ABSTRACT

Objective: To better understand caregivers’ decisional processes related to offering novel and disliked foods to their infants and toddlers.

Design: As part of a parent study on young children’s food acceptance that took place in Denver, CO, this secondary analysis used a basic qualitative approach to explore caregivers’ decisional processes related to repeated exposure and children’s food rejection.

Participants: English-speaking caregivers of infants and toddlers (aged 6–24 months; n = 106) were recruited via flyers and social media and interviewed (from July, 2017 to January, 2018) during a laboratory visit focused on introducing a novel food.

Phenomenon of Interest: Factors influencing caregiver decisions to (dis)continue offering novel or disliked foods.

Analysis: Using a combined deductive and inductive coding approach, trained researchers coded transcripts and codes, which were reviewed and discussed by all investigators to identify themes.

Results: Three major themes (and 2 subthemes) were generated regarding caregivers’ decisions about re-offering rejected foods: 1) Caregivers understand that multiple experiences with new foods are needed because children’s reactions can be unpredictable and depend upon time, developmental stage, and child traits; 2) Caregivers vary in their persistence and decisions to keep offering foods depending on responsiveness to child cues (sub-theme) and adult-centered beliefs, needs, and decisions (sub-theme); 3) Child food acceptance will change with time, circumstances, and development if you keep trying.

Conclusions and Implications: Although caregivers are aware of repeated exposure, additional implementation research focused on translating theory into effective home practices could assist caregivers to persist in offering novel or disliked foods.

Key Words: food rejection, infancy, complementary feeding, repeated exposure, caregivers (J Nutr Educ Behav. 2024;000:1–13.)

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children are seeking to master self-feeding and autonomy, but their skills for independent self-feeding are underdeveloped.\textsuperscript{9} On the other hand, caregivers have competing time demands and need feeding (which happens multiple times each day) to have some efficiency and limited cleanup.\textsuperscript{10} This sometimes creates a competitive scenario that can result in conflictive feeding occasions during which the child and caregiver alike are frustrated—hardly the positive mealtime scenario, which is thought to support acceptance of new flavors and foods.

An approach to promote food acceptance often referred to in the literature is that of repeated exposure to flavors, a strategy that results in increased familiarity and preference for novel and disliked foods among young children.\textsuperscript{11} The success of this strategy has been demonstrated consistently, and a variety of foods and flavors (eg, green beans, artichokes, peaches, and protein hydrolysate formula) have been tested in infants.\textsuperscript{11–15} However, the translation and adoption of repeated exposure paradigms by caregivers of infants and toddlers beyond the laboratory and into the home setting is less well defined. The complementary feeding period represents the transition from an exclusively milk-based diet to semisolid and/or solid foods and is recommended to begin in infancy at about 6 months old. Although caregiver feeding practices during the early complementary feeding period have been the focus of some inquiries, the challenge of introducing new foods during toddlerhood (eg, aged 12–24 months) remains. A full understanding of the strategies caregivers employ to assist their children in accepting new foods during this period has not been the focus of most inquiries into this topic.

Many qualitative inquiries regarding children’s food acceptance have focused on parents of preschoolers and school-aged children. These studies have elucidated many barriers caregivers face when offering and reoffering foods to their preschool children. Time constraints, financial costs, and children’s picky eating have been identified as barriers to offering healthier foods (ie, vegetables) to children of this age.\textsuperscript{16–18} Caregivers of preschoolers also have mentioned that child tantrums and children’s general dislike of some foods can prevent them from reoffering rejected foods to their children.\textsuperscript{16} Furthermore, parents of children who are more neophobic have been reported to employ fewer limits (eg, resorting to cooking special meals for children and offering other foods in place of rejected foods) and to focus more on what children like and are willing to eat.\textsuperscript{19} Finally, to build food acceptance, caregivers must balance their children’s demands and preferences with their own needs, such as time constraints and financial costs.\textsuperscript{17}

Caregivers of infants and toddlers likely face similar challenges to those described above and additional barriers that are unique to their young child’s developmental stage: an emerging sense of autonomy, a need to practice self-feeding skills, limitations in verbal communication, and complete reliance on the caregiver to provide foods with proper nutrition. However, fewer inquiries have been conducted regarding the influences on the decisions of caregivers during the complementary feeding period. One qualitative evidence synthesis reports on decisions regarding when to initiate complementary feeding, parent engagement and prior experience with feeding infants and toddlers, and sources of guidance (peers, family, professionals, etc) but does not include inquiry into food rejection and strategies to achieve food acceptance.\textsuperscript{20} Although the literature recognizes the effectiveness of strategies such as repeated exposure for building food repertoire, it seldom focuses on the decisional processes of the key actors (ie, caregivers of infants and toddlers).\textsuperscript{21}

Thus, the Good Tastes Study aimed to build on previous efforts by other researchers that focused on parent feeding strategies with children aged ≥ 2 years.\textsuperscript{16,22} and explored caregivers’ decisional processes, beliefs, and strategies related to offering infants and toddlers (aged 6–24 months) novel and disliked foods, how they handle their child’s food rejection when they continue offering (or not) a previously rejected food, and what could influence them to try offering a rejected food again. Basic qualitative inquiry through brief interviews was chosen for this work as it allowed caregivers to express, in their words, their thoughts and decisions about feeding infants and toddlers. The aim also included understanding the barriers and facilitators to use strategies for repeated exposure in the home setting during the complementary feeding period, when caregivers are first introducing foods to their infants and toddlers.

MATERIAL AND METHODS

Study Design

The Good Tastes Study, the parent study from which these data were collected, was a cross-sectional study conducted in the Denver metropolitan area that aimed to examine caregiver-child interactions when caregivers (94% mothers) offered tastes of a bitter-tasting green vegetable (pureed kale) to their infants/toddlers (ClinicalTrials.gov no. NCT04549233).\textsuperscript{23} The age range of 6–24 months was chosen because of the rapid eating-related development that occurs, because it includes the onset of child neophobic responses, and because the literature is not as well developed with regard to parent feeding strategies for this specific age group.\textsuperscript{24} A qualitative component was chosen to assess caregivers’ perspectives on repeated exposure influences on infant and toddler food acceptance and to delve into how caregivers make decisions about how and when to offer and/or reoffer initially rejected foods. The study was conducted between July 2017 and January 2018.

For the Good Tastes Study, caregivers were invited to The Children’s Eating Laboratory and participated in a scenario that was intended to prime them to think about how they respond when their child rejects a food. To begin, they offered a novel, bitter food to their child, and then they were asked to articulate their decisional processes related to offering such foods when they were feeding their child at home. This scenario was used, in part, to evoke responses that were grounded in or consistent with how they approach this task at home and to try to reduce social desirability in their responses.
Participants

Parent-child dyads (n = 106; girls [n = 49] and boys [n = 57] aged 6–24 months) were recruited via a university listserv, community flyers, snowball sampling, and social media to participate in a single laboratory visit. Given that the parent study was exploratory and hypothesis-generating in nature, no power analysis was conducted a priori. A goal of 100 dyads, evenly distributed across 2 age groups (infants and toddlers), was proposed to accommodate the considerable developmental change that occurs across this age range. Dyads were recruited and stratified into 2 groups: (1) infants (aged 6–12 months) and (2) toddlers (aged ≥12–24 months), to capture the spectrum of eating development that occurs across this age range and to explore potential differences in caregivers’ attitudes and practices related to repeated exposure of novel and disliked foods for infants and toddlers. Inclusion criteria for the study included having a child between the ages of 6 and 24 months who had been introduced to at least one complementary food, was typically developing, and having a caregiver who was able to converse in English and was aged between 18 and 51 years. Exclusion criteria included a history of food allergy in the child, feeding issues or medical conditions that influenced children’s eating, and birth at gestational age <37 weeks. After supplying information about the study and answering caregivers’ questions, caregivers provided written informed consent for their and their children’s participation in the study. A total of 113 caregivers were screened; 109 were determined to be eligible (3 children did not meet the age criterion, and 1 had other medical conditions), and 106 were enrolled (3 dropped with no reason given).

Procedure

During the feeding interaction portion of the laboratory visit, caregivers offered up to 4 tastes of a familiar food (infant cereal) and 8 tastes of kale purée. Caregiver-child interactions were video-recorded, and caregivers also completed background questionnaires, which included demographic information (more details regarding study procedures can be found in24). Briefly, demographic information was self-reported and included caregiver age, caregiver relationship to the child (mother, grandmother, father, grandfather, other relation [write in]), caregiver and child race (American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, Black or African American, White, more than one race), caregiver and child ethnicity (Hispanic, Not Hispanic), caregiver education, and income, child age, sex of the child (male, female).

After finishing the tasting protocol, caregivers participated in a brief interview and were asked questions focusing on their beliefs and practices regarding introducing novel and disliked foods to their child, with a specific inquiry regarding caregivers’ practices related to repeated exposure and its relation to child food acceptance.25 A basic qualitative approach was chosen to explore and learn from caregivers, in their words, how they feel and think about trying to introduce novel and disliked foods to their children. Brief interviews were chosen over more time-intensive interviews to balance the desire to gather participants’ thoughts and opinions via open-ended questions with the need to be cognizant of participant burden and the length of the visits (particularly for caregivers with toddlers).26 Participants (caregiver and child) height/length and weight were collected at the end of the visit, and methods have been described previously.24 The participant payment for the entire protocol was $50. The study protocol was approved by the Colorado Multiple Institutional Review Board (protocol no. 15-2437) as an expedited review protocol.

Research Instrument

One-on-one brief, individual interviews consisting of 5 questions were developed to enable caregivers to (1) share their personal experiences with child feeding, (2) allow them to articulate beliefs about repeated exposure, and (3) tell us how they made decisions about continuing to persist in offering initially rejected foods. The brief interview guide was developed by a multidisciplinary team with expertise in nutrition, parent, child development, and qualitative methodology. The semistructured interview guide contained open-ended questions that assessed caregivers’ decision-making related to offering food, their intentions to reoffer food in the future, experiences when their child rejected foods, whether they believed their child would change in the future, and how they would describe their child as an eater (eg, Do you think your child is a good or a difficult eater?). Open-ended questions were followed with probes when clarification was needed. The brief interview guide is shown in the Figure.

Interviews were performed by 1 of 2 lead researchers (ie, the individual who took the lead for each study visit), both of whom had experience working with caregivers and young children. Following initial interviews, the phrasing of several questions was refined to improve clarity (eg, modifying the phrase: “parents tell us it is really hard for them” to say “some parents tell us it is really hard for them”). Field notes that described any notable aspects of the interview (eg, the child became impatient or was not feeling well that day) were noted in a Day of Visit form. The average time for the interviews was about 5 minutes, with a range of 1–10 minutes. Each interview was audio-recorded and then transcribed verbatim and uploaded into Atlas.ti (version 8.1.28, ATLAS.ti GmbH Scientific Software Development) for coding.

To achieve rigor and reproducibility in the qualitative data collection process the following procedures were followed: (1) the use of underlying theory of repeated exposure to develop the study design, and (2) use of an interview guide so that questions to all respondents were asked (Figure), (3) logging of each step of the qualitative process, (4) training of 2 independent coders, and (5) specific team discussions to address potential research bias regarding interpretation of data (to address reflexivity).27 The research team discussed both clinical and research experiences (as nutritionists, dietitians, and child development experts) that potentially influenced our knowledge and values related to feeding practices for infants and toddlers. Throughout the study, an awareness
of the potential bias of our caregiver roles was reflected on.

Analytic Approach
A combination of inductive and deductive analytic approaches was employed, and consensus coding was undertaken to code the data systematically.28 At the outset, participants’ responses were transcribed, verified, and then assigned individual identifiers, which also included the age category of the child (eg, infant [1] or toddler [2]). Next, 10 of 106 interviews (5 from caregivers of infants and 5 from caregivers of toddlers) were read several times and discussed by 2 members of the research team to begin to make meaning of the data, to relate the data to previously identified theoretical concepts (eg, repeated exposure), and to inform the development of initial categories of codes.29 Codes and subcodes were identified and assigned a definition, and each definition was aligned with ≥ 1 exemplar. Two student researchers were then trained to learn the codes and their definitions and then to apply the codes to the transcripts.30 Each student proceeded to independently code all transcripts from the brief interviews (n = 106) in groups of 10 transcripts/wk. After the first 10 transcripts were coded, the full team met to determine the need to add additional codes and exemplars and to refine the code book and definitions. After that, the research team met weekly to discuss whether additions were needed and to discuss disagreements between the coders until consensus was achieved and all resolutions were tracked in 1 document to which the coders could refer. After all transcripts had been coded, identifying themes was undertaken. The team read and reread the data for each code, grouped codes into nodes (concepts), and then met for in-depth discussions of nodes to identify patterns and major themes and to more fully understand linkages among codes. In addition to discussing the data by node, the data were also examined by participant identifiers to determine whether differences were noted in connection with the ages of the children (infant and toddler). Memos were written independently by each team member that focused on related and intersecting codes, and these were reviewed against selected Atlas.ti codes. Then, themes were identified, and to ensure that the themes reflected an accurate depiction of the entire set of interviews, the lead investigator then reread each of the transcripts, reviewed the team memos, and subsequently verified the overall themes.

Discussion by all team members occurred to place the findings into the context of the greater literature.

RESULTS
Participant demographic characteristics are presented in Table 1. Caregivers of infants and toddlers (n = 106; 53% male children; mean age, 13.4 months) participated in the overall study and the brief parent interviews. Parents (94% mothers, 5% fathers, and 1% legal guardians) were predominantly non-Hispanic White (82%), had college degrees (90%), and the majority were from middle-to upper-income families. Most children were growing well (90.5% in the healthy weight category).

Caregivers referenced several factors that influenced the decisional processes they applied when continuing to offer foods their children rejected or disliked. These factors differed somewhat in their saliency between caregivers of infants and toddlers. Three main themes and 2 subthemes were identified related to how caregivers decide on whether to continue offering rejected foods to their child: (1) caregivers understand that multiple experiences with new foods are needed because children’s reactions can be unpredictable and depend on time, developmental
Caregivers Understand That Multiple Experiences With New Foods Are Needed Because Children’s Reactions Can Be Unpredictable and Depend on Time, Developmental Stage, and Child Traits

Many caregivers spoke of the strategy of repeated exposure in some way and referenced messages received from health care providers and from reading web-based sources or scientific literature. Caregivers of infants and toddlers both spoke of repeated exposure influences and practices, with some stating that it was necessary because “children just aren’t going to like it the first time.” Caregivers often stated that food rejections are to be expected from young children and that children go through phases and stages in which they are more likely to refuse new and, sometimes, even previously liked foods. Caregivers of toddlers more often attributed this to the age of their child:

I mean he’s a toddler so one day he’s gonna like something and the next day he’ll hate it, so I always just try to keep offering him things. [ID 19_2, caregiver of toddler]

Caregivers also endorsed that children’s behaviors change with time and development. They pointed out that infants and toddlers are only beginning to learn to eat and that the lack of experience with foods, generally, and the frequency of encountering novel foods are often the underpinnings for food rejection. Caregivers frequently stated that through learning and experience, children will adopt new food preferences. “Give it time” was a recurring message.

Caregivers expressed a belief that their child will change because “they are like me” or like their father or another child. Caregivers stated that they (or their child’s father) had been “picky” as children but now ate more variety and expected that their child would follow suit. Many caregivers stated a firm belief that children’s taste buds or palates change over time; the inference was that children undergo physiological taste changes that predispose them, at a certain point in time, to become more accepting of a variety of tastes.

Caregivers of toddlers (compared with caregivers of infants) more often referred to child temperament or their child’s intrinsic nature as predisposing them, at a certain point in time, to become more accepting of a variety of tastes.

Caregivers of toddlers also more often referred to the unpredictable

### Table 1. Characteristics of Caregivers and Children Who Participated in the Good Tastes Study

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean ± SD or n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child participants</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td></td>
</tr>
<tr>
<td>Infants (aged 6–12 mo)</td>
<td>46 (43)</td>
</tr>
<tr>
<td>Toddlers (aged 12–24 mo)</td>
<td>60 (57)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>49 (46)</td>
</tr>
<tr>
<td>Males</td>
<td>57 (53)</td>
</tr>
<tr>
<td>Weight categories</td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>3 (2.9)</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>96 (90.5)</td>
</tr>
<tr>
<td>Overweight/obese</td>
<td>7 (6.7)</td>
</tr>
<tr>
<td>Ever breastfed</td>
<td>103 (98.1)</td>
</tr>
<tr>
<td>Adult participants</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>100 (94)</td>
</tr>
<tr>
<td>Males</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Age (y)</td>
<td></td>
</tr>
<tr>
<td>18–29</td>
<td>25 (24)</td>
</tr>
<tr>
<td>30–49</td>
<td>79 (74)</td>
</tr>
<tr>
<td>Not reported</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>Asian</td>
<td>9 (8.5)</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>White</td>
<td>87 (82)</td>
</tr>
<tr>
<td>&gt; 1 race</td>
<td>6 (5.7)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>9 (8)</td>
</tr>
<tr>
<td>Not Hispanic/Latino</td>
<td>97 (92)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>&lt; High school</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Some college/trade school</td>
<td>7 (7)</td>
</tr>
<tr>
<td>College graduate/postgraduate</td>
<td>96 (90)</td>
</tr>
<tr>
<td>Income ($)</td>
<td></td>
</tr>
<tr>
<td>&lt;31,950</td>
<td>15 (14)</td>
</tr>
<tr>
<td>31,951–60,570</td>
<td>29 (27)</td>
</tr>
<tr>
<td>&gt; 60,570</td>
<td>54 (51)</td>
</tr>
<tr>
<td>Not reported</td>
<td>8 (8)</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>25.7 ± 6.3</td>
</tr>
</tbody>
</table>

Note: Interviews took place with caregivers (n = 106) in the Good Tastes Study, conducted in the Denver metropolitan area.
Table 2. Themes and Exemplar Quotes Determined From Brief Interviews With Caregivers of Young Children (n = 106) Describing Influences on Child-feeding Practices For Novel and Disliked Foods

<table>
<thead>
<tr>
<th>Theme</th>
<th>Exemplars</th>
</tr>
</thead>
</table>
| Caregivers understand that multiple experiences with new foods are needed because children’s reactions can be unpredictable and depend on time, developmental stage, and child traits | “I have read the research [laughing], . . . that shows repeated introductions or whatever it’s called helps then and that it can take from 5−15 times or whatever” [ID 074_1, mother of infant]  
“I’ve read in books that you’re supposed to try to give it to them fifteen times” [ID 083_2, mother of toddler]  
“Babies change their mind all the time about one time they like something and the next they don’t, or they eat it all day, every day, and then they don’t want it” [ID 026_2, mother of toddler]  
“I mean he’s a toddler so one day he’s gonna like something and the next day he’ll hate it, so I always just try to keep offering him things” [ID 19_2, mother of toddler]  
“I just think it depends on age and how your taste buds change and when he kind of gets through this phase of whatever he’s going through at the moment and is like back to being like a little more open about things or is older” [ID 037_2, mother of toddler]  
“Uhhh, that’s not too much of an issue for us because he eats most foods. And I don’t have high expectations of him. I mean he’s only 17 months so” [ID 026_2, mother of toddler]  
“You know she really hasn’t had any food that we’ve offered her that she hasn’t eaten at all or not wanted at all” [ID 037_2, mother of toddler] |
| Caregivers vary in their persistence and decisions to keep offering foods | “Um, I don’t [quit offering]. I just keep giving it to him” [ID 050_1, mother of infant]  
“It just depends on how many times I’ve given it to him . . . we’ve given it to him. Right, so like first introduction, lately it’s been trying to touch it and try to at least expose him to it. See if he had any interest at all, maybe try again one or two more times total” [ID 073_2, mother of toddler]  
“I keep trying. You go for you know a few bites of something that she likes and then maybe see if you can go back” [ID 046_1, mother of an infant]  
“I would give up at that moment and try again a different day. And make it differently or something” [ID 037_2, mother of toddler] |
| Responsiveness to child cues (subtheme)                                | “If he’s acting like that, he just does not like it [Laughing]. We trust him” [ID 058_1, mother of infant]  
“Usually based on his facial. You know based on his facial expression. He’s pretty quick to start crying. The visual cues are pretty obvious I think, when he’s not into it” [ID 046_1, mother of infant]  
“If he had it in something else and likes that food, then I can get him to go back and try it…” [ID037_2, mother of toddler]  
“When he [is] willing to self-feed himself, like self-feeds something, I take that as a pretty good sign that he’s keen on it” [ID 101_1, mother of toddler]  
“Um, If he asks for more. Like if he signs more [American Sign Language for “more”] I’ll give him more” [ID 026_2, mother of toddler]  
“I don’t give her that anymore because she always throws it on the floor, so I assume she doesn’t like it” [ID 102_1, mother of an infant]  
“He’ll try everything, but if he doesn’t like it, he will try to spit it back out” [ID 015_2, mother of toddler] |
| Adult-centered beliefs, needs, and decisions (subtheme)                | “The other thing is, say we’re having a meal with multiple parts, like I’ll just put all 4 or 5 things on his tray and if he’s ignoring something, . . . Um, so, but if he’s not eating something right now then I don’t push it, I don’t make a big deal of it, but then it’s like that’s something that I won’t be giving him the same food, you know, next week, or in the future” [ID 94_2, mother of toddler]  
“If it’s something that we normally eat, he has to eat what we eat because we’re not going to cook him a separate meal” [ID 103_1, mother of infant]  
“It’s been just about whatever we are eating. And even if I guess she doesn’t like the thing and we are eating it or whatever she is still going to be exposed to it” [ID 003_2, mother of toddler]  
“I guess it depends on how much he’s had to eat. So, if I know he’s not full you know, I’ll keep trying. If he’s full, I’ll try again a different meal” [ID 086_2, mother of toddler]  
“I was a really picky eater as a kid, so I kind of look for textures” [ID 056_2, mother of toddler] |

(continued)
Table 2. (Continued)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Exemplars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child food acceptance will change with time, circumstances, and development if you keep trying</td>
<td>“We’re not gonna really take anything off the menu unless he’s allergic to it” [ID 017_1, mother of infant]</td>
</tr>
<tr>
<td></td>
<td>“So, she clears her tray. She either eats it or she throws it on the floor. So, if something is just always going on the floor, then we just don’t do it anymore ‘cause I don’t want to waste food” [ID 089_2, mother of toddler]</td>
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<td></td>
<td>“Usually if she spits it out and won’t eat more than a few bites of it we’ll give it a few weeks and then try again” [ID 010_1, mother of infant]</td>
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<td></td>
<td>“I might wait a few weeks, even or even just a couple of days I’ll try it again” [ID 056_2, mother of toddler]</td>
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<td></td>
<td>“I’ll cook it in a different way and offer it again. A good example for me would be avocado. She had hated avocado up until she had guacamole. Now she loves it” [ID 065_1, mother of infant]</td>
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<td></td>
<td>“I just think it depends on age...and when he kind of gets through this phase of whatever he’s going through at the moment and is like back to being like a little more open about things or is older” [ID 044_1, mother of infant]</td>
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<tr>
<td></td>
<td>“Even my other kid whose now [in a] super picky toddler phase...I’m just like waiting for him to come around and try to play the long game” [ID 063_2, mother of toddler]</td>
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<tr>
<td></td>
<td>“If he had it in something else and likes that food then I can get him to go back and try it or if we’re at a friend’s house and he tried something random or tried something off of my plate or if I just wanted him to like a certain food, I think I would keep trying” [ID 037_2, mother of toddler]</td>
</tr>
<tr>
<td></td>
<td>“At this point it doesn’t really bother me as much because I feel like he’s just starting in and I think you just have to keep trying. You know within reason obviously, not force feed it, but try it, if it isn’t good maybe mix it with something else and other times still not, wait a month so and try it again” [ID 046_1, mother of infant]</td>
</tr>
</tbody>
</table>

Caregivers Vary in Their Persistence and Decisions to Keep Offering Foods

Caregivers differed considerably in their intentions to persist in offering foods that their children were currently rejecting. The number of exposures reported by caregivers differed; although a few suggested that a single rejection would cause them to change course (one and done), most reported they offered foods in the range of 2–5 times. Some mentioned being willing to offer the rejected food around 10 times, even when children showed repeated rejection.

Some firmly stated they would “never give up,” and the intention to persist did not differ by the age of their child or their perceptions of how negative children’s behaviors were during eating, but rather seemed to relate to an intrinsic belief that this was simply the right approach. Those who intended to persist presented themselves as somewhat impervious to the experience of rejection, stating:

I don’t ever stop offering him a food if it’s in our rotation. If he doesn’t eat it, he doesn’t eat it. But, I will never not put it on his plate or [not] offer it to him. [ID 018_2, caregiver of toddler]

On the other end of the persistence spectrum, some caregivers were more prone to give up easily. This group reported more negative child eating behaviors and being influenced by whether their child liked food in their decision to reoffer.

Responsiveness to child cues (subtheme). The most common factors influencing caregivers’ intentions to persist were their perceptions of how much their child likes (or dislikes) the food, the amount of that food that their child is willing to consume, and their child’s interest in the food. In other words, if children eat it and like it, most caregivers reported persisting.

If the child did not respond well to the food or refused it, caregivers’ intentions varied by their beliefs and expectations (ie, as noted above, some spoke of “never giving up,” and some reported moving on to another food or another version of the same food). Persistence, both on a given day and for a specific eating occasion, was also spoken about in the context of how much children had eaten during that day (or meal); if children had not eaten much, or in the caregiver’s view, had not eaten “enough,” caregivers were more likely to move on to another food to ensure adequate food intake.

Caregivers reported looking for specific child behaviors when determining whether to continue offering food during a specific meal. These included the child asking or signing for more, the child’s level of excitement for and interest in the food,
and nonverbal cues such as opening their mouth, pointing, or lunging toward the food. Not surprisingly, one important behavior was the child’s consumption of food: the ultimate goal of child feeding is getting the child to eat.

“If he will eat the whole tub then I will definitely buy it again” [ID 075_1, caregiver of infant].

Caregivers decided to quit offering the food during a meal on the basis of negative child behaviors. The negative child behaviors caregivers spoke of included when their child threw the food, cried or fussed, gagged in response to the food, expelled the food, and turned their head away from the spoon to refuse the food. In all, there were many more negative behaviors described by caregivers than the positive ones detailed above.

Adult-centered beliefs, needs, and decisions (subtheme). Some caregivers reported that repeated exposure naturally occurs when the family eats together and the child “eats what we eat.” This perspective appeared to be a parent’s expectation that the entire family eats the same foods that parents eat, particularly when these foods are staples and “everyone eats this food.” These beliefs were more often mentioned by caregivers of toddlers and in reference to these expectations being developmentally appropriate for children this age.

“We feed them what we eat, so as long as we’re still going to eat it, it’s going to be offered” [ID 098_2, caregiver of toddler].

Some caregivers spoke of the division of responsibility in child feeding or elements of the concept. For example, they endorsed continuing to offer foods but avoided forcing children to consume any particular food. However, very few caregivers spoke specifically of the importance of modeling eating foods as a strategy to facilitate acceptance by their young child.

“I let her decide. I give her what we are eating and then she can eat whatever she wants, or not eat it” [ID 036_2, mother of toddler].

Some barriers, such as a perceived allergy or food sensitivity (ie, not anaphylaxis), prohibited caregivers from continuing to offer food to their child, although these were not clearly linked to whether the child rejected the taste of the food. Additional barriers such as waste, whether of time, money, or food, were factors that influenced whether they would buy more of a rejected food. For a few caregivers, more often caregivers of toddlers, the frustrations of child feeding—the wasted time, occasions when children do not eat to caregivers’ expectations when children eat the food on one day but refuse it the next—make the prospect of continuing to offer a rejected food overwhelming. For these, the mercurial and unpredictable nature of toddlers was related to the decision to quit offering the food.

It’s frustrating if I’ve gone out of my way to make her something or give her something and she doesn’t want it. Her favorite foods change often. So, it’s also hard for me to kind of keep food in the house that I know she’s going to eat. So, it’s frustrating from a shopping standpoint and also from—you know you take the time and energy to get it ready and then she doesn’t want it. [ID 089_2, caregiver of toddler].

Caregivers spoke of the overall experience of feeding the food to the child. When children become frustrated or unhappy, when feedings take too long to accomplish or are too big of a hassle, caregivers report that it is no longer worth the effort to continue to offer that food. At this point, they move on.

“If it’s such a huge hassle and he seems to clearly hate it, I probably will wait” [ID 015_2, caregiver of a toddler].

That said, other caregivers reported more neutral feelings (“it’s normal”) and they either keep trying or move on without feelings of negativity. These caregivers viewed their children’s food refusals as a stage of children’s development. They stated that they have goals for their children’s eating and that feeding their child, even when the experience is negative, is part of their caregiving role.

I think we all have foods that we don’t like. So, I think that’s natural. I don’t think it’s realistic to think that she’s gonna like every food. Yeah, so I don’t think that’s a big deal. We have a 2-year-old that’s the pickiest eater on the planet. So that wouldn’t bother us. So, I think for the baby that’s normal. [ID 044_1, caregiver of infant].

Caregivers who stated that they would cease offering food on the basis of child rejection also spoke about food attributes—taste, food texture, or the form or preparation of the food—as influencing their children’s rejection and indicated that these were reasons to either quit offering the food or try to find another version of that food to present.

“That it has to do with texture and it’s not all taste” [ID 042_1, caregiver of an infant].

Finally, despite the majority of caregivers characterizing their children as “good eaters,” caregivers very seldom described the child feeding experience as pleasurable or positive.

Child Food Acceptance Will Change With Time, Circumstances, and Development If You Keep Trying

When caregivers were asked what might compel them to reoffer a previously rejected food, they often referred to “taking a break.” The suggested interval caregivers might wait between a child’s rejection and their reoffering of food varied from days to weeks to months.

“After we’ve offered it a few times over the course of a week, and we’ll take a break and wait to offer it again” [ID 095_2, caregiver of toddler].

Caregivers often mentioned the perceived healthfulness of food as a reason to return and offer it at a later time, perhaps prepared in a different way or a different location (eg, at a friend’s or relative’s house) or offered by a different caregiver.

“I would continue to offer it if I knew it was like healthy for him regardless of like if he reacts” [ID 047_1, caregiver of infant].

Some suggested they might substitute a food they perceived to be similar (whether by taste or by nutrition)
instead of returning to the same food. A few stated they might try different feeding methods, like sandwiching the disliked food in between bites of a preferred food or using games or distractions to get the child to take a bite.

“Or in a variety, like in a different way. [Caregiver talking to child] Hide it in there a little bit” [ID 060_1, caregiver of infant].

Many caregivers linked their intention to reoffer the food sometime in the future to their beliefs that children’s preferences and tastes will change with age and development and that, like them, their children would become less picky with age. Most often, caregivers endorsed the belief that children need to learn to eat what parents eat, with the implication that this was their family mealtime rule.

DISCUSSION
Caregivers’ knowledge and beliefs about the effects of repeated exposure and their intentions to persist in offering rejected foods were prominent in influencing their decisions to continue offering food to their child. Caregivers’ knowledge was sourced in part from messages delivered by health care providers and also from their research regarding child feeding. However, what caregivers know and what they do in terms of persisting in offering a rejected food varies considerably. This disconnect for some between knowledge and behavior may be a reflection of caregivers’ reactions to child displeasure during food rejection. Reoffering a rejected food in the face of child resistance and dislike was reported to be difficult for many caregivers, in part because their priority was on ensuring that children ate “enough” more so than attempting to increase novel or disliked food acceptance.

Whether and How Caregivers Use Repeated Exposure Strategies
Most caregivers were familiar with the concept of repeated exposure, though many did not know details or articulate explicit strategies of how to implement it at home successfully. More often, they spoke of changes in preparation, pairing or hiding the novel food with other, better-liked foods, rather than the classic research strategy of repeatedly offering the food prepared in the same way. Holley et al. previously reported that caregivers of preschoolers (mean age, 34.9 ± 12.23 months) also endorsed “hiding vegetables within other foods” or presenting them in various forms; however, caregivers in their study were unsure of whether these strategies were effective. Although it is encouraging that the message of repetition and persistence is being received by caregivers, for many caregivers in this study, knowledge did not necessarily translate into what researchers consider to be effective use.

Participants’ intentions to continue offering rejected foods varied considerably—a spectrum from those who firmly stated they would “never give up” all the way to those few who stated that if their child did not like the food or protested, they would quickly move on. For those who intended to persist, their stated convictions were linked to beliefs about repeated exposure as being an effective strategy to promote their child’s food acceptance. Chawner et al. reported recently that some parents might believe that repeated offering and experiential learning are, in theory, effective practices. However, those who did not intend to use these practices did not believe these practices would work for their child. Spyrellis et al. conducted focus groups with a similar group (n = 37) of White, educated participants in the United Kingdom and inquired about feeding practices used during weaning (child age ranged from 3 to 14 months). Participants in that study endorsed beliefs about repeated exposure, particularly as a preventive measure for future food fussiness and to reduce the stress of mealtimes. Their participants also stated that infancy was regarded as a time when caregivers have more control over what children eat and is a good time for introduction to variety to ward off future picky eating. These views align with reports from caregivers of infants (aged 6–12 months) in our study who related that they experienced few issues with offering children new foods and that they had not “yet” experienced food fussiness.

Some caregivers in our study voiced firmly held views about family mealtime rules and expected that children should learn to “eat what we [the family] eats.” Presumably, families with expectations that children should eat what the rest of the family eats would provide opportunities for repeated exposure to family foods through family mealtimes, though the timeframe over which the exposure would occur is undetermined. Furthermore, focusing on the emotional tone at family mealtimes and how expectations are conveyed for introducing new or previously rejected foods (ie, positive affect, modeling, appropriate reward, and low pressure and instrumental feeding) has also been reported to be important in helping to establish better child food acceptance and more positive mealtime experiences.

Some caregivers expressed a belief that repeated exposure might work over some time and related this belief to their eating history; that is, they remembered having been picky eaters as children, or they had another child who had been picky at some point. When caregivers expressed that their child was “like me” (or another caregiver or child in the family), they expressed some faith that their child would become less picky over time and reject fewer foods because that had been their personal history. These maternal beliefs about possible similarities between themselves and their child are supported by studies that suggest that picky eating and neophobia are highly heritable traits. Other caregivers noted that certain child traits (eg, the child is shy or fearful by nature) required a longer interval of exposure to new foods, a different schedule (eg, with breaks), or a different food preparation method (eg, sensitivity to texture) for exposure to be effective. In observational research, infants and toddlers who exhibited lower approach behaviors (eg, wariness and hesitation in response to novelty) also showed lower acceptance of novel foods. Furthermore, Holley
et al. reported similar findings in their qualitative research with mothers of preschoolers, reporting that child temperament (e.g., stubbornness) was related to mothers’ reluctance to persist in offering children vegetables. Thus, children’s traits may challenge caregiver persistence in offering rejected foods and could ultimately lead to lower food acceptance and dietary variety.

How Caregivers Decide

Even though caregivers knew of the strategy of repeated exposure and reported offering food many times, their decisions to continue offering food were sometimes dependent on whether they thought their child liked (or disliked) the food. When caregivers observed positive child behaviors (e.g., verbally asking or signing for more, consuming a whole portion, pointing/lunging toward the food), they reported they would persist in offering that food. As noted in another study, when caregivers observed negative child behaviors (e.g., crying/fussing, expelling the food, throwing the food), they reported ceasing to offer the food, at least for some time. Caregivers in this study often spoke of “taking a break” from the rejected food, either at a specific meal or over days, weeks, or an unspecified length of time. They believed that returning at some later time would be more likely to facilitate acceptance than persisting in offering in the short term. These findings highlight an inconsistency between the knowledge of the utility of repeated exposure and the effective implementation of this strategy with infants and toddlers, especially when a child’s response was highly negative. It has been previously concluded that managing expectations for the process and rapidity of success of repeated exposure strategies is important to communicate to parents who may have little confidence in its effectiveness for their child.

Nicklaus et al. make the point that facial reactions, such as grimacing, are often interpreted as dislike but do not always result in the child’s refusal to eat the food. Although other researchers have conveyed that some mothers endorse that facial responses do not always result in rejection or unwillingness to continue consuming the food that evokes such a response, caregivers in this study more often suggested that this was a sign of rejection and could lead to “taking a break.” Nicklaus et al. suggest that parents should be encouraged to continue offering new foods to promote sensory learning, even when children’s reactions seem negative.

The goal of improving food acceptance was at odds with some caregivers’ priority of making sure their children eat enough to sustain healthy growth and development and reducing hassles at mealtimes. In this situation, caregivers prioritized children’s short-term needs (i.e., eating enough and liking the food) over longer-term goals, such as learning to like and consume a variety of healthy foods. Similar findings have been reported previously, especially when cost and waste were important factors in determining child-feeding strategies. Furthermore, caregivers in this study explained that when a child is too upset during a feeding, the hassle should be avoided because they believed little or no progress would be made toward food acceptance. The value of keeping the child happy by offering foods that are liked over those that are rejected has been reported cross-culturally and appears to cross socioeconomic strata.

Finally, and consistent with prior research, even caregivers who stated they tend to persist in offering new or disliked foods also said they did not do so if the child developed a perceived food sensitivity (not necessarily an allergy).

Caregivers often spoke of developmental aspects of children’s eating that illuminated the difficulty of feeding young children. A preponderance of caregivers’ remarks reflected the negative aspects of children’s eating behavior and the challenge of feeding them. It seemed, on the basis of caregiver responses, that feeding children of this age—particularly toddlers—day after day and multiple times per day is not necessarily viewed as a rewarding part of parenting. Feeding was described as a parenting role that demands a level of grit and is more effective when explicit expectations and goals are set to help children accept a variety of foods and when there is a long-term goal of achieving healthy dietary intake. As others have noted, this can be a long and, many times, unrewarding process.

Despite the demanding aspects of child feeding, most caregivers in our sample were relatively sanguine about the experience of their child rejecting foods. They viewed this experience as a typical, if sometimes less than pleasant, part of child development and as part of the job of parenthood. Similar views have been reported by caregivers of preschoolers who reported that they came to accept their children’s refusal of vegetables by focusing on foods their child would eat rather than persisting in offering rejected foods. A minority of caregivers in this study reported child rejection to be highly frustrating and very difficult, particularly when the rejected food was something that caregivers liked and ate or when the food was considered to be a family staple. Similar reports of maternal frustration and angst are found in the literature, and variations in how caregivers respond may reflect socioeconomic (related to waste and cost) or cultural differences among groups participating in different studies.

Caregivers in the Good Tastes Study stated a common belief that children’s tastes (often referred to as taste buds) change as they grow older. Participants implied that physiological and/or morphological changes in taste would be responsible for future changes in children’s liking of foods. Although frequently stated in this sample, there is, to date, only limited evidence to suggest that physiological changes occur during childhood and that tastes evolve across the first 24 months of life, especially for sweetness, saltiness, and umami. Whether these taste changes are accounted for by physiological and/or dietary exposures or cognitive development is not yet fully understood. Some literature proposes that it may not strictly be “taste” but rather the hedonic response to foods (which can be learned via experience) that changes.
sample of caregivers about offering new or disliked foods to infants and toddlers (aged 6–24 months), representing information from an age group during which the transition to complementary feeding and table foods is initiated, and that has been less focused on than older preschool children. Although the sample comprised a convenience sample of relatively educated, White caregivers with middle to high income, it can still provide valuable information regarding the challenges of early child feeding. However, great care should be taken not to overgeneralize the finding of this nondiverse sample.

Other caregivers who influence young children’s eating (fathers, grandparents, nannies, child care staff, etc) were not represented, and thus a complete picture of caregivers’ decisions regarding children’s dietary exposure is not represented here. Prior research has also identified food waste as a barrier to persistence in offering disliked foods to children, especially among families with low income. Although this barrier was mentioned by a small number of caregivers in our sample, it is likely a more pervasive issue among families with limited resources, which may affect caregivers’ decisional processes about offering and reoffering new or disliked foods.

Furthermore, scant research has focused on the influence of gender identity in feeding roles and practices, and the data from this study do not address this aspect of child feeding. Many individuals take part in shaping young children’s food acceptance patterns, and the questions addressed herein deserve to be addressed in much broader audiences. Another limitation is that this was a cross-sectional study with a single time point for data collection in a laboratory setting; information caregivers reported during the interview might not be consistent with their behaviors at home. In addition, transcripts were not shared with participants, and thus, caregivers may have had additional thoughts and clarifications about what they were trying to convey that were not included in this analysis and interpretation. Finally, we did not ask caregivers about their feeding styles or support for toddlers’ autonomy, but it is quite likely that these factors and the valence of how caregivers offer foods may impact children’s responses in the moment and over time.

**IMPLICATIONS FOR RESEARCH AND PRACTICE**

These findings provide insights into caregivers’ decisions regarding offering novel and disliked foods to their infants and toddlers across the complementary feeding period—a time of rapid child development and high demand for caregivers. Although caregivers in our sample knew the importance of repeated exposure, the translation of the theory into effective strategies that caregivers can easily and confidently practice was less often spoken of and highlights the opportunity to investigate more fully the nuances of repeatedly offering initially rejected foods. Efforts to create effective messages and strategies to support caregivers to continue to offer initially rejected foods, even to children who are fussy or averse to novelty, are needed to help overcome these challenging interactions.

Caregivers’ responses about how and whether they persist in using repeated exposure strategies highlight that important translational details are unknown, and more research to elucidate facilitators for positive food parenting strategies (eg, repeated exposure) could be helpful in improving interventions with caregivers of young children. For example, additional research into optimizing the interval between exposures and the effects of taking a break could provide a greater understanding of what counts as repeated exposure. Furthermore, given that family mealtimes have been associated with many positive child health outcomes, including the consumption of a healthy diet, promoting a message that infants and toddlers can eat what the family eats could lead to positive eating outcomes for young children.

Furthermore, a limitation of this study was the lack of data regarding the variability in caregiver feeding practices and styles. A complete understanding of how caregiver feeding practices related to children’s reactions to novel foods (eg, opportunities to learn to self-feed vs caregiver-led feeding) has the potential to inform best practices for offering new foods to children of this age. Additional factors, such as cultural influences on feeding decisions as well as education, income, food security, and access to healthful food, could greatly impact these findings, and future studies should carefully replicate these findings in more diverse samples.

Opportunities exist for health care providers and nutrition educators to reinforce messages about repeated exposure to novel and disliked foods with encouragement to caregivers to persist in the face of children’s initial rejection of these foods. Emphasis on continued offering and trying, more than the amounts of these foods that children consume, can support caregivers in following repeated exposure strategies.

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