



# Eating and Mealtime Challenges for Families and Children with Autism Spectrum Disorder

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- Overview of Autism Spectrum Disorder and Feeding Challenges
- Assessment for Children with Autism Spectrum Disorders
- Parent-Mediated Intervention for Children with Autism Spectrum Disorder with Disrupted Feeding





# ASD and Feeding

- Disrupted feeding patterns first described by Kanner (Kanner, 1943)
- 46 to 89% of children with ASD display challenging behaviors throughout mealtimes (Ledford & Gast, 2006)
- Five times more likely than their peers to have significant feeding challenges (Sharp et al., 2013)
- Children with ASD and feeding challenges at risk for detrimental medical, developmental, and social outcomes (Sharp, et al., 2011; Manikam & Perman, 2000; Winston, et al., 2010; Gahagan, 2012)



# ASD and Feeding

- Feeding challenges are common associated characteristics and are closely related to core symptomology
- ↑ sensitivity to foods and environment + with ritualistic behaviors, contributes to food selectivity and aberrant feeding habits (Ledford & Gast, 2006; Marshall, Hill, Ziviani, & Dodrill, 2014; Schreck & Williams, 2006)
- Restricted and repetitive behaviors, contribute to overall feeding rigidity further promoting limited diets and potential nutrient deficiencies (Suarez, Atchison, & Lagerwey, 2014)



# ASD and Feeding

- Feeding challenges in children with ASD can include *any difficulty* (e.g., health, behavior, motor, sensory, or physiological) that interferes with
  - proper nutritional intake
  - food acceptance
  - appropriate mealtime interactions
  - typical family routines

(Johnson et al., 2014; Ledford & Gast, 2006; Sharp et al., 2013).





# ASD and Feeding

**Social Context**

**Disordered Feeding**

Sensory Processing

Behavior

Oral Motor

Health



# Sensory Processing

- Variable perceptions and responses to food properties (smell, taste, texture, visual presentation, and temperature)
- Food selectivity, texture selectivity, and food refusal
- Narrower variety of foods
- Seek out certain foods with sensory properties (e.g., crunchy or chewy), rigid sensory-based food preferences, “stuck” on certain textures or flavors, gagging or vomiting
- Sensory “environment”



(Hubbard et al., 2014; Mari-Bauset et al., 2013; Rogers et al., 2012; Zimmer et al., 2012)



# Oral Motor

- Overlooked
  - Oral motor deficits and dyspraxia
  - Difficulty chewing, decreased tongue mobility, pocketing, overstuffing, drooling, gagging, or choking on foods or liquids
  - May not yet developed thoroughly
  - Prolonged mealtimes and food acceptance based on the food texture/difficulty
- (Nadon et al., 2011; Schreck & Williams, 2006; Sharp et al., 2013)





# Health

- Allergies and GI dysfunction have higher prevalence
- Gaseous, bloating, diarrhea, constipation, abdominal pain, vomiting, food sensitivities, and pain with stooling
- Emerge as aggression, self-injurious behaviors, sleep disorders, social withdrawal, and disrupted feeding patterns
- Must be address in correlation with feeding intervention

(Berry et al., 2015; Buie, 2015; Chaidez, Hansen, & Hertz-Picciotto, 2014; Geier, Kern, & Geier, 2012; Gillette et al., 2015; Vuong & Hsiao, 2017; Zimmer et al. 2012)



# Selective Diets and Nutrition

- Eliminate entire foods groups or excessive intake of snack or processed food
- More likely to have serious nutrient deficiencies
- Associated medical concerns such as obesity, osteopenia, or constipation
- Mixed literature on growth.....(Green, Dissanayake, & Loesch, 2015; Hill, Zuckerman, & Fombonne, 2015; Hyman et al., 2012; Sharp et al, 2013)

(Bandini et al., 2010; Croen et al., 2015; Keown, Bothwell, & Jain, 2014; Ledford & Gast, 2006; Tang, Piazza, Dolezal, & Stein, 2011; Zimmer et al. 2012)





# Behavior

- Behaviors are often a consequence of underlying challenge
- “Rules” about food, eating, and feeding process
- Tantrums, aggression, refusal to eat, unwillingness to sit at the table, throwing or spitting out food
- Interfere with consuming adequate nutrition and appropriate mealtime routines and interactions



(Williams & Seiverling, 2010; Nadon, et. al., 2011; Provost et. al., 2010; Zimmer et. al., 2012)





# Behavior

Sensory-based, oral-motor, and GI concerns all are associated with greater behavioral challenges around **eating** (Berry et al., 2015; Chaidez et al., 2014; Hubbard et al., 2014; Mari-Bauset et al., 2013)





# Parent-Child Interactions

- Eating is embedded in the parent-child relationship
  - Provide food
  - Model eating behaviors
  - Regulating intake
  - Family and cultural values
- Stress for parents, child, and other family members
- In a study of family routines, 92% of study participants classified dinnertime as the most stressful part of their day, with one mother describing it as “hell on earth.” (Marquenie, 2011, p.151)





# Mealtime

- Mealtimes are an important daily family routines and have been associated with language development, physical health, academic achievement, and socialization

(Gillman, 2009; Eisenberg, 2004; Larson, et. al., 2006; Stanek, 1990; Fiese, 2008)

- Mealtimes provide an opportunity for a daily structured routine for families often supporting larger family goals and communication (Fiese, 2006; Evans, 2008)

- Mealtime conversations for families with children with ASD included recalling the events of the day and planning future family events (DeGrace, 2007)





# Autism Spectrum Disorders, Feeding and Family Mealtime Project

## Overall Aims

- Characterize feeding patterns, mealtime behaviors, and the severity of feeding disorders in children with autism spectrum disorder.
- Establish associations between the defined feeding characteristics and the child's growth, dietary status, and family and child outcomes.
- Understand the role parent-child interactions play in the feeding process.
- **Develop multi-faceted evaluation tools to more accurately assess feeding in children with ASD.**
- **Design and implement evidence-based family-center interventions to address feeding challenges for children with ASD**



# Feeding Assessment for Children with Autism Spectrum Disorder

- Online survey
- 406 caregivers of children age 2-12 years with ASD
- Recruit participants through Interactive Autism Network (IAN)
- Questions; Sensory: 13, Behavior: 17, Health: 11, Oral Motor: 10
- Additional questions – clinical utility

Funding: Wisconsin Alumni Research Foundation/MSN 154607 and Virginia Horne Henry Fund

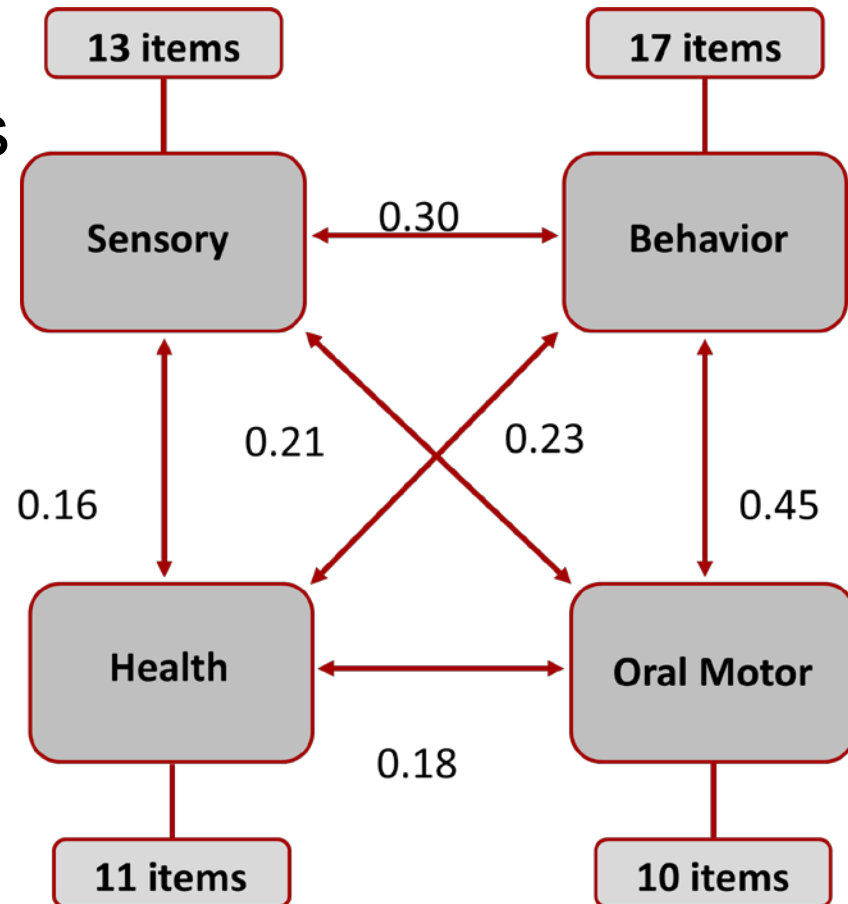




# Feeding Assessment for Children with Autism Spectrum Disorder

- Good internal consistency (.87)
- Confirmatory Factor Analysis
  - Factor loadings were adequate and statistically significant ( $p < .001$ ) with all loadings  $>.22$  and majority  $>.4$
  - Adequate model fit indices

Statistic	Values
Chi-Square	(4829.04) 1218*
RMSEA	.086 (.083 to 0.088)
SRMR	.098



*Between Factor Correlation Matrix*





# Parent-Mediated Intervention for Families with Children with Autism and Feeding Challenges



The project described was supported by the UW-Madison Clinical and Translational Science Award (CTSA) program, through the NIH National Center for Advancing Translational Sciences (NCATS), grant UL1TR000427 as well as the UW School of Medicine and Public Health's Wisconsin Partnership Program (WPP).



# Stakeholder Engagement and Collaboration

- Parents
- Communication Innovations (interventionists)
- Autism Society of Wisconsin
  - Intervention
    - » Content
    - » Frequency
    - » Facilitators
    - » Barriers



# Participants

- 15 families, 17 children with ASD
- Children have a diagnosis of ASD between the ages of 2 to 7 years at the initiation of the study
- Family reported feeding challenges-highly heterogeneous
- Able to participate in a six-month in-home intervention
- Exclusion criteria



# Intervention Overview

- Intake Evaluation

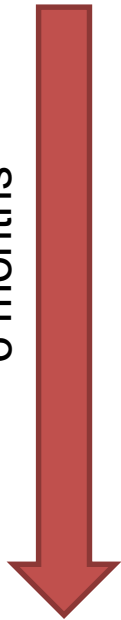
- Parent Training Modules

- Direct Intervention in Collaboration with Parents

- Parent Coaching

- Post Evaluation

6 months





# Parent Training Modules

- 1:1 in the home
- Designed to address the multiple topics related to eating and mealtime
  - Goal Setting – Goal Attainment Scaling
  - Mealtime Routines
  - Development of Eating and Feeding Skills
  - Behavior
  - Sensory Processing
  - Parent Child Interactions
  - Diet and Nutrition
  - Underlying Health Challenges



# Intervention and Coaching

- In-home
- Address collaborative goals
- Goal Attainment Scaling
- Involve family and caregiving team
- Integrate strategies into daily routines
- Sessions-variable depending on family and goals
  - Check-in
  - Warm-up activity (play, planning, food prep, etc)
  - Snack or meal
  - Wrap-up
- Parent Training-ongoing, separate, integrated



# Preliminary Results

- Three families completed
- All families met or exceeded >80% of collaborative goals
- Positive changes in family mealtime, self-help skills, decreased behaviors, increasing flexibility, and exploring (tasting) new foods (completed and midterm)
- Moderate success introducing developmentally appropriate sized portions into family meals







# Next Steps

- Complete remaining families
- Iterative process.....
- Other activities of daily living....
- Parent-Mediated Intervention for Families with Children with Autism and Feeding Challenges: Behavior and Physiological Outcomes





# Questions

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**THANK YOU!**





<b>Gender (N=406)</b>	
% Male	83.5
<b>SRS/SRS-P Total Score (SD) (n=)</b>	XX.X (XX.X)
<b>Chronological Age (SD) (N=406)</b>	8.2 (2.9) years
<b>IQ Score (N=406) (%)</b>	
≤40	4.7
41-55	4.7
56-70	9.9
71-85	11.0
86-115	19.2
115-130	15.7
>130	11.0
Unknown	22.1
Choose not to answer	1.7
<b>Maternal College Education (N=406) (%)</b>	
Partial High School or Lower	0.4
High School or GED	14.8
Associates/Partial College	23.4
Bachelor or Master Degree	54.2
Advanced Degree	6.2
Choose not to answer	1.0
<b>Annual Household Income (N=406) (%)</b>	
Less than \$20,000	10.6
\$20,000 to \$39,999	12.6
\$40,000 to \$59,999	14.3
\$60,000 to \$79,999	14.0
\$80,000 to \$99,999	7.9
\$100,000 or more	31.0
Choose not to answer	9.6
<b>Race/Ethnicity (allowed to select one or more) (N=406) (%)</b>	
African-American	7.3
American Indian/Alaskan Native	4.6
Asian	4.2
Native Hawaiian/Pacific Islander	1.2
Other	4.1
White	88.5
Hispanic or Latino Origin	13.5