Social validity of pediatric feeding treatment components across time

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Social validity of pediatric feeding treatment components across time

Tessa Taylor[1,2] | Sarah Ann Taylor[3]

[1]University of Canterbury/Te Whare Wānanga o Waitaha, Christchurch, New Zealand

[2]Paediatric Feeding International, Sydney, New South Wales, Australia

[3]School of Psychology, University of Auckland/Waipapa Taumata Rau, Auckland, New Zealand

Correspondence
Tessa Taylor, University of Canterbury/Te Whare Wānanga o Waitaha, Private Bag 4800, Christchurch 8140, New Zealand.
Email: DrTaylor@PaediatricFeedingIntl.com

Abstract

There is limited research on the social validity of treatment for pediatric feeding disorders. When it is assessed, the evaluation of treatment acceptability may focus on a few specific procedures or the entire program post-treatment. This report took place within a home-based behavior-analytic treatment model in Australia. Caregivers of eight children (aged 3–11) with pediatric feeding disorders provided treatment acceptability ratings for the full range of treatment procedures, at pre- and post-treatment. Caregivers were also provided the opportunity to provide open-ended responses. Results showed that caregivers unanimously gave strong ratings of the importance of goals, and preferred that treatment be effective and quick, over minimizing side effects. Procedures experienced by all caregivers (differential attention, tangible reinforcement, nonremoval of the spoon, and re-presentation) were rated highly at admission and increased at discharge, with the exception of tangible electronics. Caregivers of children receiving additional procedures for acceptance or clean mouth also provided high acceptability ratings for these at both timepoints. This report is the first to examine pre- and post-acceptability measures on the full range of treatment procedures with caregivers experiencing treatment. Results inform future research and will serve to improve efforts to disseminate

behavior analysis as an acceptable and effective treatment for pediatric feeding disorders.

1 | SOCIAL VALIDITY OF PEDIATRIC FEEDING TREATMENT COMPONENTS ACROSS TIME

Behavior-analytic treatments are the only empirically-supported intervention for varied pediatric feeding disorders (Kerwin, 1999; Sharp, Volkert, et al., 2017; Taylor & Taylor, 2021a; Volkert & Piazza, 2012). In addition to the body of research focused on highly controlled settings, recent research highlights that these treatments can also be effective in homes (Najdowski et al., 2010; Seiverling et al., 2012; Taylor, 2020c; Taylor et al., 2019, 2020). In terms of social validity, the literature generally asserts that pediatric feeding interventions produce behavior change of social importance that maintains in the individual's day-to-day life (Baer et al., 1968; Kazdin, 1977; Wolf, 1978).

However, social validity reporting is often low and inconsistent in the pediatric feeding literature, represented in approximately 30% of studies published between 2009 and 2020 (Taylor & Taylor, 2022). Most commonly, social validity has been measured by Likert-type questionnaires, either standardized (e.g., Intervention-Rating-Profile-15 (IRP-15); Martens et al., 1985; Taylor et al., 2020; Woods & Borrero, 2019) or those developed ad hoc for the study (e.g., Hoch et al., 1994; Rubio, Volkert, et al., 2020; Sharp, Stubbs, et al., 2017; Taylor et al., 2017). Recent novel approaches include qualitative and quantitative analyses of caregiver interviews to inform the design of questionnaires that prioritize the unique perspectives of caregivers seeking treatment (Anderson et al., 2021).

The results of social validity measures generally highlight that pediatric feeding treatment procedures are acceptable, and that outcomes of treatment are meaningful to caregivers. However, scores are often averaged across items or participants, thus it is difficult to ascertain specific variables that may be relevant to individual children, caregivers, or the specific procedures implemented (Park & Blair, 2019; Snodgrass et al., 2018).

Caregiver treatment acceptability may indicate the likelihood to continue using the procedure, to recommend it to others, or whether the benefits justify any potential side effects (Kazdin, 2014). However, acceptability of procedures has rarely been examined in depth. In many cases, acceptability is collapsed and averaged in the general measures of social validity, is measured for the multicomponent treatment package, or only for certain procedures (e.g., physical guidance; Ahearn et al., 2001; Borrero et al., 2013). Beyond questionnaires, some studies have attempted other methods to address acceptability, such as providing caregivers with a choice of intervention procedures or targets (e.g., Ahearn et al., 2001; Borrero et al., 2013; Kozlowski et al., 2016; Piazza, Patel, et al., 2003).

Evaluating treatment acceptability for pediatric feeding disorders is important given the increased focus on the acceptability of behavior-analytic interventions overall (Leaf et al., 2021), and the recurring concerns specific to certain feeding procedures. Concerns often relate to escape extinction variations, with anecdotal reports of caregiver discomfort, but there is a lack of sufficient data supporting these concerns (Rubio, McMahon, et al., 2020). In contrast, the currently available data suggests high caregiver social validity for children receiving escape extinction treatments (Allison et al., 2012; Hoch et al., 1994, 2001; Laud et al., 2009; Najdowski et al., 2010; Rubio Volkert, et al., 2020; Sharp, Stubbs, et al., 2017; Taylor et al., 2020; Woods & Borrero, 2019), even when caregivers are the main implementer of the procedure (Bui et al., 2013; Najdowski et al., 2010). Social validity may also be impacted by the difficulty of implementing specific procedures. For example, parents may perceive extinction procedures difficult initially before training (e.g., compared with praise; Ulloa et al., 2019) or prefer procedures requiring less equipment (e.g., manual vs. brush side deposit; Taylor, 2020c). Further, a recent retrospective analysis ($N = 32$) also showed that

acceptability was high, and did not significantly differ across caregivers experiencing procedures of varying difficulty, or between extinction versus non-extinction procedures (Taylor & Taylor, in press).

Overall, the current lack of specific data may cloud how caregivers perceive the wide range of procedures, including those that may generally be perceived as "least intrusive." Current reports highlight caregivers that have shown preference for treatments which may be considered of higher intrusiveness (Ahearn et al., 2001; Piazza, Patel, et al., 2003; Rubio, McMahon, et al., 2020), potentially due to quick effectiveness or fewer corollary behaviors (Ahearn et al., 1996). Caregivers in Borrero et al. (2013) preferred a finger prompt over a jaw prompt as they felt the finger prompt would allow easier bite placement. In Piazza, Fisher, et al. (2003) some caregivers preferred escape extinction *without* differential reinforcement.

In the treatment of childhood disruptive behavior, caregivers commonly rate positive reinforcement procedures highest (Eid et al., 2019; Jones et al., 1998). However, caregivers have also been shown to rank a perceived intrusive treatment (response cost) more highly than one considered less intrusive (differential attention; Jones et al., 1998). Research also shows that preference for punishment interventions may be more likely as behavior severity increases (Wei et al., 2021). Culture is rarely discussed in behavior-analytic research, but also exerts a strong influence on treatment acceptability. For example, parents of cultures with an authoritarian parenting style may be more likely to accept punishment-based interventions (Mah & Johnston, 2012). With respect to pediatric feeding, culture further shapes food choices, feeding methods, and mealtime routines (May & Dietz, 2010).

Of further concern is that measures of acceptability are typically obtained post-treatment. Thus, acceptability ratings may be influenced by the order of treatment procedures (e.g., the procedure most recently experienced; Ahearn et al., 2001), or as a function of intervention outcome, as opposed to a true perspective of the procedures alone. Post-treatment, a caregiver may perceive that the benefits outweighed any initial discomfort with the procedures. For escape-maintained behaviors, caregivers were shown to prefer escape extinction because it was most effective in reducing problem behavior and increasing compliance (Owen et al., 2021). This may be especially true if those procedures are rarely used post-treatment (e.g., where the child no longer contacts extinction).

To explore acceptability further, it is important that procedures are evaluated at pre- and post-treatment. Doing so for specific procedures could identify if acceptability ratings shift over time, for instance, if an intrusive procedure may increase in acceptability after prior putative least intrusive alternatives were ineffective (Rubio, Volkert, et al., 2020). Or, if caregiver acceptability changes once the caregiver is required to actually implement the procedures (Owen et al., 2021). Measuring acceptability pre-treatment may also indicate certain procedures that require careful consideration with individual families and cultures, ultimately adding to the social validity and cultural fit of the overall treatment process (Jones et al., 1998).

There is an essential need to examine treatment acceptability further, given the gaps in the literature and the need to disseminate accurate information about behavior-analytic procedures. The current report aims to address these gaps by examining acceptability ratings pre- and post-treatment from caregivers of eight children receiving home-based behavior-analytic treatments for pediatric feeding disorders. Acceptability was measured across the full range of potential procedures separately. Surveys evaluated acceptability with respect to the goals of treatment, the culture of the family, and the balance between time to effect against minimizing side effects. This report is the first to examine pre- and post-acceptability measures on the full range of specific treatment procedures with caregivers experiencing intensive pediatric feeding treatment.

2 | METHOD

2.1 | Participants and setting

This report involved a retrospective analysis of clinical social validity data for seven males with autism spectrum and severe pediatric feeding disorders (avoidant restrictive food intake disorder [ARFID]) and developmental disabilities,

and one female sibling with typical development admitted for a home-based, behavior-analytic treatment program (as described in Taylor et al., 2020). Inclusion criteria were all full admissions from December 2020 to 2021, and the survey response rate was 100%. Average age was 5.1 years (range, 3–11). Prior to treatment, each child's physician approved their participation and provided medical information (e.g., prior testing, growth and medical history, food allergies, review of systems). We conducted a comprehensive intake including record review (including child's existing providers/other disciplines), comprehensive caregiver forms and interview, diet record, meal pictures, and direct meal observation.

Based on the feeding problems and skill needs, a mean of 16 treatment goals (range 7–24, including increasing independence, utensil use, cup/water drinking, chewing/texture, and medication acceptance) were used to provide individualized treatment. At admission, four children ate regular texture food in limited variety and number (0–3 foods in protein and vegetables; two children ate a variety of fruits and two ate 0–1 in fruit; one child ate no combinations or cooked foods). For the other four children, one could not chew at all and ate lower textures up to fork mashed; one only ate three specific infant dissolvables; one was primarily dependent on 3-month-old infant pouches and chewed some bread-based/snack foods; and one ate soft/wet combinations such as toddler meals or mixed rice dishes. Four children still used baby bottles, and one had just eliminated it a few months prior. Five children were toilet trained, five could speak single or few word requests, two spoke in sentences, and all could walk but one had significant motor impairments requiring assistance. Children were Australian, with caregivers from a variety of Asian, Arabic, European, South American, and Pacific Island ethnicities and nationalities. Socioeconomic statuses varied. Three caregivers spoke English as a second language. Four respondents were mothers and two were fathers. One mother and father completed the surveys together for their two children (siblings). The father participated with the male sibling 1.5 weeks prior to the involvement of the mother and sister.

Sessions were held in home settings with the necessary seating, equipment, and supplies. Each child received intensive treatment over a 2- to 4-week period for approximately 6–7 days per week, with sessions and breaks included across approximately 7–8 h per day. We directly assessed each child's food and tangible preferences, targeted foods from each food group (protein, starch, vegetable, fruit), and matched the spoon size and food texture to individual needs. Treatments were behavior-analytic and individualized with components selected from well-established, empirically-supported treatments such as differential reinforcement and escape extinction based procedures (Kerwin, 1999; Sharp et al., 2010; Sharp, Volkert, et al., 2017; Volkert & Piazza, 2012). We trained caregivers using behavioral skills training and generalized the protocol. Three children participated in restaurant meals. After discharge, all but one caregiver participated in remote immediate follow-up for 2 weeks including sharing videos all meals, meal pictures, and data. We presented discharge social validity (overall program satisfaction and acceptability) and outcome data for five of these participants in a previous group report (see Taylor & Taylor, in press, for further method details).

2.2 | Measures

The surveys consisted of eight items similar to the abbreviated acceptability rating profile (AARP; Tarnowski & Simonian, 1992) and two items similar to those from the IRP-15 (Martens et al., 1985) on a Likert-type scale ranging from 1 to 7, totaling 10 items. We added an *open-ended question* to obtain cultural information, an item to cover the importance of the goals dimension of the definition of social validity, and an item to obtain information on the balance between minimizing potential side effects with treatment effectiveness and efficiency. All question blocks provided space for open-ended text labeled "Any additional comments?" Table 1 provides the survey questions used. Full surveys are provided in Supplementary Information 1.

There were three separate surveys based on individualized treatment components children required. Table 2 provides the lay descriptions of the treatment components used in the surveys. For treatment components, further operational definitions of the targets and treatments and citations are provided in Supplementary Information 2. The

TABLE 1 Treatment acceptability survey questions

1 = strongly disagree; 7 = strongly agree

My child's feeding issues are an important goal/problem to treat

1 = minimizing possible/temporary increases in crying/tantrums during treatment

7 = how well the treatment works and how quickly it works

What is more important/preferred for you in treatment?

1 = strongly disagree; 7 = strongly agree

Rate your treatment preference for [treatment]

1. This is an acceptable treatment for my child's feeding problem

2. This treatment should be effective in changing my child's feeding problem

3. My child's feeding problem is/was severe enough to justify the use of this treatment

4. I would be willing to use this treatment with my child

5. This treatment would not have bad side effects for my child

6. I like this treatment

7. The treatment is a good way to handle my child's feeding problem

8. Overall, this treatment would help my child

9. I would recommend this treatment to other parents

10. This treatment would quickly improve my child's feeding problem

Please write any additional comments on how specific treatments fit in with your cultural beliefs/practices

Please write any additional comments

initial *General Treatment Preferences* admission survey covered attention and tangible treatments, initial escape extinction components (nonremoval, re-presentation; exit criterion was added after), and fading. The other two surveys (*Acceptance Procedures* or *Clean Mouth/Swallowing Procedures Treatment Preferences*) were only given to caregivers if additional treatment components were required (finger prompt/side deposit targeting acceptance, or packing treatments such as redistribution targeting clean mouth). These subsequent surveys also covered all components covered in prior surveys, but in order to reduce caregiver response effort and time and survey length, caregivers gave one overall rating item for each component rather than the caregiver having to complete all 10 items for each one again.

All caregivers completed the initial admission General Treatment Preferences survey (prior to starting the program, typically within 2 weeks). They completed this after the initial consultation (which included explanations and demonstrations of the treatment components and opportunity to ask questions), along with other tasks and forms in preparation for the program, and before direct sessions began with their child. If no further acceptance or packing components were required, caregivers completed this same general survey again at *discharge* (typically within 2 weeks).

Caregivers completed the Acceptance Procedures or Clean Mouth/Swallowing Procedures surveys if these treatment components were required during the program, prior to the components being implemented. This occurred during the program after procedures in the initial general admission survey (attention and tangible treatments; nonremoval, re-presentation) had been implemented with their child, after availability of individualized progress data on those initial treatment components, but before caregiver training or implementation. Prior to completing the surveys, we explained the procedures to caregivers with an opportunity to ask questions. For some components that involved physical aspects, we demonstrated the procedure and showed them the equipment (e.g., infant gum brush, finger guard). They completed the same terminal survey again at discharge. Three children required additional components: one for Acceptance (finger prompt/side deposit), one for Clean Mouth (fading, lowering texture, move-on, redistribution), and one for both Acceptance and Clean Mouth (finger prompt/side deposit, move-on, redistribution). Zero children in this report had chasers for packing or money as a form of tangible contingent access.

T A B L E 2   Treatment component descriptions in surveys

Treatment components

  Differential attention

    ○ Praise such as "great job taking that bite, well done swallowing"

    ○ Ignoring/not reacting such as not coaxing, not telling off/reprimanding, not comforting, not threatening) (attention extinction)

  Rewards/incentives (for children who value/understand them):

    ○ Earning electronics (e.g., iPad, TV, videogames)

    ○ Earning favorite toys/items, activities, prizes (other)

    ○ Earning favorite foods/snacks/desserts/drinks (edibles)

    ○ Earning money (for children who value/understand it)

    ○ Throughout the meal having free/continuous electronics, music, toys/items/activities

  Escape extinction

    ○ Exit criterion (having to finish a set amount of bites/drinks or meal plate amount before leaving the table/ending the meal)

    ○ Nonremoval (hand-over-hand help, keeping the spoon/bite/cup/drink at lips following head until bite/drink is taken)

    ○ Re-presentation (giving bite/drink back if it is spit out)

  Fading (making gradual changes such as blending/mixing, easier/smaller/less bites/drinks, easier textures, empty spoon/cup practice, going slower/backing up)

  Additional acceptance procedures if needed (for not taking or opening for the bite, clenching)

    ○ Finger prompt (putting index finger into the cheek)

    ○ Side deposit with fingers (putting the bite into the cheek) (manual)

    ○ Side deposit with baby gum brush (rolling the bite onto tongue or into cheek with a baby gum brush)

  Additional swallowing (clean mouth) procedures if needed (for packing: not swallowing, holding/pocketing food/liquid in the mouth/cheek)

  Move-on (giving the next bite instead of waiting to swallow every bite)

  Lowering texture (to purees/mashed/blended/baby food)

  Chasers

    ○ Food (giving a food they are willing to take and swallow)

    ○ Liquid (giving a drink they are willing to take and swallow)

  Redistribution (moving bite in mouth back to molars to chew or putting onto tongue to swallow)

    ○ Redistribution with fingers (manual)

    ○ Redistribution with baby spoon

    ○ Redistribution with baby gum brush

Caregivers completed the surveys independently via an electronic online survey link through Zoho Survey sent via email. One caregiver requested informal English language assistance from the first author while filling out the initial admit survey because of the technical and novel nature of the topics. She spoke, read, and wrote in English so we did not use formal translators or interpreters for any other areas of participation in the program. After initial surveys were completed, prior to the treatment being implemented, the first author reviewed them with the caregivers to collaborate, providing further opportunity to ask questions or receive further demonstration or information. For all initial surveys, caregivers would not have observed or used the treatment components as this was prior to implementation and caregiver training. For the discharge surveys, all caregivers already participated in individualized behavioral skills training on the mealtime protocol, were feeding meals alone, and had received their discharge summaries with full progress data. The discharge survey was provided at the beginning of the caregiver's 2-week

follow-up period after program discharge. Only one child's caregivers needed to implement acceptance and clean mouth procedures with their child (the other children no longer needed the procedures).

For data analysis, we calculated average scores (total summed score divided by the number of items). For software, we used Excel and SPSS 26 to analyze and graph the data.

3 | RESULTS

All caregivers on all surveys at all time periods rated 7 out of 7 on the importance of the feeding goal (Table 3). Regarding the balance of minimizing side effects to effectiveness and speed (Figure 1), ratings leaned toward effectiveness and speed (four and over), and this increased over time (Discharge $M = 6.5$) for all but one caregiver (consistent at 4).

In the tangible category, although we included in the instructions "for children who understand and value them," ratings were low for tangible contingent access to money (Table 3). No children in our sample understood or valued money. Thus, we presented average results examining tangible without money included to prevent skewing of this entire treatment category.

For the broader categories of treatments (attention, tangible, escape), average ratings were high (above 6.3) for all time periods for all categories (Figure 2a), and 6.8 at discharge. For fading, one caregiver gave a moderate rating of 4 in the pre-acceptance procedures survey and one gave a rating of 5 upon admission (Figure 2b).

For specific components of general treatment categories, average ratings were high for praise (above 6.8) for all time periods, and high for attention extinction (above 6.5) except for upon admission ($M = 5.3$, one rating at 2, two ratings at 4; Figure 3a). Average ratings for nonremoval were all high (above 6.4) as well as for re-presentation (above 6), and were high at 6.8 at discharge (Figure 3b). Ratings for tangible components were more variable (Figure 4). Noncontingent access (Figure 4b) was rated low at 1 by two caregivers upon admit, and upon discharge by 3 caregivers, in addition to lower/moderate ratings of 3 and 4. Average ratings for contingent tangibles (Figure 4a), were high (above 5.8), but electronics received some lower ratings upon admit and discharge, and edibles had some lower ratings on admit (increased at discharge).

Acceptance procedures were highly rated across all time periods (above 6, Table 3). Ratings did not differ between different types of acceptance procedures. Upon discharge, they were all rated high at 6.7 on average. Regarding clean mouth procedures (Table 3), most ratings increased at discharge, and all ratings were above 6 at both time periods, with the exception of an initial redistribution rating of 5.6. Discharge ratings were high at 7/7 for move-on and manual redistribution.

Table 4 reports open-ended responses from caregivers that chose to respond to these questions (recall that open-ended questions were not compulsory). Responses aligned with quantitative data, such as importance of the goal, the shift from minimizing side effects during admission to effectiveness at later time points, and concerns with tangible electronics. Other areas that were indicated as important to parents included a trusting relationship and starting small, but that escape extinction procedures would be necessary. No caregivers responded to the question about cultural beliefs or practices. Caregivers provided more open-ended comments in the initial admission survey compared to subsequent surveys.

4 | DISCUSSION

The aim of this report was to evaluate caregiver treatment acceptability across the range of specific procedures for pediatric feeding disorders, at pre- and post-treatment. Participants were caregivers of eight children with severe pediatric feeding disorders. In alignment with the definition of social validity, we also evaluated the importance of the treatment goal, and the balance of time to effect with possible side effects. We allowed for caregivers to share unique perspectives by including open-ended questions.

TABLE 3 Caregiver mean (standard deviation) and range of ratings across time by treatment component (highest rating = 7)

	Admission	Pre-acceptance procedures	Pre-clean mouth procedures	Discharge
Importance of the goal	7	7	7	7
Time to effect	5.3 (1.3), 4–7	6.7 (0.5), 6–7	6 (1.4), 5–7	6.5 (1.1), 4–7
Differential attention	6.5 (0.4), 5.8–7	7	6.8 (0.4), 6.5–7	6.8 (0.4), 6–7
• Praise	6.8 (0.7), 5–7	7	7	6.9 (0.4), 6–7
• Attention extinction	5.3 (1.8), 2–7	7	6.5 (0.7), 6–7	6.8 (0.5), 6–7
Tangible	6.5 (0.5), 5.8–7	6.6 (0.5), 6.25–7	7	6.8 (0.4), 6–7
• Contingent electronics	6.3 (1.2), 4–7	7	7	5.8 (2.1), 1–7
• Contingent other (toys, items, activities, prizes)	6.5 (0.8), 5–7	7	7	6.1 (2.1), 1–7
• Contingent edibles	5.8 (1.9), 2–7	7	7	6.8 (0.7), 5–7
• Contingent money	3.1 (2.9), 1–7	1	3 (2.8), 1–5	3.8 (2.5), 1–7
• Noncontingent tangibles	5.1 (2.6), 1–7	5.5 (2.1), 4–7	7	3.9 (2.8), 1–7
Escape extinction	6.4 (0.4), 5.8–7	7	6.3 (1.1), 5.5–7	6.8 (0.5), 6–7
• Nonremoval	6.4 (0.5), 6–7	7	6.5 (0.7), 6–7	6.8 (0.5), 6–7
• Re-presentation	6.1 (0.8), 5–7	7	6 (1.4), 5–7	6.8 (0.5), 6–7
Fading	6.6 (0.8), 5–7	5.5 (2.1), 4–7	6.4 (0.9), 5.7–7	6.8 (0.4), 6–7
Acceptance procedures	–	6.6 (0.6), 6.2–7	6 (1.4), 5–7	6.7 (0.6), 6–7
• Finger prompt	–	7	6 (1.4), 5–7	6.7 (0.6), 6–7
• Manual side deposit		7	6 (1.4), 5–7	6.7 (0.6), 6–7
• Brush side deposit		7	6 (1.4), 5–7	6.7 (0.6), 6–7
Clean mouth procedures	–	–	–	–
• Move-on	–	–	6 (0.7), 5.5–6.5	7
• Lower texture			6.5 (0.8), 5.9–7	6.7 (0.5), 6.3–7
• Chasers			6.1 (1.3), 5.2–7	6.5 (0.7), 6–7
○ Solid			6.5 (0.7), 6–7	6.5 (0.7), 6–7
○ Liquid			6.5 (0.7), 6–7	6.5 (0.7), 6–7
• Redistribution			5.6 (2.1), 4.1–7	6.4 (0.9), 5.7–7
○ Manual			6 (1.4), 5–7	7
○ Spoon			6 (1.4), 5–7	6.5 (0.7), 6–7
○ Brush			6 (1.4), 5–7	6 (1.4), 5–7

At admission, caregivers unanimously gave strong ratings on the importance of the feeding goal (7/7), speaking to the severity of their child's feeding problem. In addition, caregivers preferred that treatment be effective and quick, compared to minimizing side effects, with this preference increasing over time (6.5/7 at discharge). Of the procedures surveyed, four treatment components were experienced by all caregivers in the sample including: differential attention, contingent tangible reinforcement, nonremoval of the spoon, and re-presentation. All of these procedures were already rated highly (over 6/7) at admission, but scores increased further at discharge (6.8/7). The procedures to score slightly lower at admission were differential attention (attention extinction) and tangible (contingent edibles). Interestingly, escape extinction procedures (i.e., nonremoval, re-presentation) consistently received high scores at
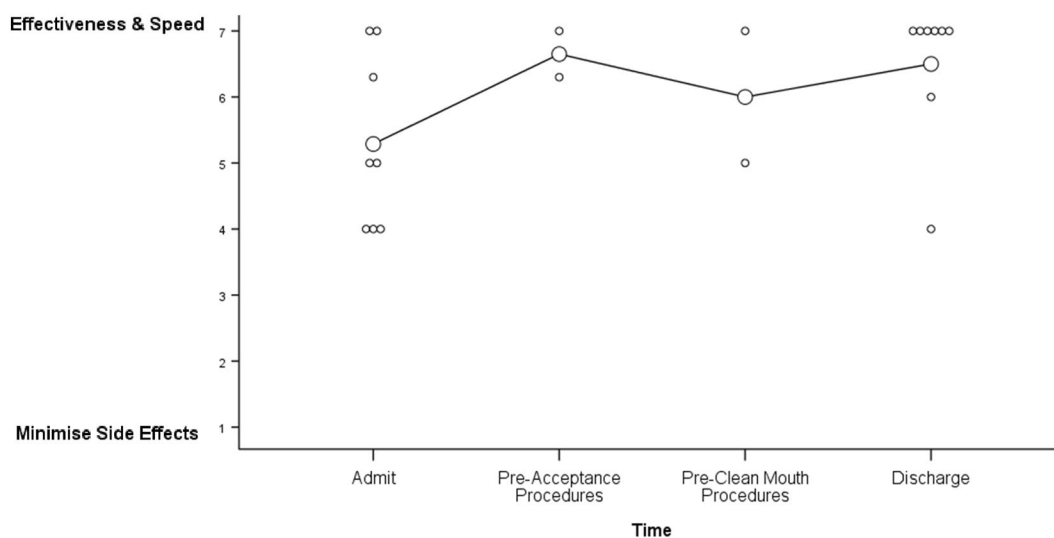
FIGURE 1 Balance between minimizing possible/temporary increases in crying/tantrums during treatment (1) to how well the treatment works and how quickly it works (7) ratings over time. Larger circle markers depict the mean

both admission and discharge. Results from post-treatment surveys indicated that preference for procedures generally strengthened after experience with the procedure except for tangible electronics.

Some of the surveyed procedures were not experienced by all caregivers in the sample, but provide interesting data nonetheless. Contingent access to money was the lowest rated procedure, but this was likely due to lack of relevance to the children in the sample, and thus the question was removed from the average for the tangible treatment category. Further, noncontingent reinforcement (e.g., continuous access) obtained some of the lower ratings at both time points, as well as fading (e.g., gradual changes) prior to discharge. This is an interesting finding given that these procedures are considered least intrusive and may be commonly used by families in general. Prior to admission, the children in this report required "screen time" electronics such as iPad or television throughout meals, and caregivers expressed wanting to remove reliance on these "distractions."

While we have limited data, caregivers of children receiving specific additional procedures for acceptance or clean mouth also provided high acceptability ratings for these procedures at both time points. The only exceptions was the initial rating for redistribution in general, but these ratings were high at discharge. As with nonremoval and re-presentation escape extinction procedures, pre-acceptance physical guidance procedures (i.e., finger prompt, side deposit) consistently received high scores at both pre- and post-treatment. For clean mouth procedures, move-on and manual redistribution were rated highest at discharge.

Open-ended responses generally supported that caregivers understood survey items, with qualitative responses aligning with quantitative data. In addition, open-ended responses served to highlight unique perspectives of the caregivers with respect to their individual children. These responses were considered supplementary and responses were not required, but this limits data, potentially with respect to culture. Considering fuller analyses, it may be necessary to require these responses at multiple time points, and utilize current systematic qualitative and quantitative methods to analyze the data (e.g., Anderson et al., 2021).

To our knowledge, this is the second report following Taylor & Taylor (in press) to examine social validity in a data-based manner for children with pediatric feeding disorders, this time with a more specific evaluation of treatment acceptability for different specific procedures. This report fills a clear gap in the pediatric feeding literature, as identified by multiple reviews (e.g., Sharp, Volkert, et al., 2017; Tereshko et al., 2021). This report extends previous work, by examining treatment acceptability pre- and post-treatment across the full range of procedures with varied
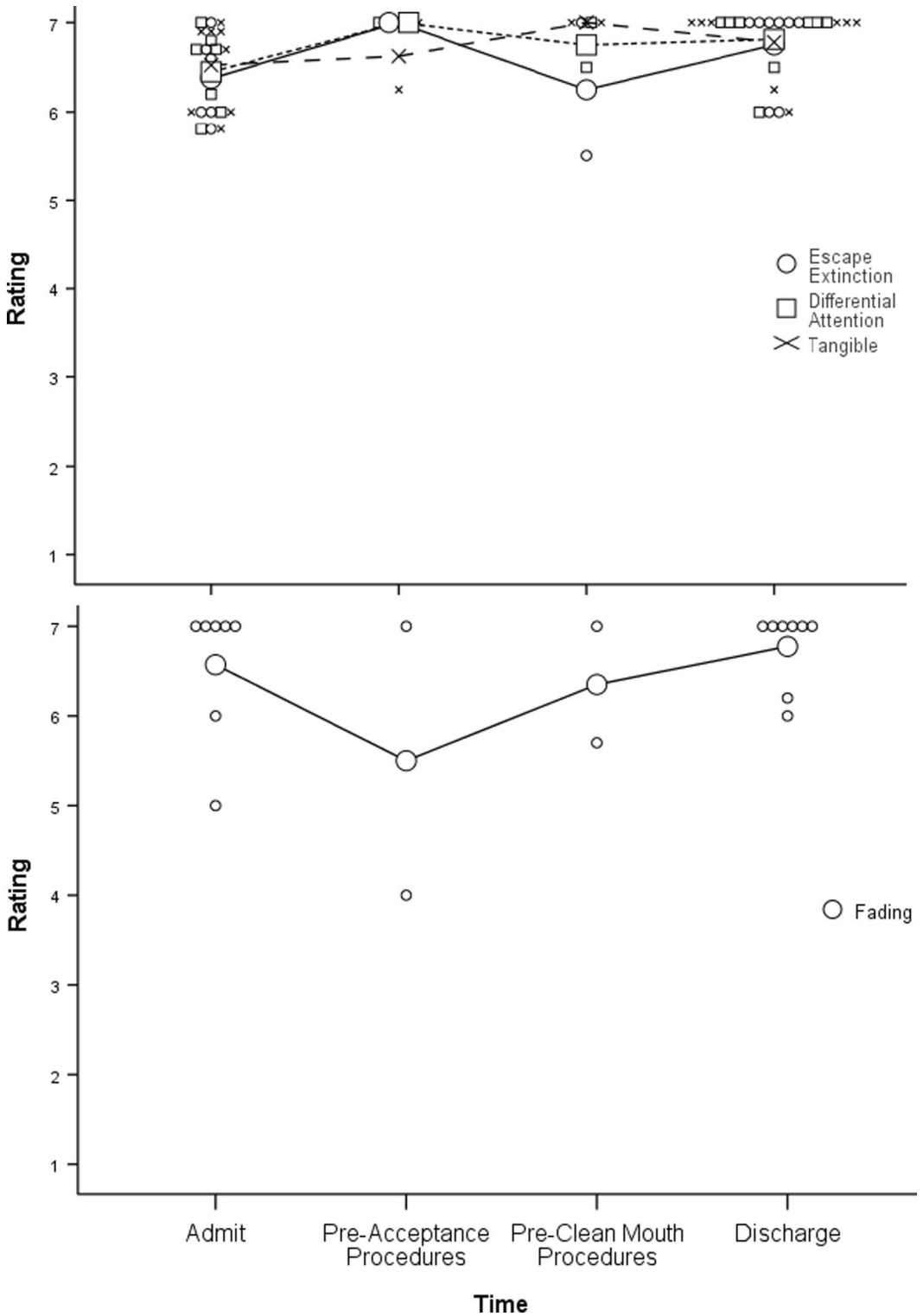
FIGURE 2 Caregiver ratings of general treatment categories from 1 (strongly not preferred) to 7 (strongly preferred) over time. Larger data markers depict the mean
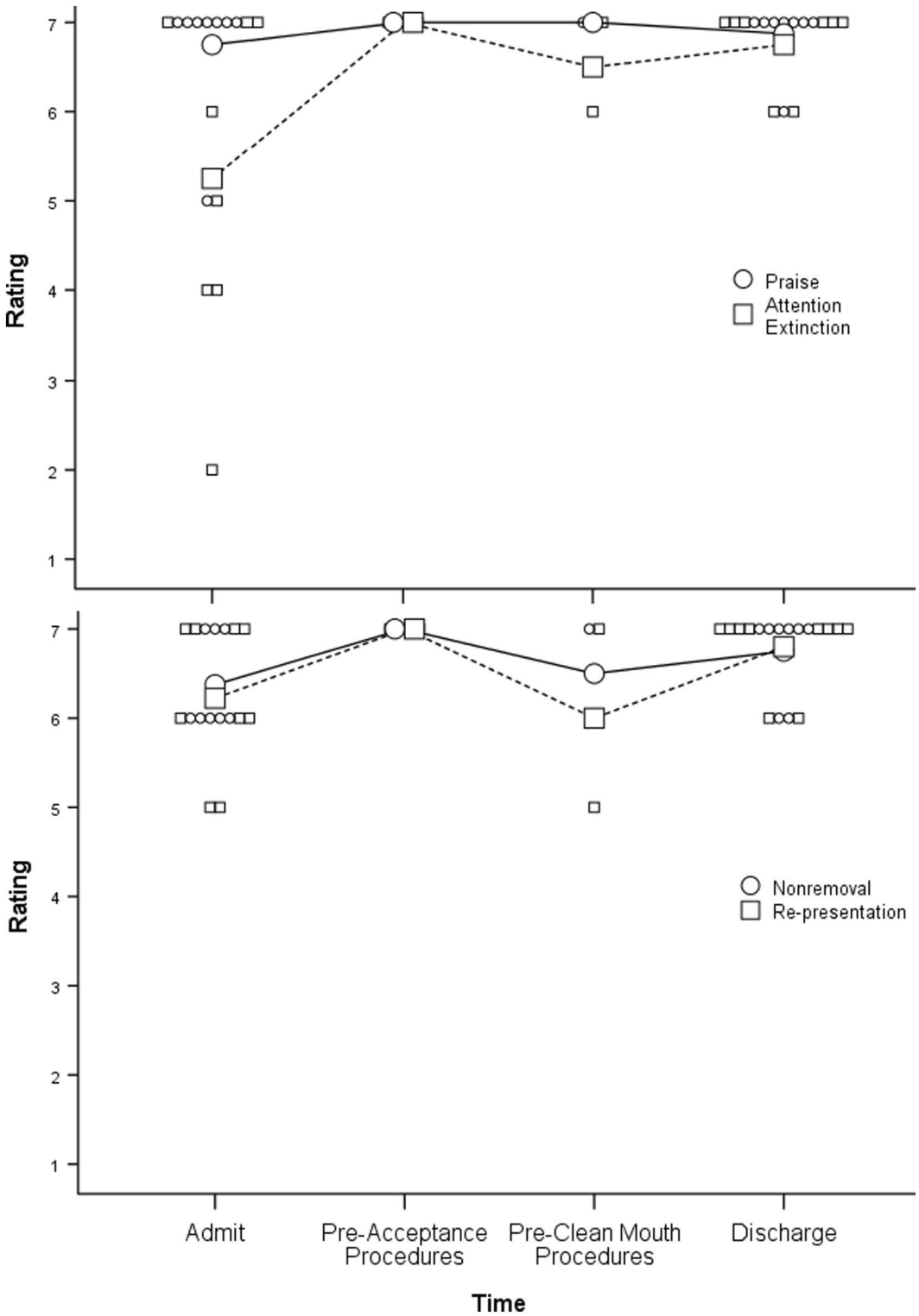
FIGURE 3 Caregiver ratings of differential attention (a) and escape extinction (b) components from 1 (strongly not preferred) to 7 (strongly preferred) over time. Larger data markers depict the mean
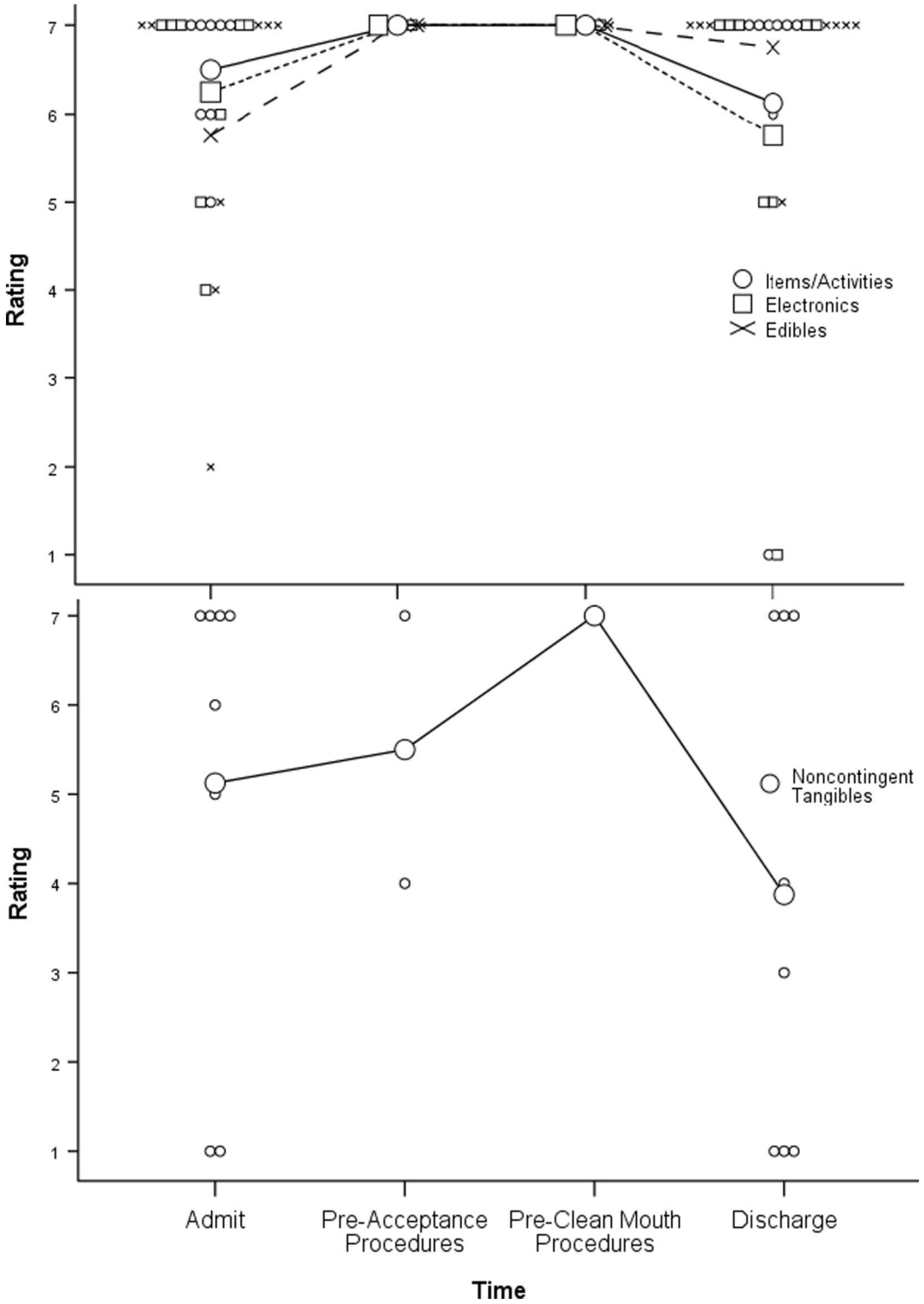
FIGURE 4 Caregiver ratings of tangible treatment components from 1 (strongly not preferred) to 7 (strongly preferred) over time. Larger data markers depict the mean

TABLE 4 Open-ended comments collapsed by theme or intervention type

Item	Response themes
Importance of goal	• Need to overcome sensory issues to progress in life • Food should be a "fun experience" • Multiple health concerns that will benefit from improved diet • Importance of trying new foods, new "eating habits," sitting, and finishing meal independently
Time to effect balance	• Prefer gentle approach to avoid anxiety • Starting "slow and small" • Hope for a "trusting relationship" and learning child's personality • Working together to find the best approach • Feeling informed about added procedures • Desire for treatment to work, while being mindful of how child is feeling, and wanting to support the child. Want to ensure child is not "pushed too far" • Balance between positive reinforcement versus a "firmer" approach
Tangibles	• Reinforcement is required for motivation to learn new skills, but electronics are distracting; not aware of food/taste • Prefer toys over electronics. Want electronics to be faded out • Needs a warning for removal of electronics • Child doesn't understand value of money yet • Believe in a "mixture of approaches" (i.e., varied tangibles/activities)
Differential attention	• May not be understood by child, as well as certain meal instructions • Child responds well to praise and acknowledgment, and requests being "playful"
Escape extinction	• Although "not ideal," will be "necessary" • Mindful of gagging and bringing nonpreferred foods up • Hope that things "could be easier" for child, but trust in professional opinion (pre-clean mouth procedures) • Willing to do "whatever it takes," requirement for "appropriate training"
Fading	• Working up from smaller bites "effective, smart, and safe"
Satisfaction	• More than happy with how treatments have been going thus far (pre-acceptance procedures) • (Discharge): each "approach" was "methodically assessed" and "thought through" • (Discharge): so pleased with quick turnaround from purees to regular texture and eating independently • (Discharge): commitment to using "amazing" protocol "as part of our lives outside program" • (Discharge): packing was difficult, but procedures were what helped (lowering texture)

Note: Responses have been summarized into general themes to preserve confidentiality.

putative intrusiveness, as opposed to a comparison between a few procedures or the treatment program as a whole upon discharge. At post-treatment, ratings also relate to caregiver implementation of the procedures.

While not a focus of the paper, all children in this sample achieved clinically significant levels of increases in consumption, food variety, feeding skills, and age-appropriate eating. The overall course of treatment and the procedures implemented (see Taylor et al., 2020 for further detail) align with current best practice as identified by multiple reviews (e.g., Penrod et al., 2021; Sharp, Volkert, et al., 2017). For example, procedures of higher intrusiveness (e.g., finger prompt) were only implemented following prior procedures, and were combined with reinforcement and demand fading. This intervention model also extends research by focusing on intervention and generalization within the home environment (e.g., Sharp, Volkert, et al., 2017; Tereshko et al., 2021). Discharge social validity ratings were very high across the sample, and this strengthens the overall finding that behavior-analytic treatments are effective and valued by caregivers (Baer et al., 1968; Kerwin, 1999; Volkert & Piazza, 2012). It is important to note that caregiver acceptability when implementing procedures may have been influenced by high levels of comprehensive

training and support across multiple back-to-back meals. Ratings may differ in situations where caregivers need to implement procedures from the outset or with less frequent support.

4.1 | Limitations and future directions

Some limitations of the current report included a small sample size which may have affected our analyses across items. Specifically, only two children received the finger prompt/side deposit procedure, and two received procedures for packing. Owing to the individualized nature of treatment, not all caregivers experienced each procedure, such as the use of chasers or contingent money. Specific to the acceptability of contingent money, all caregivers rated this low, despite the question specifying "for a child that would value and understand it." This question was removed from some analyses as it was not relevant to the children. We do not have information beyond the optional open ended comments suggesting reasons for the low rating, but it may have been that the parent felt it was not relevant to their child and thus the low rating. Alternatively, parents may feel that providing money as a reinforcer is not okay (society rule/expectation). However, in prior cases with money as a reinforcer, discharge social validity ratings were high and caregivers did not report any concerns with using money (Taylor, 2020c; Taylor et al., 2019). Future surveys could involve adjusted wording, or be tailored to the group of participants (e.g., items related to money for older children). While we considered a broad range of procedures, we did not include procedures for teaching chewing, or procedures rarely used in this feeding program such as jaw prompt, chin prompt, flipped spoon, or initial brush presentation. We added exit criterion to escape extinction in future surveys. Future research could also examine different types of noncontingent tangibles separately (e.g., handheld electronics, music, videos, items/activities). Researchers and clinicians could adapt and refine our methods and survey questions for wider use.

Despite the aim to evaluate potential differences across cultures, no caregivers provided open-ended responses to this question, despite being of diverse cultures. This may be improved in making these questions compulsory in future, as well as including cultural fit in the Likert-rated questions. In this sample, three caregivers had English as their second language, which may have affected interpretations, and future evaluations could involve variations in wording, or prompting caregivers to circle any questions not understood, such that these questions can be followed up in a different format.

While we included questions from established psychometric acceptability measures (i.e., AARP, IRP-15), we did not conduct psychometrics for this particular survey due to small sample size and clinical nature of use. In addition, we did not complete scale development steps for wording of the treatment components and parts, such as previous research in this area (Anderson et al., 2021). This could be a direction for future research. In addition, surveys to caregivers for further acceptance or clean mouth procedures (*n* = 3), covered all previous standard components but with only one rating item (i.e., just providing overall ratings for attention extinction and praise rather than all 10 questions for rating differential attention). Thus, ratings at further timepoints and discharge were summarized across less items, versus children that proceeded to the same standard discharge survey (*n* = 5). We did this to reduce length and response effort for caregivers, particularly due to the number of clean mouth procedures. We did not evaluate reliability of surveying all items versus one overall rating. Future researchers with more participants and resources could examine this or use 10 items for all components at discharge and conduct item analyses for all items. Clinicians could use abbreviated one-item surveys in the interest of time, or only use the 10 items for the three broad categories of treatment (attention, tangible, escape) and one item for the specific components.

Repeatedly assessing treatment acceptability across time requires consideration of different factors at various time periods. Previous authors have noted that acceptability ratings may be impacted by order effects (e.g., preference for the later implemented treatment; Ahearn et al., 2001) or the outcomes of treatment in discharge surveys. This article addresses these concerns by evaluating acceptability at the outset of treatment. Nevertheless, our data is primarily from caregivers who pursued participation in this intensive program after procedures were described during the initial consultation. Therefore these caregivers may more highly value the treatment goal. We do not

know if initial pre-treatment ratings differ in populations who do not pursue this treatment program. However, we would not be able to obtain informed personal discharge perspectives from this population as they would not have experienced the treatment process and results firsthand. For populations who do participate in this treatment, future research should also examine treatment acceptability after immediate follow-up (after the initial 2 weeks after the program), and during long term follow-up (months, years after the program) to examine relationships with outcomes and improvements in quality of life. Additionally, caregivers rated additional required procedures to address non-acceptance and packing following previous attempted components, which may have increased ratings (e.g., Ahearn et al., 2001). Future research could also add a time period after attention and tangible treatments, before the implementation of escape extinction treatments. Future research could also add additional time points, prior to caregiver training and caregiver implementation.

A final note is that surveys were administered by the clinician and non-anonymized, thus we recognize that there could be reactivity in responding (e.g., Snodgrass et al., 2018). However, anonymizing survey responses in this sample would have prevented the administration and analysis of surveys required at certain time points (e.g., non-acceptance procedures). Anonymized surveys may be an opportunity for future research in larger programs, as well as evaluating social validity measures appropriate for the participants themselves (e.g., modified surveys, intervention choices, or direct observation methods).

Importantly, this program may be more intensive and briefer in duration than the more widely available behavior-analytic interventions for pediatric feeding disorders. From the current literature we are not able to examine the potential role of intervention intensity (along with outcomes) on social validity within pediatric feeding treatments and this could be a potential area for future research, particularly in programs offering varying intensity levels (e.g., outpatient vs. inpatient). The process applied in this report may be utilized by other behavior analysts who seek to examine treatment acceptability more closely.

In closing, this report provides a novel evaluation of social validity in the treatment of pediatric feeding disorders. Results highlight the importance of treatment goals and the balance of time to effect with potential side effects. From a clinical perspective, examining treatment acceptability at admission also provided caregivers with information regarding the range of treatment possibilities, and prompted further collaborative discussion of unique considerations such as effectiveness and efficiency versus side effects.

Interestingly, procedures often considered "most intrusive" were highly rated by caregivers, especially in comparison to procedures often considered "least intrusive." Using a data-based approach with the perspectives of caregivers actually experiencing treatment is vital. While it has been claimed that caregivers experience "discomfort" with extinction procedures, the current data provided here, and in Taylor & Taylor (in press) suggests otherwise. Further, the large body of outcome data asserts that escape extinction is a key function-based treatment component (Bachmeyer et al., 2009; Berth et al., 2019; Cooper et al., 1995; Gonzalez et al., 2014; Kirkwood et al., 2021; Piazza, Fisher, et al., 2003; Piazza, Patel, et al., 2003; Reed et al., 2004; Sharp et al., 2010). We do note however that this sample represents children with prolonged and severe feeding disorders, and acceptability ratings could be different for caregivers of children with milder feeding problems seeking treatment earlier. In addition our sample does not include children with severe medical conditions or tube dependency, and further evaluations could be required. Nevertheless, the available social validity data centers on severe feeding disorders and corresponds with our findings (e.g., Laud et al., 2009; Rubio, McMahon, et al., 2020; Rubio, Volkert, et al., 2020; Taylor et al., 2017; Woods & Borrero, 2019).

Overall, strengthening research in the area of treatment acceptability for pediatric feeding procedures will serve to improve efforts to accurately disseminate our science to consumers, to other disciplines, and those responsible for policy change, particularly in international countries (Taylor & Taylor, 2021a, 2021b). Dissemination is also important within the field to behavior-analytic practitioners, to further communicate the acceptability and effectiveness of certain procedures. Doing so may increase opportunities for training and supervision in pediatric feeding.

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DATA AVAILABILITY STATEMENT

Research data are not shared.

ORCID

Tessa Taylor https://orcid.org/0000-0001-8643-3955
Sarah Ann Taylor https://orcid.org/0000-0002-3236-1287

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