). It is a discriminative tool that is expected to contribute to initiatives of professional development, program evaluation, and research in the field of health service delivery. I have been informed that this questionnaire may take up to 30 minutes to complete.

3. POSSIBLE BENEFITS  
My participation in this research may benefit my professional development with exposure to interdisciplinary teaming as well as beginning to determine the impact of group therapy model on child outcomes and parent satisfaction. This can lead to additional research on the impact of developmental play groups on development and later preschool performance.

4. POSSIBLE RISKS AND DISCOMFORTS  
There are no risks that have been identified.

5. CONFIDENTIALITY OF RECORDS  
I have been informed that any personal information from this study, in which I might be identified, will remain confidential and stored in a locked filing cabinet separate from other research data. All records will be stored in locked file cabinets in a locked room. All electronic data will be stored on password and/or encryption protected devices. Only the investigator and members of the research team will have access to these records. If information learned from this study is published, I will not be identified by name. We will utilize de-identification procedures by assigning a unique alphanumeric code to each participant when their first appointment is set. All data and forms, including demographic information and interviews, will
be printed and labeled with the randomly assigned alphanumeric code rather than participant’s name. While in transit, any forms in the possession of the co-investigator will be kept in a portable locking tote.

6. **OFFER TO ANSWER QUESTIONS**
   I have been informed that I will receive a copy of this informed consent document for my records. I understand that if I have questions about my rights as a research participant, I may contact the NIU Office of Research Compliance at (815) 753-8588.

7. **VOLUNTARY PARTICIPATION WITH RIGHT OF REFUSAL**
   I have been informed that my participation in this research study is voluntary. If I choose not to participate in this study, it will not affect my relationship with the university in any way. I am free to withdraw from this study at any time without penalty. If I choose to withdraw prior to the first appointment completion, I will notify Dr. Joy Robakowski at 815-753-1618, jrobac@niu.edu or Dr. Christina Odeh at (815) 753-6247, (630) 557-9648, codeh@niu.edu.

**SIGNATURE FOR CONSENT**
The above-named investigator has informed me of the risks and benefits of participating in this research project. I have asked questions and I have received answers that help me better understand the risks and benefits. I have thought about the risks and benefits, and I consent to be a research participant in this study.

________________________  __________________________
Signature of Student or Investigator  Date

**You have the right to refuse to have the videos used for research purposes.**

_______ I agree to have videos of my participation in the DPG used for research purposes.

_______ I do not want videos of my participation in the DPG used for research purposes.

_______ I agree to have videos of my participation in the DPG used for educational purposes.

_______ I do not want videos of my participation in the DPG used for educational purposes.

________________________  __________________________
Signature of Student or Investigator  Date

**SIGNATURE OF INVESTIGATOR**
In my judgment the subject is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

________________________  __________________________
Signature of Investigator  Date

**APPROVED**

AUG 31 2015
BY NIU IRB
VOID ONE YEAR
FROM ABOVE DATE
APPENDIX E:

GENERAL CHILD HARVARD STUDY FOOD FREQUENCY QUESTIONNAIRE
Children’s Nutrition Questionnaire

What Have You Been Eating Lately?

“During the past 4 weeks, how often did you eat a serving of each of the foods listed here?”
Mark only one X for each food

Example:

<table>
<thead>
<tr>
<th>Food</th>
<th>last 4 weeks</th>
<th>each week</th>
<th>each day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot chocolate</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What kind of milk does your child usually drink? (Check one)
1. [ ] breastmilk  3. [ ] whole  5. [ ] 1%  7. [ ] Chocolate Milk
2. [ ] formula  4. [ ] 2%  6. [ ] skim  8. [ ] other

Continued on next page
Mark only one X for each food.
How often did you eat a serving of these foods during the past 4 weeks?

<table>
<thead>
<tr>
<th>Food</th>
<th>last 4 weeks</th>
<th>each week</th>
<th>each day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of times</td>
<td>0</td>
<td>1-3</td>
</tr>
<tr>
<td>Corn</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Peas</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tomatoes, tomato sauce, salsa</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Peppers (green, red or hot)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Carrots</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Broccoli</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Green beans</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Spinach</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Greens (mustard, turnip, kale)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mixed vegetables</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Squash, orange or winter</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Zucchini, yellow squash</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>French fries, fried potatoes, tater tots</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Potatoes (baked, boiled, or mashed)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sweet potatoes or yams</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cabbage, coleslaw or cauliflower</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Lettuce salad</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Salad dressing</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Chips (potato, corn or others)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Popcorn or pretzels</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Crackers</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Nuts</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cookies or brownies</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cake or cupcake</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Pie</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Jello</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Chocolate or candy bar</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other candy (not chocolate)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Coffee or tea</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Soda, soft drink, pop (not sugar free)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Soda, soft drink, pop (sugar free)</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Food</td>
<td>last 4 weeks</td>
<td>each week</td>
<td>each day</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>Number of times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans (baked, chili, or other)</td>
<td>0</td>
<td>1</td>
<td>2-4</td>
</tr>
<tr>
<td>Rice</td>
<td>1</td>
<td>2-3</td>
<td>5-6</td>
</tr>
<tr>
<td>Spaghetti or other pasta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tacos, burritos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macaroni and cheese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot dogs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sausage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamburger (prepared any way)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canned tuna</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fried fish, fish sticks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other fish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold cuts (baloney, ham, salami)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fried chicken, chicken nuggets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other chicken or turkey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pork or ham</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roast beef or steak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver, organ meats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peanut butter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bread (slice) toast, roll, or pita</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butter (not margarine)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margarine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Food</th>
<th>last 4 weeks</th>
<th>each week</th>
<th>each day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable soup</td>
<td>0</td>
<td>1</td>
<td>2-4</td>
</tr>
<tr>
<td>Other soup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cornbread or tortilla</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot cereal, grits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold cereal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donut</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet roll or muffin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pancake, waffle, or french toast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English muffin or bagel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biscuit</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
APPENDIX F:

CHILDREN’S EATING BEHAVIOR INVENTORY
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child chews food as expected for his/her age</td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>2. My child helps to set the table</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. My child watches TV at meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I fixed my child if he/she doesn't eat</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. My child takes more than half an hour to eat his/her meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Relatives complain about my child's eating</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. My child enjoys eating</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. My child asks for food which he/she shouldn't have</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. My child feeds him/her self as expected for his/her age</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. My child rag at mealtimes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I feel confident my child eats enough</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I find our meals stressful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. My child vomits at mealtimes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. My child takes food between meals without asking</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. My child comes to the table 1 or 2 minutes after I call</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. My child chokes at mealtimes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. My child eats quickly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. My child makes foods for him/her self when not allowed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. I get upset when my child doesn't eat</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. At home my child eats food he/she shouldn't have</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. My child eats foods that taste different</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. I let my child have snacks between meals if he/she doesn't eat at meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. My child uses cutlery as expected for his/her age</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. My child eats food he/she shouldn't eat</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25. My child asks for food between meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26. I get upset when I think about our meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27. My child eats chunky foods</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28. My child eats food in his/her mouth</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29. At dinner I let my child choose the foods he/she wants from what is served</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

If you are a single parent skip to number 34

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30. My child's behavior at meals upset my spouse</td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>31. I agree with my spouse about how much our child should eat</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32. My child interrupts conversations with my spouse at meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>33. I get upset with my spouse at meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34. My child eats when upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>35. My child says he/she is hungry</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>36. My child says he/she'll get fat if she/he eats too much</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>37. My child helps to clear the table</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>38. My child hides food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39. My child brings toys or books to the table</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

If you have only one child skip number 40

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40. My child's behavior at meals upset our other children</td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

Please check to see that you have answered all the items.

Have you circled a yes or no for each item? Thank you.

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APPENDIX G:

WEEKLY FOOD LOG AND PORTION GUIDE
Weekly Food log

Participant’s ID # ______________________

Please be as specific and accurate as possible as you record what your child eats and drinks throughout the day. Include information on the food and drink item, description of item as applicable and quantity/serving size. A portion size guide and sample food log is also provided for your convenience. Thank you.

<table>
<thead>
<tr>
<th>Meal information</th>
<th>Meal location e.g. at home, at day care, etc.</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afternoon and/or evening snack</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Estimation of Portion Sizes

3 oz (75 g) cooked chicken or meat (4 oz raw) – deck of cards
about 3-4 oz meat – palm of your hand
1 cup (250 ml) cooked rice, pasta, or ice cream – tennis ball

medium piece of fruit – baseball
1 tsp (5 ml) butter or margarine – one die
1 tsp – knuckle to tip of thumb

1 cup (250 ml) – average woman’s fist
1/2 cup – small handful
2 tbsp (30 ml) peanut butter, jam, salad dressing – golf ball
1 small baked potato – a computer mouse

1 oz (30 g) of chocolate – a packet of dental floss
1 oz (30 g) cheese – 4 dice or 1 domino
APPENDIX H:
PHOTOS AND DESCRIPTION OF SNACK TIME
Layout of the Snack Time
During Snack time, children and their caregivers sat around the horseshoe table on chairs. The primary nutrition investigator sat at the center of the horseshoe to demonstrate snack preparation and model eating behaviors. Physical Therapy and Speech-Language Pathology Graduate students were dispersed throughout the room to promote appropriate motor skills and speech/communication.

Place Setting
Children who were able, were asked to assist with table setting. This included their placemat, bowl, plate, fork, spoon, and cup.

Self-Serve
To follow the nature of Family Style Meal Service, children were asked to serve themselves. This provided an opportunity to acknowledge autonomy and choice. Children were encouraged to try each snack item. This was done through caregivers and graduate students modeling healthful behaviors.
APPENDIX I:

SAMPLE SNACK TIME HANDOUT
Making Snack Time Fun!

Week 1: Happy Face
Edible Fruit Face

What You’ll Need:
- 4 Tortilla
- 1 Apple (ears)
- 4 Raspberry (nose)
- 1 Banana (mouth)
- 1 Kiwi (eyes)
- Cream Cheese
- Brown Sugar
- Vanilla

Makes 4 Servings

1. Prepare the cream cheese spread by combining 1 8oz pkg 1/3 less fat cream cheese, 1/2c brown sugar, and 1 tsp vanilla

2. Slice apple (2 slices for ears), banana (1 piece for mouth), and kiwi (2 slices for eyes)

3. Spread 2Tbs cream cheese dip on tortilla

4. Make the face! 2 kiwi slices for the eyes, 1 raspberry for the nose, ¼ banana for the mouth, 2 apple slices for the ears, and a few rice chex for hair!

Nutritional Information on Back
What’s in one “Happy Face”? 

1 ½ Servings of Fruit (¼ apple, ¼ banana, ¼ kiwi, 1 raspberry)

2 Serving of Grains (1 tortilla)

It is recommended that your child consumes 2-3 servings of fruit a day and 6-11 servings of grains a day. Your child’s stage of growth and development, appetite, and activity will influence on what portion sizes are right for your child.

Substitutions for your “Happy Face”!

- Waffle
  - Gluten-Free waffles are available (Brand ex.: Van’s)
- Gluten Free Tortillas:
  - Gluten-Free Tortillas are available (Brand ex.: LiveGFree, Rudis, Udi’s)
  - Traditional Corn Tortillas are Gluten-Free
APPENDIX J:

DEMOGRAPHIC QUESTIONNAIRE
Parental Demographic Questionnaire

**Participant Code:** __________________________ 
DOB: __________________ Boy / Girl

Ethnicity/Race: Caucasian__________ African American_________ Hispanic _________ Other_________

Height: ______________ Weight: ______________

**Mother’s Name:** __________________________ Phone: ______________
Primary Language: ________________ Email: __________________________
Ethnicity/Race: Caucasian__________ African American_________ Hispanic _________ Other_________

Height: ______________ Weight: ______________
Mother’s occupation and highest degree: ___________________________________________________

**Father’s Name:** __________________________ Phone: ______________
Primary Language: ________________ Email: __________________________
Ethnicity/Race: Caucasian__________ African American_________ Hispanic _________ Other_________

Height: ______________ Weight: ______________
Father’s Occupation and highest degree: __________________________________________________

*Indicate with * which of the above is the primary caregiver*

Who lives in the home with your child (parents, siblings, extended family…): __________________________

Age of siblings, if applicable: __________________________

How many people are currently living in the household including yourself? __________________________

Type of home (SFH, TH, MH, Condo, Apartment): __________________________
SFH = single family home, TH = townhouse, MH = mobile home

Are there stairs? ______ If so, how many stairs inside? ______ outside? __________

How many days per week do they play outside? __________________________

How many days per week do they play at the park? __________________________

How far is the nearest park in blocks (distance) or time it takes to walk? __________________________

How much time per day do they watch TV? __________________________

How much time per day do they play on the computer? __________________________

How much time per day do they play on a tablet or hand held device? __________________________

How much was your total household income in 2014? *Circle category below*

Less than $10,000

$10,000 to $14,999

$15,000 to $24,999

$25,000 to $34,999
$35,000 to $49,999
$50,000 to $74,999
$75,000 to $99,999
$100,000 to $149,999
$150,000 to $199,999
$200,000 or more

Please mark which sources you receive income from? (Mark all that apply)

1. Income from wages, salary, commissions, or tips
2. Income for rent, interest, dividends, money market funds, trust funds, or other investments
3. Unemployment compensation, disability or workers' compensation
4. Child support payments or alimony
5. WIC (Women, Infants, and Children) supplements
6. SNAP (Supplemental Nutritional Assistance Program e.g. food stamps)
7. Other cash or public assistance programs such as state and county assistance, cash assistance, TANF, AFDC, General Relief, or other government welfare payment programs
8. Any other sources of income
9. None of the above
10. Refused