Parents' Strategies to Support Mealtime Participation of Their Children With Autism Spectrum Disorder

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OBJECTIVE. We identified and described the strategies parents use to support the mealtime participation of their child with autism spectrum disorder (ASD).

METHOD. Twelve families with children with ASD (ages 2–7 yr) participated in videotaped mealtime observations. Qualitative content analysis was used to identify strategies families used to facilitate participation.

RESULTS. Six categories were identified: (1) parent intervening and ignoring, (2) meal preparation and adaptability, (3) play and imagination, (4) distractions, (5) positive reinforcements, and (6) modeling. Props—common child objects that support the child's mealtime participation—were used in the context of multiple strategies. In addition, increased parental vigilance emerged as an important component of all family mealtimes.

CONCLUSION. Families used multiple strategies within and across mealtimes, highlighting the individualistic nature of feeding challenges. Understanding parent mealtime strategies allows for further investigation into the efficacy and development of intervention strategies to promote mealtime participation of children with ASD.

Up to 89% of children with autism spectrum disorder (ASD) experience challenging mealtime behaviors ([Ledford & Gast, 2006](#)) and are 5 times more likely than their peers to have significant feeding challenges ([Sharp et al., 2013](#)). These challenges in ASD have been described as picky eating, excessive intake of a limited variety of foods, resistance to new foods, leaving the table frequently, throwing or dumping food, and detailed or time-intensive mealtime routines ([Kral et al., 2013](#); [Marshall et al., 2014](#)). The associated limited food repertoires, sensory challenges, and food refusal behaviors can lead to nutritional deficits, restricted diets, and limitations in a child's ability to participate in family mealtime routines ([Ledford & Gast, 2006](#); [Nadon et al., 2011](#)).

Feeding challenges can have a profound effect on a child with ASD's participation in mealtime. Children with ASD also have a higher prevalence of disruptive mealtime behaviors (e.g., food refusals, tantrums, crying) than typically developing children ([Kral et al., 2015](#); [Zobel-Lachiusa et al., 2015](#)). Challenging mealtime behaviors may include having significant difficulties staying at the table or having a highly selective diet that precludes the child from eating the same foods as the rest of the family ([Ledford & Gast, 2006](#); [Sharp et al., 2013](#); [Suarez et al., 2014](#)). Opportunities for the healthful benefits of family mealtime also were minimized, with the family's focus oriented around the child with ASD and the feeding challenges ([DeGrace, 2004](#)). A child's feeding challenges not only affect his or her ability to eat with family members but can also change the experience of mealtime for the entire family unit ([Ausderau & Juarez, 2013](#)).

Family Mealtime

Eating as a family has been shown to positively contribute to the physical and social–emotional well-being of family members ([Boutelle et al., 2003](#); [Rockett, 2007](#)). Mealtimes help develop family identity, provide structure, support family

cohesion, encourage a sense of belonging, and positively influence the health and well-being of family members (Curtin et al., 2015; Fiese et al., 2006; Fruh et al., 2011; Prior & Limbert, 2013; Spagnola & Fiese, 2007). Every family engages in mealtime in their own unique way, from structured mealtimes to a more flexible approach (Fiese et al., 2006).

These experiences carry individual family meaning and help build emotional connections through positive interactions and conversations (Fiese et al., 2006; Fruh et al., 2011; Prior & Limbert, 2013; Spagnola & Fiese, 2007). Diminished participation in or interruption of mealtimes can lead to increases in parental stress and unhealthy outcomes for children (Fishbein et al., 2016; Fulkerson et al., 2008; Videon & Manning, 2003). Unfortunately, feeding challenges and associated behaviors in children with ASD disrupt family mealtime routines and reduce opportunities for family engagement at mealtimes (Suarez et al., 2014).

Mealtime Strategies

Parental feeding strategies have been most commonly studied in families with children who are obese (Moens et al., 2007) or with specific medical diagnoses such as Type 1 diabetes (Patton et al., 2008) or cystic fibrosis (Powers et al., 2005). Although certain strategies are arguably unique to certain populations, overall, parents try to exert more control over mealtime and use particular strategies with increased intensity and frequency when compared with typical families. However, most strategies (i.e., coaxing and physical prompts) are deemed to be ineffective because children still ate less (Patton et al., 2008), and control strategies (i.e., restricting foods or pressuring the child) become maladaptive to targeted behaviors (Moens et al., 2007; Patrick et al., 2005). However, the unique behaviors and eating patterns of children with ASD have yet to be assessed in a family mealtime context considering parent strategies.

An emerging body of literature has assessed therapist-directed intervention strategies implemented by parents to increase food acceptance in their children with ASD. Odar Stough et al. (2015) found that direct commands and parents physically feeding their child during mealtime were related to increased bite acceptance. Kodak and Piazza (2008) reviewed the literature related to behavioral approaches (e.g., escape–extinction, reinforcement, modeling) to treat feeding disorders in children with ASD; they found varying levels of success related to food-refusal goals. Although limited follow-up data exist on the sustainability of gains achieved with discrete behavioral approaches, findings on how those behaviors are integrated into family mealtime are scarce. Family mealtime goals for the child with ASD may or may not be related to specifically consuming bites of a nonpreferred food, which is often the target of intervention. Although potentially useful for increased bite acceptance, targeted behavioral intervention strategies may be significantly different than parent goals or strategies used within mealtime to support participation.

Parent strategies to support their children with ASD during mealtime have yet to be studied in ecologically valid contexts. However, the need to identify, describe, and understand these strategies to develop effective interventions for feeding challenges has been well established (Ledford & Gast, 2006; Odar Stough et al., 2015). The purpose of this study was to identify specific parent strategies and describe how they are implemented during mealtime to support their child's participation in family eating experiences.

Method

Research Design

The current study was a qualitative investigation of typical mealtimes for families with children with ASD. Data were gathered by observing and videotaping family mealtimes and were analyzed with qualitative content analysis. This study was part of a larger mixed-methods study that aimed to further characterize feeding disorders and family mealtimes in children with ASD and their impact on family mealtimes.

Participants

Participants were recruited through a local university research registry that included families of children with ASD in the larger geographic region who were interested in research participation. The research registry was approved by the university institutional review board, with ongoing family recruitment through multiple university and hospital clinics as well as community advertisements and mailings. In addition, fliers were displayed in organizations that served families of children with ASD. Families recruited for participation were English speaking, had at least one child with ASD (diagnosed through the university center or community professional) between the ages of 2 and 7 yr, and had parent-reported feeding challenges. Families of children with co-occurring diagnoses (e.g., genetic disorders), significant physical disabilities (e.g., cerebral palsy, seizure disorders), and primary sensory impairments were excluded. Twelve families participated in the study, for a total of 14 children with ASD and feeding challenges. Table 1 summarizes child and family characteristics.

Procedure

Parents completed a background questionnaire that collected information on family demographics, and researchers observed and videotaped one to two family mealtimes. For the larger study, families completed two to three interviews,

Table 1. Child and Family Characteristics

Characteristic	<i>n</i> (%) or <i>M</i> (<i>SD</i>)
Children (<i>N</i> = 14)	
Current ASD diagnosis (allowed to select more than one)	
Autism/autistic disorder	10 (71.4)
Asperger syndrome	1 (7.1)
PDD–NOS	3 (21.4)
Gender	
Male	11 (78.6)
Female	3 (21.4)
Chronological age, mo	65.1 (18.4)
Race/ethnicity (allowed to select more than one)	
White	14 (100)
Hispanic or Latino origin	0
Families (<i>N</i> = 12)	
Average no. of siblings	1.0
Families with multiple children with ASD	2
Mother's college education	
≤ Partial high school	0 (0)
High school or GED	1 (8.3)
Associate's degree or partial college	2 (16.6)
Bachelor's or master's degree	9 (75.0)
Advanced degree, such as doctorate	0 (0)
Two-parent household	11 (91.7)
Annual household income, \$	
<20,000	2 (16.6)
20,000–39,999	0 (0)
40,000–59,999	2 (16.6)
60,000–79,999	2 (16.6)
80,000–99,999	2 (16.6)
≥100,000	4 (33.3)

Note. Percentages do not total 100% because of rounding. ASD = autism spectrum disorder; GED = general educational development; PDD–NOS = pervasive developmental disorder—not otherwise specified.

with at least one of the interviews taking place before the mealtime observation to begin to establish family rapport. The same researcher who completed the interviews also videotaped the mealtime to provide consistency for the family. One researcher would arrive at the family's home to videotape approximately 30 min before the family initiated mealtime. The early arrival allowed the child and family to habituate to the camera.

The researcher typically stood approximately 3–6 ft from the table. However, sometimes children or family members attempted to engage with the researcher. Researchers encouraged families to construct their mealtime as typically as possible and directed the family back to the meal when necessary. The family determined which mealtimes were observed and what constituted a "typical mealtime" to obtain a valid representation of their family mealtime. Some families suggested that two distinct types of mealtimes routinely took place, for example, eating only with siblings at a kitchen counter for lunch and with a larger family unit for an evening meal. In those circumstances, two different family mealtimes were videotaped. Each family received a stipend for their participation after completion of the larger study. Institutional review board approval was obtained, and each family gave informed consent for their participation. In this study, we report only on the video data.

Data Management and Analysis

A qualitative conventional content analysis was conducted with video data to identify the strategies that parents used to promote engagement in mealtime. *Content analysis* is a systematic method that allows for inferences to be made about data, including trends and patterns, by compressing the data into content categories based on a specific coding scheme (Stemler, 2001). This technique is often used with text data but can also be used for coding actions and behaviors observed with video data, as in the current study (Elo & Kyngäs, 2008; Stemler, 2001). The research on parent feeding strategies is limited, so an inductive approach to content analysis was most appropriate (Elo & Kyngäs, 2008).

Before initiation of the analysis, research team members ($N = 11$), primarily graduate students and the principal investigator, participated in both formal and informal education and discussion to become familiar with qualitative methods, study design, and specific analysis implemented for this study. First, research team members watched the videos to gain a sense of the data as a whole, beginning to identify strategies being used by families within and across mealtimes. All team members participated in each phase of the video analysis. For the purpose of this study, we considered a strategy to be any technique, regardless of success, that a parent or caregiver used to encourage a child's participation in eating and mealtime.

Next, small groups of researchers (2–3) watched videos together to begin to clarify strategies, develop preliminary definitions, and group strategies into initial categories. Throughout the process, team members were randomly grouped into small teams or pairs for analysis activities. Small groups brought their findings back to team meetings that were held 1 or 2 times per week during the analysis process. In team meetings, definitions of strategies were refined, confirmed, and organized into categories. In addition, team meetings were used to review mealtime videos as a group and to develop a consensus, at least 90% agreement, on strategies.

A final coding scheme was developed in which individual strategies were condensed and organized into final categories (Graneheim & Lundman, 2004). Observer XT (Noldus, Wageningen, the Netherlands) was used to assist with data management and analysis. Using the final coding scheme, two different researcher pairs coded each video. The coding agreement between the pairs was evaluated, with disagreement being resolved through peer discussion and refinement of the coding scheme and category definitions as necessary. After agreement on codes was established, all videos were coded by two independent researchers (from the larger team) for defined mealtime strategy categories. Interrater reliability was calculated between the final coding of the two independent researchers on all videos.

Researcher triangulation and interrater reliability measures were used to increase validity and reliability of the analysis. Researcher triangulation was established through weekly discussion over several months, with 11 research team members collaboratively identifying and redefining category definitions as well as reviewing coding agreement and disagreement (Carter et al., 2014). To formally evaluate coding, agreement measures of interrater reliability were calculated using Cohen's κ coefficient (Cohen, 1960) between raters for each video.

Results

Family mealtime videos were highly variable in content, reflecting the heterogeneity of family mealtime with children with ASD. Videos ranged in length from approximately 20 to 60 min. Families were encouraged to indicate the beginning and conclusion of mealtime so that the researcher could initiate and conclude videotaping. Family mealtimes ranged from all family members sitting at a table together eating to siblings sitting at TV trays eating in front of a TV show with a parent standing behind them eating his or her meal. Because the child with ASD was the focus of the study, if the child did get up and leave the table or eating location, the researcher would attempt to follow the child and capture potential parent strategies.

For example, one family mealtime included one parent and a sibling sitting at the table with the child with ASD coming to the table to take one to two bites and then going back to jump on the trampoline before returning for another bite. In this scenario, researchers tried to capture the broader picture of the child coming and going from the table. Although we observed great variation in mealtime construction, similarities in parent strategies were still identified across mealtime videos.

A qualitative conventional content analysis was used to identify parent strategies in 17 mealtime videos across 12 families. Six different categories were identified that encompassed the strategies that were observed in the mealtime videos: (1) Parent Intervening and Ignoring, (2) Meal Preparation and Adaptability, (3) Play and Imagination, (4) Distractions, (5) Positive Reinforcements, and (6) Modeling (see Table 2 for definitions and examples of the parent mealtime strategies). Multiple strategies were used within a family and often within one meal. However, strategies were used in varying frequency across the participants, with Parent Intervening and Ignoring and Meal Preparation and Adaptability being the most prevalent and Modeling being the least common.

Increased parental vigilance through parent actions and visual watchfulness was commonly observed across all families throughout the majority of mealtimes. Parents positioned themselves to monitor and control the physical participation of the child and, when possible, maintain visual contact on the child to diligently monitor and intervene as necessary. *Props*, usually common child objects (e.g., blankets, toys, pacifiers, balls) that support the child's participation in mealtime, were used by 10 of the families in the study. Props were not a distinct strategy but rather were used within other mealtime strategies, most commonly Mealtime Preparation and Adaptability, Distractions, and Positive Reinforcements. The use of props during mealtime was explored further with a secondary data analysis (Muesbeck et al., 2018).

Coding Reliability

Interrater reliability was calculated using Cohen's κ coefficient between final raters for each video (Cohen, 1960). Moderate κ values ($>.41$) were considered acceptable (Viera & Garrett, 2005) while taking into consideration the qualitative nature of the analysis and subjective interpretation of behaviors. All coded videos were reviewed for agreement on the presence of Meal Preparation and Adaptability and Props, rather than on time of occurrence, which was determined to more accurately capture the nature of the strategy. All other strategy codes were matched on time of occurrence within a 20-s window, with final values for each video ranging from .42 to .76 (mean = .60).

Table 2. Strategies, With Definitions and Examples

Strategy	No. of Families Using Strategy	Definition	Examples
Parent Intervening or Ignoring	12	Response to an undesired behavior in the form of intervention or ignoring: <i>intervening</i> is using short, directive comments and physical support to intervene and often redirect the child's behavior; <i>ignoring</i> is an evident lack of response to a common socially undesirable behavior.	Intervening: Child is throwing pieces of food on the floor; parents tells the child, "No throwing food" and redirects the child to put the pieces of food in the mouth. Ignoring: Child dumps the plate of food on the floor or spits out the food on the table, and the parent does not respond.
Meal Preparation and Adaptability	11	Intentionally arranging the mealtime space and preparing specific meals or food that prioritize the needs of the child with ASD over those of the family as a whole. Throughout the mealtime, adjustments to the space and food were often necessary in response to the child's behavior.	A parent-organized mealtime for the entire family around the kitchen island because the child with ASD was unable to stay seated at the table. A parent prepared a family meal but left all the ingredients separate on the table in the hopes the child with ASD might eat one ingredient, the shredded cheese.
Play and Imagination	6	Play and imagination were incorporated into mealtimes to engage the child with food or family members. Parents pretended the food was another object, gave food imaginary power, or created interactive stories and games to entice the child to participate in eating.	A parent told his son that eating green beans would improve his Kung Fu skills. The mother, father, sibling, and child with ASD collaboratively participated in a food naming and guessing game that encouraged the child with ASD to stay seated at the table with his family to eat.
Distractions	5	Games, activities, or objects (e.g., toys, TV, iPad, books) were used to divert the child's attention away from eating and encouraging the child to focus on something else.	Parent reads books aloud to the child with the child alternating between eating independently and the parent feeding the child. A parent allowed the child with ASD to use an iPad at the dinner table to encourage the child to stay at the table with the family.
Positive reinforcements	4	Positive reinforcement was used in the form of verbal praise, physical encouragement, or child-friendly incentives to encourage mealtime participation, desired behaviors, and eating.	Parents attempted to use gumballs and other food items as an incentive for the child to eat a nonpreferred food or provide hugs or high fives after a positive behavior.
Modeling	4	Parents, siblings, and other caregivers modeled desired mealtime behaviors related to how the child was expected to act and foods the child should eat or taste during mealtime. Modeling was naturally integrated into the mealtime and contrived and clearly developed as part of outside therapy experiences.	"Look! Joey took a bite of his food, can you?" "I can kiss the pepperoni, now you and your brother both kiss the pepperoni." Parents and siblings used verbal and physical cues while modeling desired mealtime behavior (e.g., sitting in the chair, using utensils, wiping the face with a napkin) to encourage the child with ASD.

Note. ASD = autism spectrum disorder.

Discussion

Six unique categories of strategies were identified within and across family mealtimes that parents implemented to support their child with ASD. In addition, 10 of the families integrated Props (items used to support the child's participation) into their mealtime routines within other strategies. Parents often used multiple types of strategies within the context of one meal to target the complex interaction of the behavioral, environmental, social, and sensory components of the child's participation.

A common thread through all mealtimes was a sense of constant vigilance and need to have the mealtime revolve around the child with ASD, which is consistent with the literature. Parents monitored and altered the physical and social environment around the child to support the child in the daily activity of mealtime (Larson, 2010; Schaaf et al., 2011). A heightened sense of *watchfulness*, a common occurrence in our study shown by consistently maintaining visual contact with the child, is also common among parents with children with ASD (DeGrace, 2004; Larson, 2010; Woodgate et al., 2008). For example, a caregiver may position the child in a seating arrangement between two adults to support

the child staying at the table, or the caregivers may position themselves so that they are able to closely visually monitor the child with ASD to quickly anticipate when verbal or physical support may be necessary. In addition, family activities tended to revolve around the child with ASD, and all aspects of the activity were considered with the child in mind (Bagby et al., 2012; DeGrace, 2004). Parents had to cater the mealtime toward the specific needs of the child with ASD to encourage his or her participation.

Parent strategies had a wide range of goals to encourage participation and eating, such as encouraging or eliminating child behaviors, supporting the child's regulation, increasing overall calorie consumption, and even attempting to expand the child's repertoire of food. The goal of child participation at some level was often achieved, but it was unclear whether the desired eating behavior was affected. Although the ultimate success of the strategies was beyond the focus of the study, children were rarely observed to eat or try nonpreferred foods. However, more frequently, children were observed to stay at the table, engage with family members, or eat a greater quantity of a preferred food in the presence of parent strategies.

Intake of new foods to expand a child's repertoire or increase quantity of a new or nonpreferred food is often the focus of intervention (Sharp et al., 2013). However, the results of this study suggest that parents are using strategies to support multiple other behaviors related to mealtime to keep children at the table and participate in the mealtime experience with family members. Therapists must consider the importance of families sharing the same space and being a part of the mealtime experience as an important aspect of a child's feeding behavior. Although selective diets are primary feeding concerns for children with ASD (Ahearn et al., 2001; Schreck et al., 2004; Williams et al., 2005), child behaviors may be a barrier to addressing these concerns in the context of family mealtime, or possibly mealtime participation in itself is deemed by families to be of increased importance. Occupational therapy practitioners need to acknowledge the complexity of family mealtime to determine mealtime goals that are important for the family while addressing the child needs that are the greatest barrier to those goals.

Strategies identified in this study of children with ASD shared some commonalities with mealtime strategies in other populations, such as positive reinforcement and parent intervening with directive commands (Orrell-Valente et al., 2007; Patton et al., 2008). However, the most common focus of interventions in other populations was increased food intake with limited success (Moens et al., 2007; Patton et al., 2008). Common strategies identified across populations may warrant further investigation related to their success with different goals (i.e., staying at the table or decreasing problem behaviors) rather than increased food intake of familiar or unfamiliar food. Interestingly, Patton et al. (2008) labeled play and engaging with food as maladaptive child behaviors, whereas in our study those behaviors were actually parent-initiated strategies that supported engagement with the meal and family. Families and children with ASD may have distinct strategies and mealtime goals because of the unique characteristics of the disorder.

Implications for Occupational Therapy Practice

Previous research has cited the need for a deeper understanding of how families manage daily routines (e.g., mealtime) to inform practice and intervention (Bagatell et al., 2014; Denham, 2003; Fiese, 2007). The findings of this study contribute to building this understanding through the description of six unique categories of parent strategies used to increase mealtime participation in children with ASD. These categories highlight the complexity of strategies used by families and the flexibility in application of multiple strategies within a single mealtime.

The most common intervention to address feeding challenges in the literature is applied behavior analysis using single-subject/case design, often focused on increasing the number of bites accepted or swallowed outside of the mealtime (Matson & Fodstad, 2009). This expanded understanding of how families of children with ASD manage mealtime could contribute to the development of family-level interventions to increase mealtime participation and improve eating behaviors within the mealtime context. The variety and overlap of strategies applied within families demonstrate a need for interventions that holistically address multiple components of mealtime participation

(e.g., regulation, behavior, food repertoire) and characteristics of each family. The following implications for occupational therapy practice and research should be considered:

- In the context of everyday mealtime occupations, parents' strategies were often about shared time and space versus promoting new eating behaviors.
- Mealtime strategies identified in this study provide an emerging framework for occupational therapy practitioners to discuss strategies that families are currently using as well as their purpose, success, and potential disadvantages that can guide intervention.
- Interventions for feeding should be individualized to family needs, multifaceted in nature to address all aspects of feeding challenges, and implemented in ecologically valid contexts.

Limitations and Future Research

A limitation of direct observation is the potential for the Hawthorne effect to influence the typical mealtime behaviors of the family; that is, the researcher's presence may influence the mealtime setup and execution. To minimize this effect, researchers spent time in the home interviewing family members before observing and videotaping meals. At least one study has found that family characteristics (i.e., socioeconomic status, child and parent gender) influence the type and frequency of strategies used during mealtimes (Orrell-Valente et al., 2007). Future research should work toward recruiting a more diverse and culturally representative sample to explore how these variables may influence parent strategies in families with children with ASD. In addition, a larger sample further reflecting the vast heterogeneity of ASD and feeding challenges may potentially uncover additional strategies that families use at mealtimes.

Future studies should strive to identify the parental purpose and efficacy of the identified strategies. In addition to the immediate success of the strategies, long-term implications on the child's eating patterns, self-regulation, and growth should be considered. Although the efficacy was not the focus of this study, clear identification of what parents perceive to be working and why, as well as objective measures of success, could further support the development of family-centered mealtime interventions. Future studies should also consider blending interventions currently discussed in the literature with parent strategies as a means to evaluate multifaceted interventions that can be embedded within family mealtime.

Conclusion

The findings from this study provide insight into the practicalities of family mealtime with children with ASD. Limited evidence-based interventions to support children with ASD and feeding challenges during mealtime currently exist. Identifying and understanding strategies used in everyday mealtime experiences to encourage participation will inform the development of in-home, parent-mediated interventions that target not only the needs of the child but also goals related to successful family mealtime participation. ■

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