Effectiveness of Feeding Therapy Approaches on Consumption and Dietary Variety in Children With Sensory-Based Feeding Challenges

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Effectiveness of Feeding Therapy Approaches on Consumption and Dietary Variety in Children With Sensory-Based Feeding Challenges

[May 11, 2023]

This evidence project, submitted by
Josie Ash, Kayla Estes, Cecilia Morales, Rachel McElroy

has been approved and accepted in partial fulfillment of the requirements for the degree(s) of Master of Science in Occupational Therapy (and) Occupational Therapy Doctorate from the University of Puget Sound.

__________________________
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Chairs, School of Occupational Therapy:
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__________________________
Dean of Graduate Studies: Sunil Kukreja, PhD

Key words: Feeding therapy, Sensory-based, Children, Feeding challenges
Abstract

This project was completed in collaboration with Hannah Michlmayer (OTR/L) at Therapy Services for Children in Seattle, Washington. The research team conducted a literature review to investigate the following question: For children ages 3-12 with sensory-based feeding challenges, what are the most effective interventions to improve dietary diversity and/or food acceptance? Evidence indicates that ABA-based interventions are the most studied, followed by video modeling and caregiver/parent training. These approaches demonstrate short-term increases in consumption and dietary variety. Most studies had small sample sizes with minimal long-term follow-up. There is a lack of research on group interventions, the SOS approach, and other sensory-based interventions (all used in OT practice). Further research in the following domains is strongly recommended: long-term follow-up studies, group feeding therapy approaches, sensory-based interventions, qualitative research, and higher level study designs.

Knowledge translation (KT) activities focused on helping the collaborator improve service delivery of the SOS method and data collection on its effectiveness. Current caregiver/parent education materials were modified to increase accessibility for families to track their child’s progress at home, and a home documentation log was created to facilitate more robust progress tracking over time. Generalizable conclusions about the effectiveness of each KT activity cannot be drawn due to the small sample size of feedback providers. However, feedback received indicates the home documentation log was understandable and easy to use for caregivers/parents, and an effective progress monitoring tool for the collaborator. Collaborator feedback also indicated increased accessibility of caregiver/parent education materials. This suggests potential for home documentation and caregiver/parent education materials to facilitate increased progress tracking and understanding of the SOS feeding approach.
Critically Appraised Topic

Professional Practice Scenario

Therapy Services for Children is a small, outpatient clinic fully run and managed by five OT practitioners - two part-time, two full-time, and the owner. The owner has 30 plus years of therapy experience while the other OTs - including the collaborating practitioner, Hannah Michlmayr, a full-time OT, have 3 to 4 years. The clinic consists of several different therapeutic areas including two gyms, a craft room, game rooms, swings, and a spacious feeding room with a kitchen. The age demographic of clients served at this clinic ranges from 1.5 to 18 years with the most common ages ranging from 3 to 10 years. Clients younger than 1.5 years with feeding difficulties are typically referred to infant feeding specialists. Client diagnoses may include ASD, ADHD, sensory processing disorders, Down syndrome, anxiety, depression, and general behavioral challenges. Although some clients are seen for feeding aversions, they typically do not have a specific feeding related diagnosis. The majority of clients receiving feeding therapy services have sensory-based feeding difficulties as opposed to motor-based feeding challenges. Few clients are strictly seen for feeding and generally have co-occurring sensory and/or motor goals. Assessments for sensory-based feeding aversions are primarily informal and done through skilled observation and caregiver/parent interviews. The practitioner often administers the Sensory Profile, the BOT, and/or the M-FUN to identify motor and/or sensory concerns that could impact feeding and to address other developmental concerns.

The average length of feeding services at Therapy Services for Children is typically 12 to 14 weeks. If the client requires more intensive services, therapy may last for up to 1.5 years. Clients are typically seen once a week for about 50 minutes, or twice a week if they have higher feeding needs. Specific feeding goals set by the practitioner for clients with sensory-based feeding difficulties include increasing the number of foods in the child’s diet, decreasing anxiety surrounding mealtimes for both the
child and caregivers/parent, decreasing physiological distress in response to foods, and increasing the capacity to respond to new foods in a socially appropriate manner.

Currently, all feeding therapy sessions in the practitioner’s clinic are on an individual basis, encompassing the caregiver/parent-child dyad. The practitioner finds individual therapy useful for providing client-centered care and increasing caregiver/parent involvement. The group therapy approach involves two or more clients in a session with the therapist(s), where caregiver/parents may or may not be present. This approach is not used in the practitioner’s setting at this time. However, the practitioner has utilized group feeding therapy in a previous facility and found aspects of the approach to be useful, specifically peer modeling. While the practitioner has clinical experience with both individual and group feeding therapy, they are less informed of published research evidence supporting the respective efficacy of each approach. The practitioner is therefore interested in both quantitative and qualitative outcomes of sensory-based pediatric feeding therapy. Quantitatively, the main outcome measure used by the practitioner is the number of new foods added to a child’s diet as a result of therapy. Qualitatively, they are interested in outcomes related to the satisfaction of the caregiver/parent and/or child with therapy (including, but not limited to, anxiety reduction, response to foods, and/or capacity to respond to new foods). The practitioner is especially interested in the potential benefits of adding group therapy as a supplement to the current individualized feeding therapy structure. However, they also have some hesitation about the group approach, due to clinical experience with increased caregiver/parent anxiety and the development of learned problem behaviors. Within the organizational structure of their clinic, the practitioner has the ability to advocate for adjustments to current feeding therapy intervention approaches, a process that requires presenting a case to the supervising OT (clinic owner). Therefore, it is vital that the practitioner be prepared with the most current peer-reviewed evidence regarding the effectiveness of proposed approaches. A comprehensive review of the efficacy of sensory-based interventions for feeding challenges, with special attention to the practitioner’s identified outcomes, will
provide necessary evidence for their decision-making process in advocating for an amendment to the clinic's current feeding therapy structure. Importantly, while the practitioner primarily uses the Sequential Oral Sensory (SOS) feeding therapy method - a guided hierarchical exposure to food and elements of consumption - for client sessions, other valid methods exist and are used by other practitioners. One method is applied behavioral analysis (ABA), which uses tangible reinforcements such as a preferred food/toy, or employs escape extinction strategies, including non-removal of the spoon, to increase food consumption. This variation in methods is likely to exist in group therapy approaches as well. Due to the practitioner’s desire to broadly examine the effectiveness of each approach, research encompassing a variety of methods is included in this literature review.

**PICO Question**

For children ages 3-12 with sensory-based feeding challenges, what are the most effective interventions to improve dietary diversity and/or food acceptance?

**Search Strategy**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Key Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient/Client Population</td>
<td>children, kid(s), pediatric(s), child, youth, feeding challenge, feeding aversion, feeding difficulty, oral sensory challenges, pediatric feeding disorder, picky eater, problem feeder, food selectivity, food refusal</td>
</tr>
<tr>
<td>Intervention (Assessment)</td>
<td>Feeding therapy, group feeding, individual feeding, food therapy, pediatric feeding, feeding intervention, feeding treatment, Sensory, sensory based, sensory-based, self-feeding, caregiver feeding, oral feeding, Independent, single client, one-on-one, Individual, group, multiple clients, grouping, 2 or more clients</td>
</tr>
<tr>
<td>Comparison</td>
<td>N/A</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Foods added to diet, number of foods consumed, number of new foods, new foods, increase in foods in diet, increase in variety of foods in diet, satisfaction, response to intervention, response to therapy, report</td>
</tr>
</tbody>
</table>
Databases, Sites, and Sources Searched

<table>
<thead>
<tr>
<th>Databases:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJOT</td>
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<tr>
<td>PsychINFO</td>
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<tr>
<td>PRIMO</td>
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<tr>
<td>Google Scholar</td>
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<tr>
<td>OT Seeker</td>
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<td>OJOT</td>
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<td>CINAHL</td>
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<td>ERIC</td>
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<td>ProQuest,</td>
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<td>PubMed</td>
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<tr>
<td>Cochrane Reviews</td>
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<tr>
<td>WorldCat</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Meta-Analyses and Literature Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Williams, K., &amp; Seiverling, L. (2022).</td>
</tr>
</tbody>
</table>

Inclusion Criteria

Quantitative outcome: Studies examining sensory-based feeding interventions
- Current outcome measures utilized by practitioner

Qualitative Outcome: Studies examining caregiver/child satisfaction and physiological/psychological response to interventions addressing the above quantitative outcomes
- Caregivers are heavily involved in feeding therapy and their satisfaction with the outcomes is one indication of therapy effectiveness and utility. Subjective measures of caregiver and client response to intervention are also of interest to the practitioner.

Published in 2000 or later
- Provides up-to-date information aligning with current understandings of the most effective feeding therapy approaches.

Feeding type: Independent, caregiver assisted
- Studies encompassing each feeding type are relevant to the age range of the population served by the practitioner’s clinic.

Participants: Ages 3-12
- This age range is representative of the clients in the practitioner’s setting. Clients younger than 3 are likely to be referred to an infant feeding specialist and age 12 represents the upper bound of typical ages seen by the practitioner.
**EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN**

**English-language only (including translations)**
- Most accessible language and is the only known language of the researchers. Studies may come from any country so long as an english-translation is available.

**Source Type: Peer reviewed**
- To increase the rigor of the research gathered. Peer review credentials should be verified and publicly available.

**Exclusion Criteria**

**Poster abstracts**
- Do not provide sufficient information or peer review for CAT.

**Feeding therapy research for remediation of motor deficits**
- Clients treated by the practitioner for feeding aversions primarily have sensory-based versus motor challenges related to feeding.

**Student papers not published in peer-reviewed journals**
- Theses, dissertations, capstones etc have not undergone sufficient review

**Intensive in-patient treatment setting**
- Level of intensity of tx does not fit with collaborator setting

**Single case-studies**
- Report of tx does not provide sufficient level of evidence

**Search Outcomes/Quality Control/Review Process**

Twelve databases were searched to find articles encompassing the original PICO question: For children aged 1-18 identified with sensory-based feeding aversions, is there a difference in effectiveness between individual and group feeding therapy interventions in supporting clients in meeting feeding goals? Each team member was assigned three databases. For each database a record of exact search terms and the number of resultant hits was kept in the Search Tracking Table (see Appendix A). When all initial searches had been run, a different team member scanned all hits by title and abstract according to the original exclusion criteria. These hits were recorded as either a Yes or Maybe in the first version of a Master Citation Table. Duplicates were designated in the inclusion section of the Search Tracking Table.

A very high volume of articles resulted from this initial screening. Due to a dearth of group feeding literature, and many studies involving infants/older adolescents, the original PICO question was modified to better reflect the state of feeding literature and the collaborator’s population of interest:
EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN

For children ages 3-12 with sensory-based feeding challenges, what are the most effective interventions to improve dietary diversity and/or food acceptance? Additional exclusion criteria were also added: student papers not published in peer reviewed journals, articles detailing intensive in-patient interventions, and single-subject case studies. These criteria reflect the practitioner’s setting, emphasize rigorous peer review, and support replicability of interventions.

After articles were re-screened by title and abstract to reflect the modified PICO question, all Yes and Maybe articles were entered into the current version of the Master Citation Table and signed by the original recording team member. Full text reviews were then conducted by another team member. Any remaining uncertainty for Maybe articles was resolved through a full-team discussion. Meta-analyses were hand-searched as databases according to the above criteria and then added to the Search Tracking Table when all relevant articles had been extracted. Final Yes articles as agreed upon by the research team were then extracted into the Evidence Tables on page 11.

Research Process: Literature Searching and Article Inclusion

The results of the literature search, as seen in the Search Tracking Table, yielded 9,264 articles that were reviewed by title and abstract. Based on the original PICO question and exclusion criteria, 8,904 articles were initially rejected. Following modification of the PICO question and exclusion criteria, an additional 309 articles were rejected, resulting in a Master Citation Table composed of 51 articles. Three of these articles were inaccessible to the research team and a full-text review was conducted on the remaining 48. Of these articles designated as Yes or Maybe, 21 were excluded after further review. Reasons for exclusion included ages of participants, not being outcomes based, not being sensory based, having a single participant, having in-patient participants, and being a systematic review that did not yield further articles. Twelve of our original Yes articles were rejected after full-text review based on the presence of these exclusion criteria. Of the 13 articles noted as Maybe’s, nine were ultimately rejected and four were included. Six articles were rejected after full-text review based on the previously listed exclusion
EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN

criteria. The other three were rejected because they included participants without sensory-based feeding concerns. This resulted in 27 articles to be included.

Graphic Representation of the Research Process

Adapted PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and other sources

*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

Adapted by University of Puget Sound School of Occupational Therapy
## Evidence

### Experimental

<table>
<thead>
<tr>
<th>Author, year, journal, country</th>
<th>Study Objectives</th>
<th>Study Design/ Level of Evidence</th>
<th>Participants: sample size, description, inclusion &amp; exclusion criteria</th>
<th>Interventions &amp; Outcome Measures</th>
<th>Summary of Results</th>
<th>Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahearn et al. 2002 Behavioral Interventions USA</td>
<td>To investigate the effects of using a single food item compared to using multiple food items when establishing food acc via an escape prevention procedure w/ children w/ FS.</td>
<td>Quasi-experimental study AOTA 2B E3</td>
<td>N= 6, 4M/2F; 4-11y 4 w/ ASD dx, 2 w/dx of PDD-NOS 5 live w/families &amp; receive educational/clinical services from program for 30 hrs/wk. 1 lives in a community grp home operated by school. Incl= All enrolled in a private school that provided educational &amp; clinical service. All were referred for feeding tx by clinical team. All w/o GI problems. Excl = No criteria identified</td>
<td>Setting: school or assessment room 1x/day for 1h, prior to lunch. 6 sessions. Assessment- w/in regular lunchtime, 24 trials (6 consecutive presentations w/ 4 diff. food items) per session. Food presented, after 5s, food was removed. IMB ignored. grp based on assessment &amp; baseline. NRS - If bite not accepted w/in 5s, IMB blocked by adult behind P. PG- applied to P’s jaw if bite not accepted w/in 5s Gnr probes *all conditions were non-self-feeding except during assessment sessions O: Acc, Expulsion, Disruption, Latency to Accept (in s); disruption</td>
<td>0 P’s met eating criteria during baseline. Single-item grp- M trials to criterion= 9.33 *took fewer trials than multi-item grp to reach eating criteria Multi-item grp- M trials to criterion= 16.0 Gnr probes- acc was more apparent in multi-item grp (all 3 P’s accepted at least % of bites) All P’s reached goal of eating 3 foods from each of the 4 food grps. 3 P’s now self feed &amp; 2 P’s left the school but cont to acc target foods at criterion levels at departure.</td>
<td>Small sample &amp; homogeneity of grp (all from the same school). Results may not be representative of different feeding problems. Does not account for P characteristics that influence patterns of behavior (i.e, some may be more persistent w/ IMB dependent on their hx of reinforcement) Invasive PG tx- ethical considerations Lacks follow up</td>
</tr>
<tr>
<td>Clark et al. 2020</td>
<td>To evaluate teaching instructions for parents of</td>
<td>SCED AOTA 4</td>
<td>N= 3 child-parent dyads Children Description: All M; ages 3, 4, &amp; 6; All w/ ASD dx &amp;</td>
<td>Setting: ASD day tx facility for 1h 2x/wk over 8-10 wks Tx: Baseline Training: 2</td>
<td>Parents Implementation prf:M of Baseline, phase 1, &amp; phase 2 P1’s mother = 1%, 32% &amp;</td>
<td>Small sample size &amp; homogeneity of grp</td>
</tr>
<tr>
<td>Behavior Analysis in Practice USA</td>
<td>children w/ ASD on how to implement a structured meal procedure to ↓ FS. Additional data was collected on child bite acc.</td>
<td>E4</td>
<td>mild FS. Food selectivities: P1- 3 proteins, 5 starches, 3 fruits, 3 vegetables P2- 2 proteins, 3 starches, 2 fruits, 2 vegetables P3- 4 proteins, 3 starches, 3 fruits, 3 vegetables Parent Description: 33y.o (mother to P1), 35y.o (mother to P2), 38y.o (mother to P3). All parents had bachelor’s degree &amp; English as their first language Incl= ASD dx &amp; FS; physically capable of chewing Excl= Food allergies, serious nutritional deficiencies</td>
<td>phases. 1. Written instructions &amp; video modeling- if parents did not reach mastery criterion (80% accuracy for 3x sessions) then 2nd phase was conducted 2. In vivo prompting &amp; feedback during meal blocks (if needed) Structured Meal- timer, prompts, DRA, &amp; mouth-clean checks. Parents presented 5 bites per meal block for 30 s w/ VC. If P acc bite w/in 8 s then parent reinforced After 30 s, mouth clean-checks were done Process repeats 5x. O: % of steps parents prf accurately each session, bite acc, social validity</td>
<td>95% P2’s mother= 1.5%, 72%, 95% P3’s mother= 1.7% &amp; 95% (did not need phase 2) Children’s % of bite acc: P1= 0, P2= 0% baseline, 66% phase 1, 75% phase 2, P3= 78% baseline &amp; 100% phase 1 Social validity: procedures acceptable &amp; effective</td>
<td>Lacks follow-up data Bite acc did not ↑ for all children No professional oversight for parent implementation of behavioral tx</td>
</tr>
<tr>
<td>Cosbey &amp; Muldoon 2017 Journal of Autism and Developmental Disorders USA</td>
<td>Evaluate effectiveness of family-centered feeding tx, Easing Anxiety Together w/ Understanding &amp; Perseverance (EAT-UP™) to promote food acc for children w/ ASD.</td>
<td>Mixed methods: SCED &amp; pre-post test AOTA 4 E4</td>
<td>N = 3 (M= 6-8y, ASD dx &amp; families) Incl = must live w/in 30 mi of clinic, 1 parent proficient in English, multidisciplinary ASD dx, 2-9y, no medical contraindications for oral feeding, &amp; SS IMB Excl = no criteria identified</td>
<td>Setting: in home w/ children. Frequency varied. Family created an individualized treatment plan for each child. Tx: Food characteristics (offer foods from 3 diff food groups, food variety, present PFs &amp; NPFs at each snack/meal) Dyadic communication (visual food acc hierarchy, picture menu/verbal choices for food selection) Social environment (+ reinforcement, food con goal,</td>
<td>M food acc- P1- 0% P2- 17% P3- 20% All children showed ↑ in food acc, dietary diversity, &amp; ↓ IMB BAMBI scores ↓= less problem behaviors for all P indicating improvement</td>
<td>Small # of families &amp; homogeneity of P’s reduces gnr of study to other families of children w/ ASD P2 &amp; P3’s families didn’t have learning &amp; outside support as P1’s family did while P3’s family required more coaching overall Limited time to conduct study Less consistency over tx implementation due to subjective family discretion No follow-up conducted</td>
</tr>
</tbody>
</table>
| Cosbey & Muldoon | To determine the feasibility of using a train-the-trainer model using EAT-UP (Easing Anxiety Together w/ Understanding & Perseverance) | Mixed Methods: Pre Post and SCED AOTA 4 E4 | $N = 3M$  
P1 (3y), P2 (5y), P3 (4y)  
Incl = ASD dx before 3rd birthday, expressed interest in supporting child’s IMB.  
Excl = No criteria identified | Setting: Outpt clinic in rehab hospital.  
Tx: 50min sessions 2x wk for 6 months. RBT-led parent education of mealtime plan designed by SLP & RBT of EAT-UP menu of options that had been created by the SLP & OT  
O: pre, mid, & post BAMBI, Behavioral Pediatrics Feeding Assessment Scale (BPFAS), 24hr food recall  
IMB scores improved: $z \downarrow$ by 4.0 (P1), 0.6 (P2), & 3.4 (P3).  
# of IMB improved, $\downarrow$ for all, falling from a range of 9–12 to 0–3.  
P3: $\downarrow$ in BAMBI pre to post (z: $> +3.0$ to $+.3$). BAMBI results similar for P1 & P3.  
P2: $\downarrow$ in BAMBI pre to post (z = $+1.6$, $+1.0$).  
BAMBI: All reported a $\downarrow$ freq of IMB & #.  
All reported $\uparrow$ in food variety. | Small sample size, limited grnl  
P2 could have improved more if tx lasted longer.  
No ctrl grp.  
Maturation, other therapies, etc. could have contributed to their progress.  
No follow up. |
|---|---|---|---|---|---|
| Fernand et al. | Evaluate the role of choice btwn NPFs on the food con & IMB of children w/ FS. | SCED AOTA 4 E4 | $N = 2$ (1M 7y, 1F 6y)  
ASD Dx  
Incl = active FR w/ new foods, self-feeding, follow complex instructions, vocally repeat instructions back to researcher, verbally indicate choice  
Excl = No criteria identified | Tx: P + Researcher.  
47-48 tx sessions $\leq$ 10min. Sequential tx components (choice 1, choice 2, choice 1+NRS, NRS) w/initial baseline. 3 total food sets w/ 4 different foods - 2 were continuous baselines, 1 assoc/ w/tx condition.  
Assessments: 2 pre-tx paired-choice preference assessments &2 corresponding post-tx paired-choice preference assessments  
O: acc bites, mouth clean,  
P1 (M): Baseline = ate no NPFs. During Choice 1: Ate 8/8 bites in 1st food set (containing 4 food options). Con was variable when allowed to choose from w/in sets but still showed an $\uparrow$ from baseline  
P2 (F): Ate 0 bites at baseline and during Choice 1 & Choice 2. During choice 1+NRS & NRS: cons $\uparrow$ to 8/8 bites.  
For IMB: $\uparrow$ extinction burst occurred in NRS-alone. IMB did not $\downarrow$ until implementation | Variable con for P1 in final tx phase reduces validity  
Possible differential preferences of NPFs selected (unknown if they were equally NPF)  
P2 session duration in final tx phase was longer than designated by study procedure, reducing validity  
Small sample size $\downarrow$ grnl. |
| Flanagan et al. 2021 | To further evaluate the effects of contingency modeling on consumption of target food in children with ASD & PFD by replicating & addressing some of the limitations of Fu et al. (2015). | SCED AOTA 4 E4 | N = 3M, 6y (P1), 10y (P2), 10y (P3)  
Incl = Referred for FS & IMB.  
Score of 2 on following instructions & 90% on imitation assessment on the Communication Domain of the Vineland Adaptive Behavior Skills (3rd ed).  
Excl = Oral-motor delays or medical factors causing feeding concerns. | Setting: home or clinic at university.  
Tx: Feeder, model, & P present for each session.  
P1: 3-4x 5 min sessions per day. P2 & P3: 2x 5 min sessions per day.  
6 foods for each P, 3 in A & 3 in B. 2 bites of each A or B food presented each time. Contingency offered if consumed.  
4 txs: baseline; MDRA of B foods; MDRA for both A & B; for P2 & P3 - modeling NRS; maintenance.  
O: Food acc; IMB | All improved from baseline to maintenance.  
P1: Baseline con variable. MDRA to B: con ↑ to 100% w/no ↑ in A. MDRA to A & B: con↑ to 100% for both. Maintenance: stayed at 100%.  
Almost no IMB across all phases.  
P2 & P3: Baseline - low con (<50%). MDRA to B: saw no ↑ in con for A & B. MNRS to B: P2 ↑ for A & B (75%, 83%), P3 ↑ to 100% after Modeling NRS. Maintenance: 100% con for both.  
Both - some IMB in initial tx phases but ↓ after MNRS. | Small sample size, limited grnl.  
PF offered to P1 immediately upon placing the final bite into mouth - this was not part of the plan & he held some NPFs in his mouth waiting for it.  
Age diff in P's was large. |
| Fu et al. 2015 | To investigate the effectiveness of shaping & modeling contingencies in feeding consumption for children with FS. | SCED AOTA 4 E4 | N= 2M  
9-10y, ASD dx & limited diet  
Incl = Able to follow multi-step directions, imitate others, & verbal.  
Excl= Hx of feeding therapy | Tx: Identified 6 NPFs & divided into grps A & B.  
Tx phases:  
1st- Modeling;  
2st- MDR;  
3rd- MDR & NRS; Final phase- MDR & NRS w/ Food Grps A & B  
Tx implemented by 1 model, 2 feeding therapists, & ABA | Avg. % of intervals w/ IMB:  
P1- Grp A: (6.19, modeling), (8.23, MDR), (1.39 for MDR & NRS); Grp B: (19.49, modeling), (8.59, MDR), (4.94, MDR & NRS).  
P2- Grp A: (22.57, modeling), (35.72, MDR), (0.69 MDR & NRS); Grp B: (4.05 modeling), (0.99, MDR), (0.04 MDR & NRS). | Small sample size & heterogeneity of sample limits grnl.  
Session duration was not consistent across conditions raising concern of whether behavior change was due to MDR & NRS or longer access to tx foods.  
Effects of MDR (w/o NRS) |
| Gast et al. 2020 USA | Evaluate effects of a multicomponent tx in addressing FS in preschoolers w/ developmental disabilities. Specifically aimed at ↑ con of NPFs | SCED AOTA 4 E4 | grad students 3-4 sessions w/ 10 min breaks in/btw, 2x/wk O: ↓ IMB & ↑ con | Con for both P’s remained at 0 w/ Grp B until MDR & NRS were implemented, at which time con ↑ to 100%. | were not eval. w/ grp B, thus there is limited info about effectiveness of MDR alone. Results may be based on types of food presented (i.e., some foods more disliked than others) rather than modeling procedures. Paired-choice preference assessments may not be best measure to evaluate NPFs. Lacks follow up |

**Summary:**
- **Methodology:**
  - Study design: Randomized controlled trial
  - Setting: Preschools in SE US
  - Sample size: N = 3 (1F 3y, 2M 4y)
  - Inclusion criteria: ASD (2), sig. DD & Speech-Lang. Impairment (1)
  - Exclusion criteria: No criteria identified
  - Intervention: 2 preschools in SE US. 1 tuition/community based, 1 stated funded SPED program
  - Treatment duration: 3-6 MEE
  - Treatment type: Multicomponent

**Intervention Details:**
- **Setting:**
  - Classroom environment

**Outcome Measures:**
- **Outcome Measures:**
  - Eating behaviors: touch, smell, taste, eat
  - Target IMB (1 P): refuse, expel, gag, physical escape

**Results:**
- **Results:**
  - Original tx pkg = no ↑ NPF eaten for any Ps
  - P1: After MEE: target behaviors learned & mastery criterion achieved. ↑ in food con and ↑ in food variety from 3-6 post-tx
  - P2: After MEE and modified instruction added: Touch, taste, & smell criterion reached. Eat criterion not reached. as the participant ate 1 NPF during tx, but did not maintain con of new food post-tx
  - P3: After MEE and modified instruction added: Touch, taste (w/fork), & smell criterion reached during tx with ↓ in IMB. However, IMB ↑ in eat condition. Eat criterion not reached. Anecdotal report of one new food added to diet post-tx.
### Effectiveness of Feeding Therapy Approaches on Consumption in Children

<table>
<thead>
<tr>
<th>Year</th>
<th>Study Description</th>
<th>Authors</th>
<th>Condition</th>
<th>Sample Size</th>
<th>Intervention</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Evaluate effects of video modeling on FS of children w/ ASD</td>
<td>Hillman</td>
<td>AOTA 4</td>
<td>N = 3 (F 4y, M 3y, M 4y)</td>
<td>Tx: P+VM+feeder+parents. 4 at-home sessions/wk, 30 min. each, at dinner. 1 session = 5 presentations NPF plate w/ 5 bites of 2 NPF on it. 8 sessions per VM condition followed by 8 sessions of VM+R. Follow-up probes for each NPF for 5mos. O: acc, con</td>
<td>Small sample size limits gnrl</td>
</tr>
<tr>
<td>USA</td>
<td></td>
<td></td>
<td>E4</td>
<td>Incl = Parent report of FS, not receiving tx for FS, parental consent for tx done in home, able to communicate in full sentences &amp; ind express FPss &amp; dislikes, no physical problems related to eating, no hx of medical tx for FR Excl = No criteria identified</td>
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<tr>
<td>2017</td>
<td>Utilized DRA &amp; shaping to † food variability &amp; food acc in children w/ ASD dx &amp; FS</td>
<td>Hodges</td>
<td>AOTA 4</td>
<td>N = 2 (1M, 1F), 7 &amp; 8y/o, ASD dx, significant FS</td>
<td>Tx: DRA &amp; shaping O: food variety of &amp; # of foods consumed &amp; food acc by children w/ ASD</td>
<td>Small # of P &amp; no control grp = lack of gnrl</td>
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<tr>
<td>USA</td>
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<td>E4</td>
<td>Incl = present feeding problem was FS, had identifiable PF items to use as reinforcement, &amp; had approval from P’s pediatrician Excl = no underlying medical conditions contributing to feeding difficulties &amp; no concern of compromising medical issues impacting tx feeding safety</td>
<td></td>
<td>Trials limited to clinical setting = not a natural setting familiar to P</td>
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<td>Baseline: no food con for both P Tx: both P showed † in food acc &amp; variety, each acquiring 4 new foods in short time period (avg 10 trials) Graded approach allowed P to † comfort w/ food before con † time for food con indicating feeding response improvement</td>
<td>Both P shared similar age &amp; language abilities, therefore difficult to determine if similar tx is beneficial for children of different ages &amp; developmental levels</td>
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<td>P3s follow-up probe had parent-initiated modification which could have affected results</td>
<td>No follow-up conducted</td>
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</table>

**Notes:**
- † indicates significant improvement.
- NPF = Natural Parental Feeding.
- VM = Video Modeling.
- FS = Feeding Safety.
- ABA = Applied Behavior Analysis.
- SCED = Special Children's Educational Directory.
| Koegel et al. | To expand on current research using multiple P's & to assess whether FS & restrictiveness could be modified in children w/ASD through the use of an individualized reinforcement & stimulus fading program. | SCED AOTA 4 E4 | N = 3M (P1, P2, P3) 6.4-7.8y, ASD dx, referred to an ASD tx center for tx services. Incl = the recurring presence of IMB; desire of parent/caretaker to improve meal time FS. Excl = No criteria identified | Tx: New foods offered: P1 – 8; P2 – 25; P3 – 25. Baseline - parent presented foods as they normally would, offered it 3x. 7 levels of acc & each time food offered the acc level ↑ Stimulus fading= imperative for reaching ind goal level each time. Stopped at 22wks or when 15 new foods were tried. O: # of new foods acc, spontaneous requests for new foods, modal/representative comments, & level of acc of each food item. No P's acc new foods at baseline. New foods acc at end of tx: P1 (5), P2 (9), P3 (8) New foods acc at follow-up/gnrl: P1 (6). P2 (15). P3 (16). All spontaneously requested new foods post-tx & did not at baseline. Modal/representative comments shifted from negative at baseline to more + during tx. | Small sample size. Different # of foods offered for each P. |
| Levin & Carr | Examine the differential effects that tx efficacy has on the individual’s access or lack thereof of PFs prior to tx w/ presence or absence of a + reinforcement impacting NPF eaten | SCED AOTA 4 E4 | N = 3 (2M, 1F, 5-7y, ASD dx) Incl= met DSM-IV criteria for ASD & had FS issues, screened diets to determine whether FS issues warranted need for tx Excl = No criteria identified | Setting: classroom 30 min training meals up to 3x until food con by child Portions ↑ as child continued to eat the food throughout tx Premack-based tx (HPF given if NPF eaten first) Tx 1: Condition A: Access to PF prior to training meal & no contingency during training meal Condition B: No access to PF & no contingency during training meal Condition C: Access to PF prior & contingency offered | Tx 1: ↑ food con in Condition D & ineffective in ↓ IMB for all P Positive reinforcement was effective in ↑ food acc, variety, and con of NPFs All P ate ↑ NPFs when they didn’t have PFs beforehand & were given PFs after Tx 2: All P ↑ food con in Condition D & ↓ IMB overall | Small # of P’s= lack of gnrl problems. Stimulus fading on NPF - not systematically examined, therefore it’s uncertain stimulus fading was an important component of tx Stimulus fading= not ideal for children needing hospital care b/c of physiological problems resulting from FS No follow-up conducted |
| Study Reference                          | Country                         | Methodology                                                                 | Participants                                                                 | Condition: No access to PF prior & contingency offered                                                                 | Tx 2: Condition A & D only                                                                 | O: IMB, GC, # of foods consumed                                                                 | Tx 4: P+VM+feeder. Post-mastery probe = Food A at 80% & Food B at 100%. | Small sample size limits generalizability. Only assessed P’s w/ cognitive ability to learn VM procedures. | No LT maintenance data. P’s did not have exposure to VM of DR/NRS + DR condition, so effects unknown. | No comparison of VM to in-vivo modeling or to DR alone. | No identified function of IMB. |
|----------------------------------------|---------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| O'Connor et al. 2020 Behavioral Interventions United Kingdom | Evaluate the effectiveness of video modeling contingencies alone & combined w/ direct exposure to the contingencies in the tx of FS | SCED AOTA 4 E4                                                               | N = 3 M (5y, 10y, & 12y)                                                                 | Dx of ASD, no previous tx’s to ↑ con OR previous tx ineffective.                                                                 | Incl = Normal height & weight, no physical problems related to eating, no hx of medical tx for health issues associated w/ FR, can communicate in full sentences & independently express wants & needs, score of at least 75% on all VM prerequisite skills assessments, parent desire to ↑ novel food con Excl = No criteria identified | Tx: P+VM+feeder. Sessions lasting 1-10 min., held 1-3x per wk in P homes. 1 session = five trials of one bite of target food. Efficacy of VM, VM of DR, VM of DR plus DR, & VM of DR/NRS plus DR, assessed sequentially if food con did not ↑ Mastery criterion = acc & con in 100% of trials in 3 consecutive sessions. At least 3 sessions per condition were conducted. Gnlr probes at pre/post tx conducted w/ novel person. O: Food acc, con, IMB, social validity (completed by parents) | P1: ↑ Con of 2/2 NPF w/ VM of DR + DR. Post-mastery probe = Food A at 80% & Food B at 100%. P2: ↑ Con ½ NPF w/ VM of DR + VM of DR and DR. Post-mastery probe = Food A & Food C at 100%. Food B never consumed P3: ↑ Con of Food A occurred w/ VM. ↑ Con of Foods B & C w/ VM of DR + DR. Post-mastery probe = Food A & B not maint, Food C at 100% Gnlr probes:: P1 - Food A & Food B ↑ 0% to 60% & 0% to 100%. P2 - Food A & Food C ↑ 0% to 80% & 0% to 100%. P3 - Food C ↑ 0% to 100% and Food A ↓ to 0%. For P2 & P3 Food B at 0% Social validity: procedures acceptable & effective | | | |
| Penrod et al. 2010 Behavioral Interventions | Conduct a sequential component analysis of the effects of: Bite fading, | SCED AOTA 4 E4                                                               | N = 3 parent-child dyads (3M 3-4y)                                                                 | Dx: ASD (2), PDD (1) Incl = 2-6y, engage in IMB                                                                 | Tx: P+parent (feeder). Paired-choice preference assessment for 6 PF, 6 target foods & 7-8 NPFs for gnlr probes. | P1: Through Phase 2: 0 NPFs swallowed. Con ↑ in Phase 3: terminal goal of 51 bites swallowed. Gnlr: some con of NPFs. IMB: ↑ 100% avg to 2% at follow-up | Hx of early tx services not consistent across P’s. Potential differential effects of PF as reinforcers for each P | | | | | |
### EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN

<p>| USA | manipulation of reinforcer magnitude, &amp; escape prevention on con in children w/ IMB &amp; FR. | when asked to eat new or NPF, eating &lt; 5 foods (not including snacks or sweets), refusing foods from at least 1 of the food grps, be weaned from the bottle or breast milk, no signs of an immediate family hx of maladaptive eating patterns or eating disorders, 1 parent willing to take on therapist role throughout whole study | DRA+Escape baseline: 3 NPFs presented w/ 3 step prompt sequence, PF reinforcement w/ swallow. If IMB occurred or no acc w/in 5 s of physical prompt, 30s escape allowed. Phase 1: DRA+Escape+Bite Fading. Baseline procedure w/150% ↑ in bite requirements after acc of NPF for 3 meals in a row. Phase 2: DRA+Escape+Bite Fading+Reinforcer manipulation: Above procedure w/reinforcement thinning &amp; end dessert reward. Phase 3: DRA+Bite Fading+Reinforcer manipulation+Escape prevention: Above w/NRS. O: Acc, GC, mouth clean IMB, parent administration behaviors. P2: Through Phase 2: 0 NPFs swallowed. Con ↑ in Phase 3: terminal goal of 51 bites swallowed. Gnrl: All bites of NPFs con mid-way through phase 3, IMB: ↓ 100% avg through phase 2 to 1% at follow-up. P3: DRA+Escape baseline: 0 NPFs swallowed. Phase 1: 1 NPF swallowed. Cons ↑ in Phase 2: Terminal goal of 21 bites swallowed. Gnrl: Phase 2 results maint. IMB: ↓ 100% avg thur phase 1 to 0% at follow-up. # of GC ↑ baseline to follow-up. Satisfaction: 100% post tx, 95-100% post-follow-up. IMB report may not have captured tx intensity. Small sample size limits gnrl. |</p>
<table>
<thead>
<tr>
<th>Penrod et al. 2012</th>
<th>Evaluate effects of HPS combined w/ LPS demand fading in treating FS in two boys exhibiting active FR</th>
<th>SCED AOTA 4 E4</th>
<th>N= 2M (9 &amp; 10y) w/ ASD dx, FS lx</th>
<th>Setting: therapist conducted tx in lab. 4 sessions 60 min 2-3 days/wk. Each session= 12 trials w/ 3 instructions/1 targeted food x4</th>
<th>For both P compliance remained at 0 during baseline</th>
<th>HPS &amp; demanding fading= ↑ compliance when preceding LPS</th>
<th>LPS- compliance ↓; required remedial phase compliance= 100% &amp; stayed ↑ for tx remainder</th>
<th>C/S all 4 foods- compliance &amp; con= 100%; ↑ food consumption, not dependent on trainer</th>
<th>Follow-up conducted at 3, 6, &amp; 12 weeks post tx</th>
</tr>
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<tbody>
<tr>
<td>Peterson et al. 2016</td>
<td>Compare tx outcomes of modified SOS &amp; ABA approach to FS</td>
<td>SCED AOTA 4 E4</td>
<td>N = 6M (4-6y), ASD dx 4 had received early tx for btw 3-15 months, none had prior feeding therapy Incl = # of foods consumed &lt;20 but &gt;3, 90% caloric needs by mouth, safe oral feeders, oral-motor skills to chew table food Excl = Untreated medical conditions, not maint growth according to own curve, &lt;90% caloric needs by mouth</td>
<td>Tx: P+feeder Random paired assignment to ABA or M-SOS. 1.5 hr outpt. appt., 3x/wk, min. 12 session requirement. If &gt;80% con reached for one tx, 3 additional sessions conducted for other tx ABA: Baseline = 5-bite, timed presentation using spoon w/ direction to take bite &amp; praise for mouth clean. Tx = NRS w/HO/H guidance. If unable to maint spoon touching lips for 3s, NRS by therapist M-SOS: Baseline: Bite placed ABA: &gt;80% acc &amp; mouth clean for first food exposed to tx P1: ↑ from baseline: Acc (M: 22 to 97%) &amp; GC (M: 0.5 to 2). ↓ from baseline - IMB/min (M: 19 to 1). M mouth clean 97% at baseline, 98% during ABA M-SOS: Baseline: Bite placed P2: ↑ from baseline: Acc (M: 1 to 94%) &amp; GC (M: 0.01 to 2). ↓ from baseline - IMB/min. (M: 6 to 1). M mouth clean 100% at baseline, 100% during ABA</td>
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<td>Imbedded baseline approach, targeted outcomes, &amp; methodology of M-SOS approach not in alignment w/ tx priorities of SOS For ABA condition, tx individualized extensively for P3 rather than strict adherence to protocol</td>
</tr>
</tbody>
</table>

**EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN**
<table>
<thead>
<tr>
<th><strong>Peterson et al.</strong>&lt;br&gt;2019&lt;br&gt;USA</th>
<th><strong>EFFECTIVENESS</strong>&lt;br&gt;Behavioral interventions</th>
<th><strong>Two-group non-randomized studies</strong>&lt;br&gt;AOTA 2B E3</th>
<th><strong>N = 6 (3-10y), ASD dx</strong>&lt;br&gt;Incl = identified as safe oral feeders w/ oral-motor skills to manage table-textured foods, consume less than 20 but more than three foods by mouth, age 3-10y, consume at least 90% of caloric needs by mouth, weight-for-height at or &gt;5th percentile, nutritionally deficient diet&lt;br&gt;Excl = receiving feeding-related tx from another therapist, dx requiring medical tx that would interfere w/feeding tx</th>
<th><strong>Tx: P+feeder. P’s assigned to tx or waitlist ctrl. 1.5 hr appts. 1x per wk (2 P’s 3x per wk, 1 P 1x every other wk). General procedure: 4 foods per session (4 bite presentations), w/ descriptive praise for acc at 30 s &amp; descriptive praise for mouth clean. No differential consequences for coughing, gagging, IMB, or vomiting. ABA tx: HOH guidance w/ NRS if no ind acc w/in 8 s of presentation. Re-presentation until bite remained in mouth for at least 3 s. Session cont. until 4 bites swallowed or 10 min elapsed.</strong>&lt;br&gt;O: Ind acc, mouth clean, &amp; IMB</th>
<th><strong>P3: ↑ from baseline: Acc (M: 0 to 100%) &amp; GC (M: 0 to 2.2). ↓ from baseline - IMB/min. (M: 16 to 1). M mouth clean 0% at baseline &amp; 100% during modified ABA</strong>&lt;br&gt;M-SOS: No ↑ in acc or mouth clean&lt;br&gt;ABA for P’s originally in M-SOS: &gt;80% acc &amp; mouth clean&lt;br&gt;1 P in ABA condition required procedural modification (backward chaining) before acc/mouth clean ↑&lt;br&gt;Caregiver satisfaction w/ tx not assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pizzo et al.</strong>&lt;br&gt;2009&lt;br&gt;Behavioral interventions</td>
<td><strong>E3</strong>&lt;br&gt;SCED AOTA 4 E4</td>
<td><strong>N = 3M (4y, 5y, 9y)</strong>&lt;br&gt;Chris (5y): GI reflux dx w/ FS for type &amp; texture. # of foods in Diet Prior to tx: 18</td>
<td><strong>Setting: tx rooms at feeding program.</strong>&lt;br&gt;<strong>Tx: Probe meals- conducted by parents prior to tx &amp; during tx to measure changes in con</strong>&lt;br&gt;<strong># of foods reported in diet at 1-mo follow-up:</strong>&lt;br&gt;Teddy, 55; Chris, 59; Sam, 72 &lt;br&gt;<strong># of bites across tx course:</strong>&lt;br&gt;Teddy, &gt;15; Chris, &gt;20; Sam, &gt;10</td>
<td><strong># of foods reported in diet at 1-mo follow-up:</strong>&lt;br&gt;Teddy, 55; Chris, 59; Sam, 72 &lt;br&gt;<strong># of bites across tx course:</strong>&lt;br&gt;Teddy, &gt;15; Chris, &gt;20; Sam, &gt;10</td>
<td>Small sample size &amp; heterogeneity of grp limits ability to make gnrl&lt;br&gt;Short study (4-5 days of tx)</td>
</tr>
</tbody>
</table>
| USA | traditional outpatient tx. | Teddy (9y): ADHD dx. # of foods in diet prior to tx: 23  
Sam (4y): ASD dx. # of foods in diet prior to tx: 23  
Incl= All children did not have success w/ outpatient tx or in-home tx for at least 3 months prior to study.  
Excl = No criteria identified | Sam, M= 14; Chris, M= 14;  
Avg # of IMB per wk ↓;  
O: Change in # of foods con, # bites, IMB | Results lack SS power |
|---|---|---|---|---|
| Seiverling et al.  
2018  
Journal of Autism & Developmental Disorders  
USA | To evaluate the effectiveness of a behavioral feeding tx w/ & w/o the incl of SIT to expand the diet variety of 2 children w/ ASD & FS, & to evaluate whether the incl of SIT would enhance the effectiveness of the behavioral feeding tx. | SCED AOTA 4 E4 | N = 2M (P1 & P2)  
Non-verbal, ASD dx, 5-6y  
Incl = Child Sensory Profile-2 score indicating impaired sensory processing  
Excl = No criteria identified | Bite/drink con improved: P1 - ↑ from <25% to >90%. P2 - <40% to >90%. Both w/ & w/o SIT.  
IMB improved: P1 - >80% to <20%. P2 - 60% to <20%. Both w/ & w/o SIT.  
GC: Both ↑ across both tx.  
Follow-up: P2 continued to eat similarly to end of tx. | P1 could not attend follow-up, unknown LT effectiveness of tx  
Small sample size, limited grnrl.  
P1’s SIT could have carried over for later sessions.  
Integrity data on implementation was not taken (not done by OT trained in SIT).  
SIT not done in an OT clinic, lacked materials. |
| Sharp et al. 2019  | To evaluate the feasibility & preliminary efficacy of a structured multidisciplinary tx in children w/ ASD & moderate FS. | RCT AOTA 1B E2 | N = 38 (32M, 6F; 38 - 88 months)  
Attrition <10%  
Incl = 3-8y; ASD dx; live w/ 1+ caregivers who can read & speak English; moderate FS; parental report of FS w/persistent FR behaviors when presented w/ NPFs as primary clinical concern  
Excl = medical condition requiring specialized diet; medical problems like aspiration & upper airway obstructions; severe FS (complete rejection ≥ 1 food grps) | Tx at multidisciplinary feeding disorders program in SE US  
16wk MEAL. 10x 90min grp sessions over 12wks + 3 booster sessions. Partial child involvement starting at session 5.  
OR  
Parent Education Program (PEP). 10x 90min sessions. No child involvement.  
O = Global Impression - Improvement Scale (CGI-I) & BAMBI.  
Secondary measure: GC during 10min meal observation of food historically rejected by P. | More + results for MEAL than PEP.  
+ response rates at wk 16 on CGI-I: 47.4% for MEAL & 5.3% for PEP (P < .05)  
BAMBI: MEAL improved, SS lower, w/adjusted standard M diff of 6.15 (2.25) (P = .01) at wk 12 & 7.04 (2.71) (P = .01) at wk 16.  
GC during meal observation ↑ both times in MEAL, w/adjusted standard M diff of 30.76 (6.75). More GC by MEAL at wk 16 (P = .001).  
GC ↓ each time for PEP.  
15/19 from MEAL did wk 20 follow-up. CGI-I - no change from wk 16 levels for 12. 2 rated as minimally improved at wk 16, made gains & rated as much improved at wk 20. | Reliance on parents who were not blinded.  
No standardized measure of dietary variety looked at for predictors of response.  
3-day food diary taken at beginning but not at end to measure variety.  
Small sample size prevents drawing definitive conclusions about efficacy. |
<table>
<thead>
<tr>
<th>Silbaugh &amp; Swimnea</th>
<th>To assess the gnrl of HPS effects on feeding in children w/ ASD &amp; FS &amp; expand prior research through extensive pretreatment assessments to meet EBP standards in special education</th>
<th>SCED AOTA 4 E4</th>
<th>N = 3 (2M, 1F, 4-6y, ASD dx)</th>
<th>Setting: home or in school classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 Behavior Modification USA</td>
<td>Incl= no criteria identified except for ASD dx</td>
<td></td>
<td>Excl= medical conditions associated w/ feeding issues (C/S) suspected by parent or feeder</td>
<td>Tx 1: LPS, 30min</td>
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<tr>
<td></td>
<td>Excl= medical conditions associated w/ feeding issues (C/S) suspected by parent or feeder</td>
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<td></td>
<td>Tx 2: HPS; delivered LP demand contingent on clean mouth; bite of HPF delivered based on compliance w/ HP &amp; LP mealtime demand</td>
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<td>O: food acc/con &amp; compliance</td>
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<td>P1- ↑ # of foods con (21 foods); displayed contact, bite, &amp; C/S compliance</td>
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<td>Unable to replicate previous positive results of HPS on improving feeding responses</td>
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<td>P2- ↑ # of foods con (6 foods); displayed contact &amp; bite compliance</td>
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<td>Ran only a few sessions per P</td>
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<td>P3- ↑ # of foods con (45 foods); displayed some contact, bite, &amp; C/S compliance</td>
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<td></td>
<td>Characteristics of tx intensity should have reinforced # of trials w/in sessions</td>
<td></td>
<td></td>
<td>Diff in how HPS was conducted for all P</td>
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<td>Findings possibly attributable to ID of 1 or more boundary conditions of tx where HPS isn’t effective or gnrl &amp; low tx integrity</td>
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<td>No follow-up conducted</td>
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<tr>
<td>Turner et al.</td>
<td>Evaluate use of shaping package for improving food acc &amp; con for children w/ ASD dx while comparing presentation of small, constant food sets vs. large, rotating food sets</td>
<td>SCED AOTA 4 E4</td>
<td>N = 2M (6y, white, ASD dx)</td>
<td>Researcher conducted tx in clinic 2x day, 1x per session (2x)</td>
</tr>
<tr>
<td>2020 Research in Developmental Disabilities USA</td>
<td>Incl= demonstrated FS based on parent report, ASD dx, 2.5-8y, receipt of behavioral services in home or clinic, self-feeding, &amp; follow 1 to 2 step instructions</td>
<td></td>
<td>Excl= medical condition associated w/ eating, vision or motor impairment, or currently receiving related tx</td>
<td>Researcher + P + P’s regular therapist</td>
</tr>
<tr>
<td></td>
<td>Excl= medical condition associated w/ eating, vision or motor impairment, or currently receiving related tx</td>
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<td>Tx 1: small food set (same 3 foods/session), if food not eaten then + encouragement given; 1 trial modeling given by researcher</td>
</tr>
<tr>
<td></td>
<td>O: ↑ food eaten &amp; acc</td>
<td></td>
<td></td>
<td>O: ↑ # of foods interacted w/ through senses</td>
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<tr>
<td></td>
<td>P1: Small food set- interacted with 2 foods</td>
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<td></td>
<td>P1: Small food set- interacted with 2 foods</td>
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<td></td>
<td>Large food set- interacted &amp; con 10 foods</td>
<td></td>
<td></td>
<td>Large food set- interacted w/ 3 foods &amp; con 1 food</td>
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<tr>
<td></td>
<td>P2: Small food set- interacted w/ 3 foods &amp; con 1 food</td>
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<td></td>
<td>Large food set- interacted w/ 17 foods</td>
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<td>Both Ps ↑ # of foods acc &amp; con indicating improvement</td>
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<td>Variability in success: P1 ate many different foods w/ an M time/food eaten= &lt; 20 min, P2 ate 1 food &amp; given 9 hrs of tx</td>
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<td>Multiple procedural variations: combining tx for two tiers (taste &amp; lick), adding an additional tier for both P’s &amp; modified tx after vomiting</td>
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<td>Discontinued large set condition (due to time constraints); continued modified small set condition for final 12 sessions = continuing could have resulted in behavior change</td>
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<td>No formal assessment of food acc improvement w/ untrained implementers in different contexts</td>
<td></td>
<td></td>
<td>No formal assessment of food acc improvement w/ untrained implementers in different contexts</td>
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</tbody>
</table>
| Author(s)          | Title                                                                 | N= | Setting                                                                 | Tx: Prevention of eating for 2h before target meal | Preference assessment conducted during dinner, 2-3x/wk to determine NPF & HPF. 2 conditions: 1. Simultaneous- 1 bite of NPF placed on top HPF 2. Sequential- 1 bite of HPF contingent on acc 1 bite of NPF Both conditions, if meal went unfinished, parent asked to wait 1-2h before giving child other meal *gmr probes conducted during each tx phase. Then, presentation method + EE (NRS procedure & bite fading); Followup conducted 2, 4, 6, & 12 wks after tx | O: # of times each food was selected & con | P1: # of bites ↓ to 3. maint 100% con w/an FR 21 schedule of reinforcement when HNPF was replaced w/NPF. In-home: P1 had 90% con w/o expulsion during gmr probes. P2: 85%-100% con w/o expulsion w/FR21 schedule of reinforcement. In-home: P2 maint 100% con w/o expulsion in all follow-up sessions. Gnr probes ranged from 55-100% con w/o expulsion. | Small sample size & heterogeneity of grp
Uses different procedures from similar studies, so unable to do direct comparisons
Lack of ctrl in food types pairing process could have influenced effectiveness of simultaneous presentation
HPF were not faded, making it hard to tell if con of target foods would have maint in absence of HPF |
|-------------------|----------------------------------------------------------------------|----|-------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VanDalen et al.   | A comparison of sequential & simultaneous food presentation in the tx of FS. | 2M | Setting: research room first & then in-home.                           | Tx: Prevention of eating for 2h before target meal | Preference assessment conducted during dinner, 2-3x/wk to determine NPF & HPF. 2 conditions: 1. Simultaneous- 1 bite of NPF placed on top HPF 2. Sequential- 1 bite of HPF contingent on acc 1 bite of NPF Both conditions, if meal went unfinished, parent asked to wait 1-2h before giving child other meal *gmr probes conducted during each tx phase. Then, presentation method + EE (NRS procedure & bite fading); Followup conducted 2, 4, 6, & 12 wks after tx | O: # of times each food was selected & con | P1: # of bites ↓ to 3. maint 100% con w/an FR 21 schedule of reinforcement when HNPF was replaced w/NPF. In-home: P1 had 90% con w/o expulsion during gmr probes. P2: 85%-100% con w/o expulsion w/FR21 schedule of reinforcement. In-home: P2 maint 100% con w/o expulsion in all follow-up sessions. Gnr probes ranged from 55-100% con w/o expulsion. | Small sample size & heterogeneity of grp
Uses different procedures from similar studies, so unable to do direct comparisons
Lack of ctrl in food types pairing process could have influenced effectiveness of simultaneous presentation
HPF were not faded, making it hard to tell if con of target foods would have maint in absence of HPF |
| 2010 Behavioral Interventions USA | SCED AOTA 4 E4 | N= | Setting: research room first & then in-home.                           | Tx: Prevention of eating for 2h before target meal | Preference assessment conducted during dinner, 2-3x/wk to determine NPF & HPF. 2 conditions: 1. Simultaneous- 1 bite of NPF placed on top HPF 2. Sequential- 1 bite of HPF contingent on acc 1 bite of NPF Both conditions, if meal went unfinished, parent asked to wait 1-2h before giving child other meal *gmr probes conducted during each tx phase. Then, presentation method + EE (NRS procedure & bite fading); Followup conducted 2, 4, 6, & 12 wks after tx | O: # of times each food was selected & con | P1: # of bites ↓ to 3. maint 100% con w/an FR 21 schedule of reinforcement when HNPF was replaced w/NPF. In-home: P1 had 90% con w/o expulsion during gmr probes. P2: 85%-100% con w/o expulsion w/FR21 schedule of reinforcement. In-home: P2 maint 100% con w/o expulsion in all follow-up sessions. Gnr probes ranged from 55-100% con w/o expulsion. | Small sample size & heterogeneity of grp
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Lack of ctrl in food types pairing process could have influenced effectiveness of simultaneous presentation
HPF were not faded, making it hard to tell if con of target foods would have maint in absence of HPF |
|  | | FS & ASD dx; 4 & 5y | | | | | | |
|  | | Initially P1 ate 4 foods: pancakes, scrambled eggs, cheerios, & spanish rice. HPF included: crackers, chips & cookies. P2 ate only french fries, fruit snacks, & potato chips. | | | | | |
|  | | Incl= FS not related to a medical or physiological condition, eating <5 foods &/or refusing foods from at least 1 of the major food grps | | | | | |
|  | | Excl = No criteria identified | | | | | |

Small sample size & heterogeneity of grp
Uses different procedures from similar studies, so unable to do direct comparisons
Lack of ctrl in food types pairing process could have influenced effectiveness of simultaneous presentation
HPF were not faded, making it hard to tell if con of target foods would have maint in absence of HPF
<table>
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<tr>
<th>Outcomes</th>
<th>Galpin et al. 2018 Frontiers in Education United Kingdom</th>
<th>To address FS across a sample of children attending a primary school for pupils w/ ASD &amp;/or profound &amp; multiple learning difficulties.</th>
<th>Single Group Pre-Post AOTA 3B O4</th>
<th>N = 19 (3F, 16M; 4-10y M = 6y 5 month) Dx of ASD, minimally verbal, &amp; have communication difficulties. No physical complications &amp; all have oral motor skills to eat. Attended government funded school in inner-city London. All have a Statement of Special Education Need (SEN) or an Education, Health, &amp; Care Plan. Selected following recommendation from teacher, parent, &amp; therapist assessment of need for a FS tx. Excl = if missed more than 25% of sessions.</th>
<th>Tx: SOS Approach 12 wk tx at designated snack time w/ sensory preparation games &amp; activities prior. Given to whole classroom by school staff. 52 foods, 3 liquids, 5 sauces w/ 4-8 available during each session Food presented in clear plastic bag &amp; tray for unwanted food to be placed O: BAMBI, food variety Overall BAMBI scores improved &amp; were SS lower post n(18) = 4.66, p &lt; 0.001, d = 1.07 FS improved, SS lower post n(18) = 5.06, p &lt; 0.001, d = 1.16 FR improved, SS lower post n(18) = 3.18, p &lt; 0.005, d = 0.73 Severity scores improved, SS lower post Z = -3.00, p &lt; 0.001, r = -0.49 IMB improved, SS lower post Z = -2.46, p &lt; 0.05, r = -0.4 17/19 P’s tried ≥ 1 new category of food. 2 tried all pre &amp; post.</th>
<th>Systematic desensitization impact unclear. Lacked baseline ctrl period Children may have been averse to foods due to being new &amp; not a sensory quality. Relatively small sample size Heterogeneity of sample makes gnrl difficult. No individual sensory profiles given. School staff involved creates potential experimental bias. Limited IOA measures.</th>
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<td></td>
<td>Miyajima et al. 2017 Hong Kong Journal of Occupational Therapy China</td>
<td>Evaluate effectiveness of newly designed program to provide information to parents about factors of PFs &amp; approaches for coping w/ FS for children w/ ASD dx.</td>
<td>Single Group Pre-post AOTA 3B O4</td>
<td>N= 23 parents w/ 19 children w/ ASD dx &amp; 4 children undiagnosed (18M, 5F, 3-6y) Incl= parent attended all programs in study (2 sessions, 2 discussions), child w/ ASD dx or scored more than 15pts on SCQ, &amp; experienced difficulties w/ child’s FS Excl= children w/ hospital admission, changed to a new tx</td>
<td>Tx: Session 1- focused on factors &amp; approaches of FS for parents to use w/ children, basic attitudes, IMB &amp; parental approaches in addressing them at home Tx: Session 2- have parents share outcomes (successful/unsuccessful) of tx implementation at home O: food acc &amp; parental After both tx sessions, ↑ # of approaches by parents lead to ↑ food acc # of unacc foods ↓ &amp; ↑ parental self-efficacy Overall indicating improvement in all P feeding responses</td>
<td>No operational FS definition No significant change in # of foods acc for children Only ST improvements in quality of life for parents &amp; children Many parents had difficulty following FS improvement recommendations w/ children &amp; could be beneficial to have parental involvement early on in tx</td>
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<tr>
<td>Study</td>
<td>Design/Methodology</td>
<td>Outcome(s)</td>
<td>Results/Findings</td>
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<td>Seiverling et al. 2012 Journal of Applied Behavioral Analysis USA</td>
<td>To examine the effects of BST on parent implementation of a FS tx pkg that consisted of repeated taste exposure, EE, &amp; fading. Other aims included providing an operationalized training procedure for parents for in-home implementation &amp; to examine the effects of tx on children's behavior.</td>
<td>N= 3M, mother-child dyads ASD dx &amp; FS; 4y, 8y, 5y; eval at hospital-based feeding clinic Mothers: 33y, 40y, 41y; 2 homemakers &amp; 1 special ed teacher. Incl= unsuccessful attempts at implementing a home-based plan to ↑ acc of NPFs. Excl = No criteria identified</td>
<td>Tx: Baseline taste sessions-w/ written instructions; 20 taste sessions per day by parent via written instructions Parent-fed baseline probe meals- after every 10 taste sessions Parent training- incl modeling, rehearsal, feedback. Training complete when parent correctly performed an avg of 90% of steps during assessment Posttraining - same as baseline Follow-up- weekly for 3wks O: Parent behavior, (% of correct steps performed) child’s ↑ in diet variety &amp; ↓ in IMB Mastery criteria=eating 3 half-spoonful bites w/in 30 s w/o IMB All mother’s results: Baseline prf for taste sessions = &lt; 50% avg; Baseline prf for probe meals (no EE) = avg 70%. All parents rated effectiveness of BTS pkg as excellent &amp; FS tx as very good. All mothers rated their children’s behavior during mealtimes post tx as good. Each child showed ↑ in bite acc w/in 30 s &amp; ↓ in IMB during posttraining. 3 mo Follow-up: 2 children continued to make gains &amp; 1 child ate fewer foods than at 1mo follow-up but continued to eat foods rather than only fluids as in pre-tx</td>
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<td>Sharp et al. 2013 Autism: The International Journal of Developmental Disabilities USA</td>
<td>To describe &amp; evaluate the Autism MEAL Plan</td>
<td>N= 30 (Attrition N = 11) 19 children; 15M, 4F. Incl= ASD dx; 3-8y; Have to have a Social Responsiveness Scale (SRS) score in the mild, moderate, TX: Pre tx- Assessment battery then even random assignment to tx condition (MEAL plan) or to waitlist ctrl Tx grp participated in 8-wk educational High degree of social validity &amp; + statements from parents for MEAL plan. Efficacy Outcomes: Caregivers in tx grp</td>
<td>Results lack statistical power Timeframe of measurement Lacked a training manipulation check</td>
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<td>Research and Practice USA</td>
<td>or severe range. Excl = No criteria identified curriculum: 8 h parent-training grp sessions All P’s completed post tx assessment after tx; waitlist grp then offered educational curriculum. O: Changes in Parent stress (via PSI) &amp; changes in behavior (via BAMBI &amp; FPI scores)</td>
<td>reported SS ↓ in PSI scores compared to waitlist grp No SS changes in feeding behaviors No SS changes in dietary variety</td>
<td>High attrition (Attrition N=11) Lacks follow-up</td>
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Abbreviations Key:

ABA = Applied Behavior Analysis  
Acc = acceptance  
ASD = Autism Spectrum Disorder  
Avg = average  
BAMBI = Brief Autism Mealtime Behavior Inventory  
BTS = Behavioral skills training  
Btwn = between  
CI = clinical interpretation  
Con = consumption  
Cont = continue  
Ctrl = control  
C/S = chewing & swallowing  
DD = Developmental delay  
Diff = Difference  
DNOS = Disorder Not Otherwise Specified  
DRA = Differential reinforcement  
DSM-IV-TR = Diagnostic & Statistical Manual of Mental Disorders, fourth edition, text revision  
EE = Escape Extinction  
F = female  
FPI = Food Preference Inventory  
FR = food refusal  
FS = Food selectivity  
GC = grams consumed  
Gnrl = Generalization  
Grp = Group  
h = hour  
HOH = hand over hand  
HPF = highly preferred foods  
HPS = high probability sequence  
Hx = history  
IMB = inappropriate mealtime behaviors  
Inc = increase  
Ind = independent  
Interx = Interaction  
IOA = interobserver agreement  
LPS = low probability sequence  
LT = long-term  
M = Male  
M = mean  
MB = Mealtime behaviors  
MBD= Mealtime behavior demand  
MDR = Modeling Differential Reinforcement  
MDRA = Modeling Differential Reinforcement of Alternative Behavior  
MEAL = Managing Eating Aversions and Limited variety Plan  
NRS = Non removal of spoon;  
NPF = non preferred foods  
Outpt= Out-patient;  
P = participant  
p = probability  
Pkg = Package  
PDD-NOS = Pervasive Developmental Difference Not Otherwise Specified  
PF = preferred food  
PG = Physical guidance  
Prf = performance  
PSI= Parent Stress Index-short form  
s = seconds  
SIT = sensory integration therapy  
SOS = Sequential Oral Sensory  
SS = statistically significant  
Tx= treatment  
Within = w/in  
Wk = week  
y = years old  
+ = positive  
# = number  
% = percentage  
& = and  
↑ = increase  
↓ = decrease
Summary of Key Findings

Summary of Experimental Studies (23)

Twenty-three experimental studies were found to fit within our search criteria. Of these, two participant-based video modeling studies resulted in increased food acceptance, with larger increases occurring when a reinforcement condition was added (Hillman et al., 2019; O’Connor et al., 2020). One study paired high probability instruction with low probability demand fading (without escape extinction) and utilized real-time modeling to successfully increase food acceptance (Penrod et al., 2012). Three caregiver/parent-training studies resulted in decreased inappropriate mealtime behavior (IMB) (Cosbey & Muldoon, 2018; Cosbey & Muldoon, 2017; Sharp et al., 2019), increased food acceptance (Sharp et al., 2019), or increased food variety (Cosbey & Muldoon, 2018). The fourth caregiver/parent training study resulted in increased food acceptance and did not address IMB (Clark et al., 2020). A structured caregiver/parent training program was found to be more effective at lowering IMB and increasing food acceptance than general caregiver/parent education (Sharp et al., 2019). Five studies were ABA-based and included positive reinforcement, all were effective in increasing food acceptance (Hodges et al., 2017; Koegel et al., 2012; Levin & Carr, 2001; Pizzo et al., 2009; Turner et al., 2020). For the purposes of this paper, ‘ABA-based’ includes research studies examining structured behavioral interventions which are designed to help clients reach a certain mastery criterion (i.e., a certain number of bites) through adherence to consistent treatment protocols (i.e., presenting the same number of bites/foods in the same manner each session). These interventions may follow a sequential treatment approach where if a bite alone is not accepted, subsequent sessions introduce positive reinforcement (i.e., a preferred food or toy) or escape extinction components (such as non-removal of the spoon).

Of the 23 experimental studies, 11 were ABA-based studies that involved a form of escape extinction during their interventions (Ahearn et al. 2002; Fernand et al., 2015; Flanagan et al., 2021; Fu et al, 2015; Gast et al., 2020; Penrod et al., 2010; Peterson et al., 2016; Peterson et al., 2019; Seiverling
et al., 2018; Silbaugh & Swinnea, 2018; Van Dalen et al., 2010). Of these studies, only one was found to not be effective at increasing food acceptance and variety (Silbaugh & Swinnea, 2018). The other 10 demonstrated increases in either food consumption or food variety and/or decreases in IMB. Three studies implemented a form of escape extinction for individual participants only if the initial treatment conditions were not effective (Fernand et al., 2015; Flanagan et al., 2021; Gast et al., 2020). Eight studies implemented a form of escape extinction as a part of the treatment or treatment sequence (Ahearn et al. 2002; Fu et al., 2015; Penrod et al, 2010; Peterson et al., 2016; Peterson et al., 2019; Silbaugh & Swinnea, 2018; Seiverling et al., 2018; Van Dalen et al., 2010).

None of the experimental studies had follow-up beyond six months post-intervention and only one had more than 20 participants (Sharp et al., 2019). Participants in all studies were either all male or majority male, other than Fernand et al. (2015) and Hodges et al. (2019), which had one male and one female participant. One study was AOTA level 1B RCT (Sharp et al., 2019), two were level 2B two group non-randomized studies (Ahearn et al., 2002; Peterson et al., 2019), and the remaining 20 were level 2 single-case experimental designs (SCED), indicating a moderate level of evidence strength for the experimental studies as a group.

**Summary of Outcome Studies (4)**

Three studies involved caregiver/parent training (Miyajima et al., 2017; Sharp et al., 2013; Seiverling et al., 2012) and one study used the SOS method (Galpin et al., 2018). Sharp et al. (2013) did not produce a statistically significant change in dietary variety or feeding behaviors; however, it did show a statistically significant decrease in caregiver/parent stress of the treatment group when compared to the waitlist. Miyajima et al. (2017) created a home-based caregiver/parent training and education program that increased food acceptance & variety while taking into consideration a variety of factors (oral, sensory, cognition, and environment). Seiverling et al. (2012) combined an escape extinction treatment package with caregiver/parent training, which resulted in decreased IMB and increases in bite
acceptance for all participants at a three month follow-up. All caregivers/parents rated the effectiveness of the package as ‘excellent.’ Galpin et al. (2018), conducted an SOS based tier two feeding intervention for a class of children with an ASD dx that resulted in decreased IMB and food selectivity.

None of these studies included any follow-up measures (except for Seiverling et al. 2012) and two had more than 20 participants (Miyajima et al., 2017 & Sharp et al., 2013). In all four studies, participants were majority male. All four studies were AOTA level 3B, indicating moderate strength of evidence for the outcomes studies as a whole.

**Implications for Practice**

**Implications for Consumers**

The client population we researched are children aged 3-12 years old with sensory-based feeding aversions and their caregivers/parents. Additional consumers may be children outside of this age range and have other feeding related concerns. For the researched population, the literature indicates that ABA-based interventions are the most studied and show effectiveness in increasing food variety, food acceptance, and decreasing inappropriate mealtime behavior. However, this research has not investigated long term effectiveness beyond six months post-intervention.

There is a lack of literature surrounding the SOS method, group therapy, interventions with majority female participants, and other sensory-based methods. A subset of studies indicate that caregiver/parent education programs have demonstrated effectiveness in decreasing IMB, increasing food variety, and increasing food acceptance. Therefore, caregivers/parents may choose to advocate for structured education or training to support the generalization of intervention results to the home setting. Caregivers/parents may choose to advocate for ABA-based feeding services with the knowledge that both positive reinforcement methods and escape extinction approaches can be effective. However, it is within a caregiver/parent’s right to decline escape extinction-based interventions on ethical grounds. To better prepare themselves and their children for therapy visits, it
is important that caregivers/parents understand the methods that are used in attempts to increase food acceptance and variety. Escape extinction has potential for use in cases of extreme malnutrition, but it may be difficult for caregivers/parents to manage (Flanagan et al., 2021) in their roles as observers of therapy and/or intervention implementers. Due to the nature of withholding preferred foods and requirement of compliance from the child, escape extinction has the potential to impact child-caregiver/parent interactions and therapeutic relationships. In many cases, research indicates that positive reinforcement methods such as praise or rewarding with a preferred food can be effective on their own or when paired with video modeling. Thus, caregivers/parents may advocate for interventions that focus on these more positive reinforcement based approaches. While there is minimal research on sensory-based methods, two studies in the literature resulted in decreased IMB and increased food acceptance and/or variety. These preliminary findings may support caregivers/parents as they advocate for continued research into minimally-studied intervention approaches (including group therapy and SOS).

**Implications for Practitioners**

Regarding the overall research question and potential program development, establishing a clinic-wide feeding therapy approach can take several forms. There are a variety of intervention approaches that appear to be effective in the short-term. Modeling interventions (video and in-person) particularly, resulted in increased food acceptance and variety, and were satisfying to caregivers/parents. For individual-based therapy, positive reinforcement strategies (including incorporating preferred food/toy rewards, choice components, and verbal praise) and caregiver/parent training also resulted in increased acceptance, food variety, and decreased IMB. Practitioners should not assume that sensory-based methods such as SOS, or group therapy interventions, are ineffective, but that there is simply a smaller volume of studies detailing the effectiveness of these approaches (one article in this review completed an unmodified group SOS
intervention). Practitioners should aim to establish an open dialogue with families, working to implement interventions that support healthy relationships with food and eating that can be sustained long-term.

While effectiveness was also demonstrated across studies encompassing escape extinction practitioners should be aware that this falls out of our scope of occupational therapy practice and should not be implemented without proper training. Further, the secondary effects on caregiver-child relationships, caregiver/parent burden, and therapeutic relationships when considering which interventions to implement should be considered. Finally, while many components of ABA-based interventions fall within the OT scope of practice, escape extinction involves ignoring a child’s behavior (pushing spoon away, turning head away, hitting, yelling, etc.) until the child consumes the food. OT is a holistic practice and these methods may not be seen as grounded in the client-centered principle of treating all behavior as communication. These methods are typically used with autistic individuals and more research should be done to gain that population’s perspective and experience with escape extinction. It is important to note that if any feeding intervention method does not align with the code of ethics outlined by AOTA, or the philosophical values of the practitioner’s setting, they are not obligated to implement them.

**Implications for Researchers**

There are several gaps in the current body of feeding therapy evidence. These include: 1) a lack of long-term follow-up for interventions; 2) minimal studies evaluating the effectiveness of group therapy and sensory-based methods; 3) little qualitative research surrounding the experiences of clients and caregivers/parents with different feeding therapy methods; 4) few higher level evidence studies; and 5) lack of research conducted with female participants. Practitioners need researchers to investigate each of these gaps in order to be confident in the sustained effectiveness of approaches that they are using in practice and/or in the implementation of new intervention methods. Specific
questions for researchers include: What are the long-term outcomes of ABA and sensory-based interventions (exceeding 6 months)? Can group therapy be effective at increasing food consumption/variety and decreasing IMB? What are caregivers/parents’ and/or participants' experiences with ABA-based approaches utilizing escape extinction? What treatment packages are effective for a large participant sample size (without requiring extensive modification)? What interventions can be combined to avoid using escape extinction? Can tier 2 interventions decrease occurrences of pediatric feeding challenges? Are interventions shown to be effective for male clients as effective for female clients?

**Recommendations for Best Practice**

To best support populations with feeding difficulties, more research needs to be conducted examining the efficacy of group and sensory-based approaches to feeding therapy as well as the long term effects of existing interventions. The SOS method is widely used in practice, particularly for group therapy; therefore, it is paramount that research regarding its effectiveness be conducted to support evidence-based practice. Other research avenues include qualitative studies regarding participant experience with feeding intervention methods, and the recruitment of more diverse participants for studies addressing sensory-based feeding aversions.

In terms of implementation, structured ABA-based behavioral interventions have a strong efficacy in addressing sensory-based feeding outcomes among a small number of participants, which suggests that it may be beneficial to utilize these interventions in practice. Furthermore, structured caregiver/parent education programs, classroom wide interventions, and video modeling, show efficacy in increasing food acceptance and food variety which may potentially supplement other intervention methods. Due to the limited literature on group feeding therapy, the original research question comparing its effectiveness to individual therapy remains unanswered. To address this lack of sufficient evidence, we recommend research on existing feeding groups be implemented and that
progress be tracked over time, with particular attention to food consumption and variety. This focused approach would allow for more significant comparisons between individual and group therapy methods to better inform practitioners and consumers of their comparative effects.

Involvement Plan

Introduction

We shared the culmination of our literature review of the available feeding therapy research with our collaborator, Hannah. During the meeting, we highlighted the available research on sensory based individualized behavioral interventions, escape extinction, caregiver/parent training, and video modeling - all of which showed effectiveness in increasing food consumption, variety, and/or decreasing inappropriate mealtime behavior. However, our collaborator decided against implementing applied behavioral analysis (ABA) based interventions (interventions utilizing tangible reinforcements in the form of preferred food or toys, use non-removal of the spoon (NRS), and/or use escape extinction) into her practice as these methods do not align with her values due to ABA’s focus on extrinsic motivation rather than intrinsic motivation. We further discussed the lack of available research on group feeding therapy and the SOS approach. Due to the insufficient amount of literature available to justify implementing group feeding therapy into her clinic, both the collaborator and our team decided it was best to not proceed with group feeding therapy as a knowledge translation activity.

Conversations regarding potential knowledge translation activities included supporting video modeling interventions within the collaborator’s clinic and potentially creating videos for her to utilize during sessions. However, due to the individualized nature of feeding therapy using the SOS approach, it was determined that videos may not best support her current practice. Utilizing the specific caregiver/parent education programs available within the research was also considered, but ultimately rejected as many of these interventions involved extrinsic motivation. Our collaborator did, however, express interest in learning more about the methodology used in the successful caregiver/parent training
programs found in the literature and for our final knowledge translation project to be geared towards caregivers/parents. The meeting concluded with a final discussion about modifying her current caregiver/parent education materials and creating an in-home documentation log for tracking progress with feeding therapy for caregivers/parents to complete during in-home meal times.

**Needs Assessment**

The collaborator’s caregiver/parent education materials were a mix of materials she created herself, materials received from her SOS Approach to Feeding training, and other materials she gathered over the years from various sources, including the Ellyn Satter Institute. She expressed a desire for her current caregiver/parent education materials to be reviewed and modified to be more concise and easy to digest. She was also receptive to incorporating a home documentation log into these materials to support progress monitoring at home. Therefore, in an effort to address the collaborator’s need for improving communication between herself and caregivers/parents, it was determined that the research team would modify her current caregiver/parent education materials and develop a strategy for caregiver/parents to document their child’s progress at home. Caregiver/parent education materials that are concise, clear, and informative were desired project outcomes, as well as an in-home documentation log supporting quantifiable progress tracking over time. This log will serve as a beneficial support for our collaborator to understand how in-clinic education and training procedures are being translated at home with families and will facilitate a quantitative record of progress made using the SOS method. Tracking therapy progress will help the collaborator understand which aspects of treatment sessions are useful and what could be improved to best fit the needs of the child and their families. Further, a documentation tool can help the collaborator identify areas of improvement that need to be addressed in clinic sessions and highlight where further research and education is needed to support evidence-based practice. Ultimately, the knowledge translation activity will produce more accessible
caregiver education materials while also serving as an internal research opportunity for the collaborator to better track client progress at home using the SOS method.

**Knowledge Translation Activities**

Based on the results of the needs assessment, the primary type of knowledge translation activities conducted included a combination of client/caregiver information products and outcome monitoring strategies. To accomplish these knowledge translation goals, we first modified current caregiver/parent education materials to better fit the needs of our collaborator and her clients’ families. Secondly, we created a documentation form for caregivers/parents to track progress at home. Creating educational materials that guide caregivers/parents in implementing common practice procedures done by the SOS approach and Ellyn Satter’s Division of Responsibility in Feeding supports caregiver/parent education practices. With more effective educational materials, caregivers/parents will be better equipped to 1) generalize in-clinic interventions to in-home and within the community; 2) document progress correctly and effectively; and 3) ask more informed questions to support the therapy process. Embedded documentation will improve the collaborator’s ability to track progress across multiple settings (at home and in-clinic), providing useful feedback regarding intervention effectiveness and generalization.

**Context**

Facilitators to the knowledge translation process included the collaborator’s excitement and motivation to improve caregiver/parent education and to better understand what happens during in-home meal times for each client. Further, educational handouts were already being given to caregivers/parents, so providing alternative and/or additional educational handouts was reasonable to accomplish given the collaborator’s resources and commitment to caregiver/parent involvement during the therapy process. Lastly, the structure of her current caregiver/parent education practice was
amenable to change and supported the inclusion of a documentation addendum to support effective progress tracking at home.

One identified barrier to the knowledge translation process was its reliance on caregiver/parent accountability to thoroughly read, understand, complete, and keep track of the educational and progress-tracking documents. Due to the science-based nature of the field, reading materials written with medical-based terminology may not be reader-friendly, making the information difficult to absorb for many families. As the knowledge translation process continued forward, it was necessary to consider the intended audience during the development of new caregiver/parent education materials & documentation forms. Another barrier included an increased time demand placed on the collaborator to provide caregiver/parent training for correct documentation and to answer questions regarding the form and/or process. After deliberation, we created a written weekly tracking log, modified caregiver/parent education materials, and designed a post-survey for caregivers/parents to assess the tracking log’s understandability and ease of use.

**Knowledge Translation Effort**

Ultimately, our goal was to 1) modify current caregiver/parent education materials to be more concise and readable and 2) create a documentation form for caregivers/parents to monitor at home progress of feeding therapy that:

a) Supports the collaborator in understanding what is happening during in-home mealtimes for clients

b) Improves quantifiable progress tracking across settings

c) Encourages caregivers/parents to engage more with their child’s therapy

d) Educates and trains caregivers/parents on the generalization of therapeutic procedures at home

e) Educates and trains caregivers/parents on mealtime behaviors they should be observing and what to do at home
f) Better informs the collaborator on what will be most effective to do in the clinic during sessions for each client

Required tasks that were accomplished in order to carry out the knowledge translation effort include the following:

a) Met with our collaborator to discuss knowledge translation activities. Completed 11/22/22

b) First draft of involvement plan submitted to project chair. Completed 12/13/22.

c) Met with the project chair to develop a plan for knowledge translation materials. Completed 1/19/23.

d) Developed first draft of KT materials. Completed 1/20/23.


f) Sent our first draft of the materials to our collaborator and received feedback via email. Completed 12/25/22.

g) Zoom meeting with our collaborator to present our second draft of KT materials. Completed 2/10/23.

h) Sent a third draft to our collaborator with a plan to release it to caregivers/parents. Completed 2/15/23.

i) Received Home Feeding Log and Feedback survey results for data collection. Completed 2/23/23.

j) Met with our project chair to receive feedback on project progress. Completed 3/8/23.

k) Data collection completed on 3/22/23.

l) Fourth and final draft of Home Feeding Log sent to the collaborator for personal use on 3/28/23.
Knowledge Translation

Home Feeding Log

To create the Home Feeding Log (see Appendix F), we examined current documentation materials the collaborator uses to track intervention progress. The documentation system she uses is specific to her pediatric clinic (unstandardized) and for her use only. We took these materials and strategized ways to adapt the in-clinic progress measures to a form geared towards caregivers/parents and the home setting. We assessed the language used in the original documentation form and modified it to increase the understandability for individuals without a medical or feeding therapy background. We also added an example food (i.e. chicken) to increase understanding of how to complete the form and to be clear about what information is desired by the collaborator. Our version of the home feeding log went through a total of three revisions to ensure quality. After the first draft was created, we used email correspondence to receive initial feedback from our collaborator regarding the form and then made the suggested adjustments. A virtual meeting with the collaborator was held to review the second draft in greater depth. We added additional modifications after receiving this feedback to create our third draft of the Home Feeding Log. We sent out our third draft and caregiver/parent survey to the collaborator to receive feedback from the client’s caregivers/parents. We received one survey back, providing input on further supportive modifications to increase ease of use. Our third draft was also reviewed by our project chair, who provided additional suggestions for revision. After receiving feedback from caregivers/parents and our chair, we created the fourth and final draft of the Home Feeding Log.

A technical problem that consistently arose during development of the Home Feeding Log included fitting the desired information into a one-page, reasonable, and succinct table. The process required continual modifications, simplifications, and decisions regarding the most pertinent information the collaborator wanted to know. Initially, the collaborator suggested that documentation of 3-4 foods was a reasonable number, but upon further consideration it was decided that documentation of 1-2
foods was more realistic for caregivers/parents. In an effort to implement feedback from both parties (collaborator and caregiver/parent survey), we created the Home Feeding log to fit one food item per page (rather than several per page) and shifted the presentation style from a landscape to a vertical view to increase writing space.

**Caregiver/parent education materials**

To create the caregiver/parent education materials, we first met with the collaborator to discuss her current materials and determined areas she believed needed either modification, clarification or simplification. She stated that she wanted the materials to be more digestible and condensed. While going over her materials, which originated primarily from an SOS Approach to Feeding certification course, we discovered some of the documents were copyrighted, prohibiting us from legally modifying them. Our solution was to create supplemental documents to clarify key terms (e.g., adding a synonym for “bolus”) and present examples of the SOS Approach in real-life. These additions are designed to facilitate improved understanding of the copyrighted SOS Approach To Feeding materials [see Appendix B]. We took the materials that the collaborator had personally created, including “Oral Motor Play Ideas” (see Appendix C) and “Family Meals” (see Appendix D) and modified them by providing visual examples and expanding on current examples to clarify instructions. After creating our first draft of the documents, we met virtually with the collaborator to review each section in detail. We took the feedback we received and modified the materials accordingly. The second draft of these documents were then sent in their final form to the collaborator for use as desired within her clinic setting.

**Survey**

The purpose of the survey (see Appendix E) was to understand caregivers/parents’ perception of the ease of use and understandability of the Home Feeding Log. The survey consisted of four questions, three of which used a Likert scale of 1-5 (strongly disagree to strongly agree), and one question reserved for open comments. However, after receiving feedback from our project mentor, we reduced the scale to
1-4 in an effort to reduce the amount of neutral feedback received. We considered adding more questions, but were cognizant of potential negative effects, including lower completion rate due to increased caregiver/parental effort. Therefore, the original amount of questions asked was retained.
## Workflow

<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/22/22</td>
<td>Meeting with collaborator to discuss results of literature review and brainstorm relevant knowledge translation (KT) activities</td>
</tr>
<tr>
<td></td>
<td>• Home documentation log and modification of caregiver education materials agreed upon by research team and collaborator as potential KT options</td>
</tr>
<tr>
<td>12/13/22</td>
<td>First draft of involvement plan submitted to project chair</td>
</tr>
<tr>
<td></td>
<td>• Chair approved</td>
</tr>
<tr>
<td></td>
<td>• KT project ideas and requested meeting to develop them in more detail to ensure sufficient depth of materials</td>
</tr>
<tr>
<td>1/19/23</td>
<td>Meeting with project chair to develop comprehensive plan for KT material development and dissemination</td>
</tr>
<tr>
<td></td>
<td>• Main discussion points</td>
</tr>
<tr>
<td></td>
<td>○ Importance of respecting copyright law during modification of SOS materials</td>
</tr>
<tr>
<td></td>
<td>○ Plan to take KT materials through several iterations of feedback (including collaborator, caregivers, and chair)</td>
</tr>
<tr>
<td>1/20/23</td>
<td>Project work day: 1st draft of materials completed (Home documentation log, caregiver education material modifications, post-survey)</td>
</tr>
<tr>
<td>2/10/23</td>
<td>Meeting with collaborator to present 2nd draft of materials</td>
</tr>
<tr>
<td>2/15/23</td>
<td>3rd draft of Home Feeding Log sent to collaborator</td>
</tr>
<tr>
<td></td>
<td>• Dissemination plan: collaborator to send out home documentation log/survey to families attending her clinic within the next two weeks</td>
</tr>
<tr>
<td>2/23/23</td>
<td>Received completed Home Feeding Log and post-survey from one family</td>
</tr>
<tr>
<td></td>
<td>• Caregiver feedback received, corresponding edits made to 3rd draft of Home Feeding Log</td>
</tr>
<tr>
<td>3/8/23</td>
<td>Meeting with project chair to update her data collection efforts and to receive one more iteration of feedback on overall project materials</td>
</tr>
<tr>
<td></td>
<td>• Chair feedback received, corresponding edits made to 4th draft of Home Feeding Log</td>
</tr>
</tbody>
</table>
Outcomes Monitoring

To ensure our documentation system was effective and satisfactory for both our collaborator and her clients, we administered a post-survey for caregivers/parents regarding their documentation experiences that rated the understandability and ease of use of the Home Feeding Log (i.e. “This form was easy to use”, “I could understand the form’s instructions”, “It took me ___ minutes to log a food.”). We originally intended to administer a pre and post survey, however due to time constraints and frequency of feeding services offered by our collaborator it was more feasible to send out a post survey of the Home Feeding Log. We consulted with our collaborator about her experience with the final draft of the Home Feeding Log and she expressed high satisfaction in the understandability and ease of use for herself as a practitioner. We then shared the Home Feeding Log with our project chair to assess its quality and received feedback on potential changes to implement, which included the organization and content of the document. To gain empirical data on our documentation system with caregivers/parents, the collaborator shared the Home Feeding Log and survey with two clients but only received one survey back due to appointment cancellations. The survey was received (via email), presenting client family feedback on the understandability and ease of use of home documentation log. Although the Home Feeding Log and post survey were not shared with multiple families as hoped, the collaborator was able to share her positive feedback on the readability and ease of use of modified caregiver/parent education materials from a practitioner perspective, to be utilized for future client families.
Evaluation of Outcomes

The Home Feeding Log was evaluated for effectiveness by three different stakeholders: the project collaborator (twice), the project chair (once), and the caregiver/parent of a child receiving services at the collaborator’s clinic (once). Areas of change to the Home feeding log provided by the collaborator included increasing its specificity and adding an additional section documenting actions that helped to increase child food interaction. She indicated that the example section of the documentation log created by the feeding research team would be a helpful way to assist caregivers/parents in completing the form. Overall, the collaborator deemed the log to be effective and planned to implement it in her practice after the requested changes were made. Following these edits, the Home Feeding Log was sent out and returned by one client family who completed it over a two-day period, as well as the post-survey evaluating its understandability and ease of use. Survey results are presented below.

<table>
<thead>
<tr>
<th>This form was easy to use. Circle one</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Strongly Disagree</td>
</tr>
</tbody>
</table>

I could understand the form instructions. Circle one

| 1 Strongly Disagree | 2 Disagree | 3 Neutral | 4 Agree | 5 Strongly Agree |

It took me ____ minutes to log a food. Circle one

| Less than 5 | 5-10 | 10-15 | More than 15 |

Comments regarding any previous answers:

Could use more space to write

Based on the results of the survey, the documentation log was deemed understandable and easy to use by the caregiver/parent. However, written feedback indicated that more writing space would have been helpful to aid in completion. Therefore, in the final iteration of the log, the orientation of columns was flipped and the number of foods reduced to one per page to increase the amount of space provided.
While efficacy of the Home Feeding log was reported by both our collaborator and a caregiver/parent, it is important to note that they represent a small sample size, and as such, no conclusions can be drawn regarding the generalizability of the tool and whether or not it would be effective or usable for all practitioners and caregivers/parents using the SOS feeding therapy approach. For example, in her iteration of feedback, the project chair identified other areas of the log where verbiage could be reduced (i.e., eliminating some of the example sections). The research team decided not to incorporate this feedback into the final version of the log sent to the collaborator based on collaborator satisfaction with the current form. The log, however, was sent as a Word document to the collaborator so that changes can be easily added over time based on the collaborator’s discretion.

The caregiver/parent education materials were evaluated for effectiveness by the project chair (once) and the collaborator (once). Initial feedback provided by the chair guided the modification of materials to prevent infringement of copyright on resources developed by the creators of the SOS approach. After presenting the project collaborator with a first draft, modifications discussed in the knowledge translation section of this report were made to the complete set of caregiver/parent education materials. The collaborator reported satisfaction with these changes and indicated that modifications would increase the accessibility of materials to caregivers/parents in her clinic. Unfortunately, we were unable to give the updated materials to a new client, and as such, no conclusion can be drawn about their accessibility from the consumer perspective.

Having completed the outcomes monitoring process, the research team learned about several key aspects of the research process as well as the degree to which knowledge translation materials could be implemented into practice. The importance of several iterations of feedback from multiple parties is indicated in the changes made both to the home documentation log and the caregiver/parents education materials. In creating space for caregivers/parents to fill out the home log, the team initially failed to consider the difference in space requirements needed for typing and writing. Encapsulating the
caregiver/parent perspective in subsequent edits to the log was vital to creating a document usable by both collaborator and client. Limitations of the outcomes process included receiving only one home documentation log and completed caregiver/parent survey as well as not being able to assess the accessibility of education materials from a caregiver/parent perspective. Future projects requiring feedback from both collaborators and clients should include multiple pre and post-surveys for each party and span over time to garner a more nuanced and comprehensive perspective of the effectiveness of home progress tracking. This approach would have increased the validity of outcome results and allowed for more generalizable conclusions regarding the effectiveness of both the home documentation log and caregiver/parent education materials.

**Recommendations**

Based on the results of the research process, there is a clear need to conduct more research on feeding groups utilizing the SOS approach and/or other sensory-based approaches. There is also a need for studies examining the long term effectiveness of these approaches (as well as other more studied approaches) on improving dietary consumption and/or food variety for clients. Without the knowledge of long term effectiveness of these approaches it is unclear the extent to which treatment methods provide beneficial long term effects for clients in meeting desired feeding outcomes. We also recommend an expanded search of the literature to include younger demographics (younger than 3 years) in order to broaden the amount of available literature, which may include feeding groups utilizing SOS and/or other sensory-based approaches. Due to the nature of the collaborator’s setting we excluded this age demographic, however it would still be beneficial to evaluate the effectiveness of any sensory-based approaches within this age demographic to expand our understanding of the current methods being utilized in practice. Another consideration is to conduct research within the community to evaluate current group feeding therapy in various outpatient settings in order to make comparisons about therapeutic approaches utilized by practitioners. Additionally, we recommend further qualitative
research on client and caregiver/parent experiences engaging with the SOS approach as well as other sensory based approaches utilized in practice. Finally, in an effort to highlight more evidence-based research, it will be important to promote higher level study designs to increase measures of efficacy of the SOS Approach and other sensory based methods for individual and group settings. Higher level evidence studies across approaches will better inform practitioners about the effectiveness of current intervention methods and provide valuable information during deliberations for implementing new approaches in practice.
References

https://doi.org/10.1002/bin.112

https://doi.org/10.1007/s40617-020-00419-w


https://doi.org/10.3389/feduc.2018.00077
EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN


https://doi-org.ezproxy.ups.edu:2443/10.1002/bin.1693


https://doi-org.ezproxy.ups.edu:2443/10.1002/jaba.650


[Photograph of child biting an apple]. (n.d).

EFFECTIVENESS OF FEEDING THERAPY APPROACHES ON CONSUMPTION IN CHILDREN


[Photograph of child puts on lipstick]. (n.d).
https://www.shutterstock.com/search/little-girl-putting-on-lipstick

[Photograph of drinking with a straw]. (n.d).

[Photograph of eating Ice Cream]. (n.d).
https://pixabay.com/photos/ice-cream-dessert-sweet-food-2588541/

[Photograph of open mouth]. (n.d).
https://stock.adobe.com/search?k=widening+mouth&search_type=recentsearch&asset_id=251


https://doi.org/10.1007/s10803-018-3604-z


https://doi.org/10.1016/j.jpeds.2019.03.046


*Articles used in literature review.
Appendix A

Key Terms

In the “Taste” step:
- **Bolus**: a small ball of chewed food that will be swallowed; “bite size”
- ‘X’ times: number of times the child chews an amount of food

In the “Odor” step:
- **Forward space**: directly in front of the child; for example, on their own plate
- **Odor in/at**: Meaning that the child is willing to smell the food from a given distance; for example, at the far end of the table from them
Appendix B

What could the Steps to Eating look like in real life?

Example food: Chicken

1. **Tolerates:** Is okay with chicken being in the middle of the table in a communal dish but not on their plate.

2. **Interacts with:** Helps serve chicken to others, but does not have it on their plate. This can also be an interaction with the use of a tool, like a spoon, fork, or toothpick.

3. **Smells:** Is okay with the smell of chicken when placed on the table in front of them.

4. **Touches:** Picks up a piece of chicken in their hand and puts it back down on a plate other than their own.

5. **Tastes:** Chews a piece of chicken two times before spitting it out.

6. **Eats:** Eats the serving of chicken on their plate.
Appendix C

ORAL MOTOR PLAY IDEAS:

1. **Blowing**

   Blow bubbles

   (child blowing bubbles, n.d.)

2. **Chewing/Jaw Strength**

   Make teeth marks on food

   (Child biting apple, n.d.)

3. **Tongue Movement**

   Move tongue to touch corners of mouth while making silly faces

   (Woman making goofy face, n.d.)

   Licking popsicles/ice cream cones

   (Eating ice cream, n.d.)

Adapted materials by Hannah Michlmayer, OTR/L, created by Kayla Estes, Josie Ash, Rachel McElroy, Cecilia Morales
4. Lips (in front of mirror)

Pucker lips like when putting on chapstick

(Child puts on makeup, n.d.)

5. Sucking

Straws with thick milkshake to strengthen suck

(Drinking with a straw, n.d.)
Appendix D

Family Meals

Purpose: To increase the VOLUME of your child’s preferred foods and to increase their EXPOSURE to a variety of other foods.

Guidelines:

- Create a meal-time routine including:
  - Verbal warning of meal time to come
  - Sensory preparation, if required
  - Washing hands
  - “Clean up” after meal time is done - have your kiddo blow or throw 1 piece of each food into a scraps bowl.

- At the table:
  - Use one placemat for each person to signify mealtime.
  - Include the following components as part of each meal:
    - Protein (i.e. meat, beans, tofu, cheese, peanut butter, etc.)
    - Starch (i.e. rice, quinoa, potatoes, pasta, bread, etc.)
    - Fruit/veggie
    - 1-2 preferred foods (foods that they know and like - they can be from any category above)
    - **For any new food, make sure the serving size is small. This could look like a single floret of broccoli or two pieces of a new pasta noodle.
  - Serve meals “community style” (i.e. pasta in one larger dish, chicken in another and everyone self-serves).
    - This provides more chances for positive interactions with new foods. The child can serve their own portion (or someone else’s) or simply be near/smelling the food for the duration of the meal.

- If you can’t eat this way or serve each component at each meal, do not stress! Do what works best for you and your loved ones.
Appendix E

Home Feeding Log Feedback Survey

1. This form was easy to use. Circle one.

1 2 3 4
Strongly Disagree Agree Strongly Disagree
Disagree Agree

2. I could understand the form instructions. Circle one.

1 2 3 4
Strongly Disagree Agree Strongly Disagree
Disagree Agree

3. It took me ____ minutes to log a food. Circle one.

Less than 5 min 5-10 min 10-15 min More than 15 min

Comments regarding any previous answers:
## Home Feeding Log:

**Instructions:** Use this form to document your child’s interactions with foods at home or away from the clinic. Try to document 1-2 food interactions between sessions (1 per page). Please bring this form back to the clinic on your next visit.

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Example: 1/20; 5pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>What food is the child interacting with?</td>
<td>Steamed broccoli</td>
</tr>
<tr>
<td>Is this a new food or a food they don't like?</td>
<td>Don't like</td>
</tr>
<tr>
<td>How have they interacted with this food before?</td>
<td>Yes, touched it to move off of their plate</td>
</tr>
<tr>
<td><strong>What was the context in which they child interacted with this food today?</strong></td>
<td>Dinner time with family at home</td>
</tr>
<tr>
<td>I.e. snack after play time; dinner time with family; before school</td>
<td></td>
</tr>
<tr>
<td><strong>How did the child interact with this food by the end of the meal today?</strong></td>
<td>Touched it on their plate and tolerated it staying on their plate for the meal</td>
</tr>
<tr>
<td>I.e. tolerated the food on plate; took two bites before spitting it out</td>
<td></td>
</tr>
<tr>
<td><strong>What was the child’s behavior like while interacting with this food?</strong></td>
<td>Giggly, laughing and making jokes with family. Lots of energy.</td>
</tr>
<tr>
<td>I.e. cooperative, good mood (laughing, playful), refused to eat, upset (crying, yelling, tired), hesitant, etc.</td>
<td></td>
</tr>
<tr>
<td><strong>What helped the child move up the steps to eating (if applicable)?</strong></td>
<td>Pretending the broccoli was a tree and dipping it in ranch</td>
</tr>
<tr>
<td>Date/Time</td>
<td>Example: 1/20; 5pm</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------</td>
</tr>
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</tr>
<tr>
<td>How have they interacted with this food before?</td>
<td>Yes, touched it to move off of their plate</td>
</tr>
<tr>
<td>I.e. tolerated food in the room; touched the food with finger; took one bite and spit it out</td>
<td></td>
</tr>
<tr>
<td>What was the context in which the child interacted with this food today?</td>
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Acknowledgements

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