Children judge others based on their food choices

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Abstract

Individuals and cultures share some commonalities in food preferences, yet cuisines also differ widely across social groups. Eating is a highly social phenomenon, however little is known about the judgments children make about other people’s food choices. Do children view conventional food choices as normative and consequently negatively evaluate people who make unconventional food choices? In five experiments, 5-year-old children were shown people who ate conventional and unconventional foods, including typical food items paired in unconventional ways. In Experiment 1, children preferred conventional foods and conventional food-eaters. Experiment 2 suggested a link between expectations of conventionality and native/foreign status: Children in the U.S. thought English speakers were relatively more likely to choose conventional foods than French speakers. Yet, children in Experiments 3 and 4 judged people who ate unconventional foods as negatively as they judged people who ate canonical disgust elicitors and nonfoods, even when considering people from a foreign culture. Children in Experiment 5 were more likely to assign conventional foods to cultural ingroup members than to cultural outgroup members; nonetheless they thought that no one was likely to eat the nonconventional items. These results demonstrate that children make normative judgments about other people’s food choices and negatively evaluate people across groups who deviate from conventional eating practices.

Keywords

Social cognition; food selection; social judgment; disgust

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Eating is a complex behavior. Preferences for sweet and salty flavors emerge early in development, are present across cultures, and are thought to have evolved to promote

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physical growth (Birch, 1990; Coldwell, Oswald, & Reed, 2009; Desor, Maller, & Turner, 1973; Mennella, Lukasewycz, Griffith, & Beauchamp, 2011; Ventura & Mennella, 2011). Humans also exhibit preferences for familiar flavors, including foods they were exposed to in utero or through their mother’s breast milk (Aldridge, Dovey, & Halford, 2009; Birch, 1990; Birch & Marlin, 1982; Hausner, Nicklaus, Issanchou, Mølgaard, & Møller, 2009; Mennella, Jagnow, & Beauchamp, 2001; Sullivan & Birch, 1990). Additionally, ingesting some items should be universally avoided. Some plants are toxic and would be extremely harmful or fatal if consumed by humans (e.g., Keeler & Tu, 1991), and infants avoid touching plants (Wertz & Wynn, 2014b). Together, this evidence highlights common mechanisms and patterns of human eating behavior across cultural groups.

Amidst these similarities in what humans eat, there is also notable cultural diversity. For instance, different religious groups have different rules for what should be eaten – some allow pork but prohibit beef (Doniger, 2017), whereas others allow beef but prohibit pork (Regenstein, Chaudry, & Regenstein, 2006). The historic availability of a food in an environment may also dictate whether it is incorporated into the local culture’s cuisine. Chili peppers are a staple in Mexican cuisine, as chili peppers originated in this geographic region. Though chili peppers are widely available around the world today, modern cultural cuisines continue to reflect this difference in geographic origins – on average, participants from a small Mexican village could tolerate higher levels of spice than a sample of American college students (Rozin & Schiller, 1980). In addition to cultural influences on food preferences, food selection and eating are inherently social experiences – people often eat with each other and eating together increases people’s perceptions of closeness and tendency to cooperate (Miller, Rozin, & Fiske, 1998; Rozin, 1999, 2005; Shutts, Kinzler, & DeJesus, 2013; Woolley & Fishbach, 2016).

Food choice is embedded in a social context, and research with young children suggests that the cognitive mechanisms supporting this mode of thinking are present early in development. Infants select foods after watching another person put that food in their mouth (as opposed to behind their ear), but they do not make similar choices after watching a person put an artifact in their mouth (Wertz & Wynn, 2014a). Infants also associate food selection with patterns of social affiliation and cultural groups (Liberman, Kinzler, & Woodward, 2014; Liberman, Woodward, Sullivan, & Kinzler, 2016). By preschool age, children consider contextual information, rather than just the flavor of a food itself, when selecting foods (DeJesus, Shutts, & Kinzler, 2015; Lumeng, Cardinal, Jankowski, Kaciroti, & Gelman, 2008; Roberto, Baik, Harris, & Brownell, 2010), and they are highly attentive of the food choices of their peers and ingroup members when choosing foods (Birch, 1980; Cruwys, Bevelander, & Hermans, 2015; DeJesus, Shutts, & Kinzler, 2018; Frazier, Gelman, Kaciroti, Russell, & Lumeng, 2012; Hendy & Raudenbush, 2000). If food choice is imbued with social meaning early in life, do children expect others to adhere to particular food choices? Although past research suggests that food cognition and social reasoning are linked early in life, open questions remain concerning how children judge other people’s food choices and whether children negatively evaluate other people who make unusual food choices. The present research examines this question.
One possibility is that children may expect food preferences to be idiosyncratic at the individual level, and therefore they may not hold negative opinions about people who make different food choices than they would make themselves. By 18 months of age, infants understand that other people’s food preferences differ from their own. Though a child may like Goldfish crackers and dislike broccoli, they could learn that another person might have the opposite preference. When faced with this scenario, children were more likely to give an experimenter the experimenter’s preferred food choice (e.g., broccoli) instead of their own preferred food (Repacholi & Gopnik, 1997). Relatedly, 6- to 10-year-old vegetarian children who abstained from eating meat for moral reasons only expected other morally committed vegetarians to adhere to vegetarianism, but they did not judge non-vegetarians (who had not made a moral commitment) for eating meat (Hussar & Harris, 2010). Thus, children’s judgments were based on whether people lived up to their moral commitments, not on their food choices directly. These studies suggest that children view some aspects of food selection as a matter of individual choice and may not negatively evaluate people who make unconventional food choices.

Alternatively, children may view some food choices as wrong, rather than as a matter of individual choice. Even among items that are considered to be edible, social conventions often dictate which combinations of foods are considered acceptable to eat. Regional preferences and traditions vary widely and elicit strong opinions – which toppings belong on a pizza or a hot dog, the best methods and ingredients for barbecue, whether tacos should include corn or flour tortillas. Given children’s tendency to expect others to follow rules and behave in ways that are consistent with their normative obligations in other domains (Diesendruck & Markson, 2011; Paulus & Moore, 2014; Schmidt, Rakoczy, & Tomasello, 2012; Schmidt & Tomasello, 2012), we might expect children to demonstrate similar patterns of social judgment in the context of food selection.

The present research tackles this question by testing children’s thinking about other people’s conventional and unconventional food choices. In five experiments, five-year-old children were presented with information about what other people like to eat. We selected this age based on evidence that children attend to what peers and cultural ingroup members are eating by this age (DeJesus, Shutts, et al., 2018; Frazier et al., 2012; Shutts, Banaji, & Spelke, 2010). In addition, children’s recognition and enforcement of cultural norms has been documented in the preschool years (Diesendruck & Markson, 2011; Schmidt, Rakoczy, & Tomasello, 2011), and slightly older children (7-year-olds) demonstrate a tendency to moralize novel behaviors, even those that are not obviously harmful (Rottman & Kelemen, 2012; Rottman, Young, & Kelemen, 2017). In Experiment 1, children either evaluated conventional and unconventional food choices or the people who made those choices. In four subsequent experiments, we examined children’s thinking about the relationship between food and culture and their judgments about wider range of food choices, including judgments of native and foreign people who ate conventional foods, unconventional foods, nonfoods, and disgust elicitors. One possibility is that children may not expect outgroup members to follow the same rules as ingroup members (Schmidt et al., 2012), suggesting that food-based judgments should be restricted to cultural ingroup members. Alternatively, children may extend judgments about food selection broadly, and negatively judge people (regardless of their cultural background) who make unconventional food choices.
Experiment 1: Conventional vs. Unconventional Foods

In Experiment 1, we tested five-year-old children’s evaluations about other people’s conventional and unconventional food preferences. Children viewed photographs of people who reportedly ate different foods, including conventional fruits and fruit parts that are not typically eaten (e.g., apples, bananas; apple cores, banana peels) and conventional and unconventional food combinations (e.g., hot dog with mustard, milk with chocolate syrup; hot dog with chocolate syrup, milk with mustard). Children were either asked to evaluate the food choices of the people presented or to evaluate the people themselves.

Method

Participants.—Participants in Experiment 1 included 32 five-year-old children (16 male, 16 female; M_\text{age} = 5.48 \text{ years}, \text{range} = 5.06 – 6.00 \text{ years}). In terms of race/ethnicity, 15 children were White, 10 were African-American, and 7 were multiracial or other according to parental report. Two additional children were excluded due to exposure to another language (n = 1) or opting not to complete the study (n = 1).

Participants in all studies were tested in the Midwestern United States and recruited from a volunteer database to participate in the laboratory or from local schools. Participants in all experiments were monolingual English speakers with limited exposure to other languages according to parental report.

Materials & Procedure.—Children were shown pictures of people and foods on a laptop computer. For 12 trials, children saw one face and one food on a white background (see Figure 1, top) and were told the person loves to eat that food; for example, “This is Sarah. Sarah really likes to eat apples. It’s her favorite thing to eat. She always eats apples.” After hearing each person’s food preference, in a between-subjects design, one group of children (n = 16) was asked about their perceptions of the foods:

1. Is that okay, or not really?
2. Do you want to be friends with [him/her], or not really?
3. Do most people like to eat X, or not really?
4. Do you want to try X, or not really?
5. Is X yummy or yucky? Really [yummy/yucky] or a little [yummy/yucky]?

A different group of children (n = 16) was asked about the people who ate those foods:

1. Do you like [name of person], or not really?
2. Do you want to be friends with [name], or not really?
3. Is [name] from around here or from far away?

The face stimuli set included 12 White faces (6 male, 6 female). The food stimuli set included photos of conventional and unconventional foods. Conventional foods included 4 familiar fruits (apples, bananas, orange slices, watermelon slices) and 8 typical food combinations (e.g., sandwiches with peanut butter and jelly, fries with ketchup).
Unconventional foods included 4 fruit parts (apple cores, banana peels, orange peels, watermelon rinds), which can be eaten but typically are not in their raw form, and 8 atypical food combinations (e.g., sandwiches with peanut butter and ketchup, fries with jelly). The unconventional food combinations included the same ingredients as the conventional combinations, but rearranged such that the combination would not be typical of American diets.

For this and all subsequent experiments, parents provided written consent and completed demographic questionnaires and children provided verbal assent. All procedures were approved by the university’s institutional review board (“Food and social reasoning,” H10073). Children participated in these experiments between 2013 and 2017. All children participated in only one experiment in the present research.

**Design, Scoring, & Analysis.**—Stimuli were counterbalanced across participants such that one group of children saw an ingredient presented conventionally (e.g., milk with chocolate syrup, hot dog with mustard) and another group of children saw those same ingredients presented unconventionally (e.g., milk with mustard, hot dog with chocolate syrup). Each child saw 2 of 4 fruits, 4 of 8 conventional combinations, 2 of 4 fruit parts, and 4 of 8 unconventional combinations for a total of 12 trials per participant. In addition to counterbalancing ingredient status (conventional vs. unconventional) across participants, the order in which conventional and unconventional foods were presented and the order in which male and female targets were presented were counterbalanced within and across participants. Children received only one question set. In this experiment, question sets were developed sequentially, therefore participants were not randomly assigned to question set. In subsequent experiments, children were randomly assigned to question sets (where relevant).

For each question, children’s responses were scored as a 1 if they responded positively (okay, yes, yummy, around here) and a 0 if they responded negatively (not really, no, yucky, far away). Scores are presented as the mean proportion of positive responses. Children’s scores were averaged across question and item within each food category to create a conventional and an unconventional score for each participant (see Table 1 for children’s responses by item). Scores were analyzed using a repeated-measures ANOVA with food category (conventional, unconventional) entered as a within-subjects factor and question set (food, person) entered as a between-subjects factor. Raw data files are available on the Open Science Framework: [https://osf.io/5yedk/?view_only=79cab35be4704a999ba7c586e463f456](https://osf.io/5yedk/?view_only=79cab35be4704a999ba7c586e463f456)

**Adult Judgments.**—As a manipulation check, a group of parents of similar-age children assessed the foods (n = 33). Adults read a written list of the conventional and unconventional foods and assessed whether “most people like to eat” those foods on a scale of 1 (no, most people do not like to eat this) to 7 (yes, most people do like to eat this) and whether they would try those foods on a scale of 1 (definitely no) to 7 (definitely yes). Adults confirmed our intuitions that people like to eat the conventional foods more than the unconventional foods (M = 6.06 vs. 1.59, t(32) = 18.78, p < 0.001, d = 3.27), and are more willing to try the conventional foods than the unconventional foods (M = 6.61 vs. 2.16, t(32) = 20.69, p < 0.001, d = 3.60).
Results

Children rated conventional foods and the people who eat them ($M = .67, SE = 0.04$) more positively than unconventional foods ($M = .42, SE = 0.04$), $F(1, 30) = 29.02, p < .001, \eta^2_p = 0.49$ (see Figure 2, top). We also observed an effect of question set, $F(1, 30) = 7.91, p = .009, \eta^2_p = 0.84$. Children provided more positive ratings for person questions ($M = .64, SE = 0.05$) than for food questions ($M = .45, SE = 0.05$). There was also a significant Food x Question interaction, $F(1, 30) = 5.41, p = .027, \eta^2_p = 0.15$. To examine this interaction, we computed the difference between children’s average conventional and unconventional scores and performed an independent samples $t$-test to compare children who answered food and person questions. This difference was larger for food questions ($M = .35, SE = 0.07$) than for person questions ($M = .14, SE = 0.06$), $t(30) = 2.33, p = .027, d = 0.85$.

Discussion

Five-year-old children evaluated conventional foods and the people who eat them more positively than unconventional foods/eaters. This preference was especially robust for children’s assessments of the foods themselves, compared to their social evaluations of the people who eat those foods. These findings provide evidence that, by age 5, children have strong opinions about what should and should not be eaten, even when presented with foods that are equally familiar but arranged into conventional and unconventional combinations. This study provides an initial examination of children’s reasoning about what is acceptable and unacceptible to eat, but many important open questions remain. First, a key question of interest is whether children link food selection with cultural group membership. Experiment 2 examines this question directly. Second, unconventional food choices might seem noteworthy when compared to familiar and well-liked foods and combinations, but may seem more acceptable when compared with more extreme choices (e.g., disgust elicitors or nonfoods). Experiments 3–5 examine these possibilities by asking children to evaluate a range of food choices and consider the food choices of people from different cultural backgrounds.

Experiment 2: Associations Between Culture and Food Selection

Experiment 2 examines whether children expect ingroup members to be more likely to eat conventional foods and outgroup members to be more likely to eat unconventional foods. This pattern would suggest that thinking about the conventionality of food choice is somewhat constrained by group membership. Alternatively, children might over-extend their thinking about conventional food choices to all people, without considering cultural background. In an initial test of this question, children in Experiment 2 were presented with people who spoke in English (participants’ native language) or French (an unfamiliar foreign language) and assigned a conventional food and an unconventional food to each person. We hypothesized that children would be more likely to assign the conventional food to the English speaker and the unconventional food to the French speaker, compared to the opposite pattern.
Method

Participants.—Participants in Experiment 2 included 32 five-year-old children (16 male, 16 female; \( M_{\text{age}} = 5.45 \) years, range = 5.03 – 6.13 years). In terms of race/ethnicity, 15 were White, 11 were African-American, 3 were multiracial, 2 were Asian, and 1 was Hispanic according to parental report. One additional participant was excluded due to experimenter error.

Materials & Procedure.—Children were introduced to 8 pairs of gender-matched faces presented on a white background on a laptop computer. The face stimuli set included 16 White faces (8 male, 8 female). The experimenter introduced the faces by saying, “Here are two people,” then pointed to each face in turn and said, “This person sounds like this” before playing a voice clip. For each trial, one person spoke English and the other person spoke French. The voice stimuli set included 16 voice clips of child-friendly speech (e.g., “April is a month when it rains a lot”) recorded from 4 bilingual speakers of English and French (2 male, 2 female).

After introducing each pair, the experimenter showed children two food cards simultaneously, one depicting a conventional food combination (e.g., fries with ketchup) and one depicting an unconventional food combination (e.g., pancakes with salsa). Children were asked to place the cards in front of the picture of the person who likes that food (one food per person).

The food stimuli set included the conventional and unconventional foods from Experiment 1, printed in color on 10.5 × 7 cm cards and laminated. Foods with the same components were never paired together (e.g., fries with ketchup and fries with jelly were in different trials because they both include fries).

Design, Scoring, & Analysis.—The lateral position and gender of the English and French speakers and the order in which conventional and unconventional foods were presented was counterbalanced across participants. Trials were scored as 1 if children matched the conventional food to the English speaker and the unconventional food to the French speaker, and as 0 if children matched the conventional food to the French speaker and the unconventional food to the English speaker. Children’s scores were converted to a proportion (ranging from 0 to 1.0), with scores above .50 representing more English=conventional/French=unconventional choices and scores below .50 representing more French=conventional/English=unconventional choices. Proportions were compared to chance (.50) using a one-sample t-test.

Results & Discussion

Children were more likely to match conventional foods with English speakers and unconventional foods with French speakers (\( M = .58, SE = 0.03 \)) than would be expected by chance, \( t(31) = 2.30, p = .029, d = 0.41 \).

This pattern reveals an association between cultural group (here, denoted by spoken language) and food choice. Rather than randomly assigning foods, children predicted that people who share their native language would eat conventional food items. This study
suggests that children view food and culture as related, in line with children’s predictions and judgments about foreign-language speakers in other domains, including social evaluations, moral rules, nationality or geographic background, and the types of clothing they wear and dwellings they live in (DeJesus, Hwang, Dautel, & Kinzler, 2018; Hirschfeld & Gelman, 1997; Kinzler & DeJesus, 2013; Liberman, Woodward, & Kinzler, 2017; Rhodes & Chalik, 2013; Souza, Byers-Heinlein, & Poulin-Dubois, 2013; Weatherhead, White, & Friedman, 2016).

Open questions remain as to the scope and robustness of this effect. Eating an unconventional food might seem problematic when compared to a conventional choice, but unconventional food choices might not seem as noteworthy compared to behaviors that are widely considered to be disgusting or atypical. For instance, eating a hot dog with chocolate syrup might seem unusual when others are eating a hot dog with mustard, but might not be viewed as negatively compared to eating something not typically considered to be food in Western diets, such as an insect (see Van Huis et al., 2013). In contrast, if children view any aberration from the norm negatively, then children may judge people who eat unconventional foods as harshly as people who engage in even more atypical behaviors. In Experiments 3–5, we expanded the types of foods presented to children, including canonical disgust elicitors, such as insects or bodily products (Rozin, Haidt, & McCauley, 1999), and other items that are not typically considered to be food, and also explored whether children negatively evaluated both cultural ingroup and outgroup members who were shown to eat non-conventional foods.

**Experiment 3: Unconventional Foods vs. Disgust Elicitors**

Children in Experiment 3 were shown a series of people and the foods they like to eat, including conventional foods, unconventional foods, nonfoods, and disgust elicitors. As in Experiment 1, children were either asked questions about the foods or about the people who ate those foods.

**Method**

**Participants.**—Participants in Experiment 3 included 32 five-year-old children (16 male, 16 female; $M_{age} = 5.55$ years, range = 5.06 – 6.09 years). In terms of race/ethnicity, 12 were White, 11 were African-American, 5 were biracial or other, 3 were Hispanic, and 1 was Asian according to parental report. One additional participant was excluded from analysis for opting not to complete the study.

**Materials & Procedure.**—Children were shown pictures of people and foods on a laptop computer. For 16 trials, children saw one face and one food on a white background (using the same 12 faces as in Experiment 1 and four additional faces; see Figure 1, bottom). As in Experiment 1, children were told that each person loves to eat the presented food. After hearing each person’s food preference, children were either asked questions about the foods ($n = 16$) or the people who ate those foods ($n = 16$). The test questions were similar to those used in Experiment 1, except that the “friends” question was omitted from the food question set to more clearly delineate questions about foods from questions about people. Children were randomly assigned to question set.
The face stimuli set included 16 White faces (8 male, 8 female). The food stimuli set included photos of conventional foods, unconventional foods, nonfoods, and disgust elicitors (see Table 2). Conventional and unconventional foods were selected from the stimuli sets in Experiments 1 and 2. Nonfoods included items that are not typically considered food (grass, leaves, newspaper, flowers), and disgust elicitors were selected based on previous research citing adult disgust reactions to the idea of eating certain animals (insects, worms), bodily products (hair) or foods that demonstrate signs of decay (fruit with mold; Rozin et al., 1999).

**Design, Scoring, & Analysis.**—The order in which food categories (conventional, unconventional, nonfood, disgust elicitor) were presented and the order in which male and female targets were presented were counterbalanced within and across participants. Children’s scores were averaged across question and item within each food category to create a score for each food type (conventional, unconventional, disgust, nonfood) for each participant. Scores were analyzed using a repeated-measures ANOVA with food type entered as a within-subjects factor and question set (food, person) entered as a between-subjects factor.

**Results**

Children’s assessments of foods and the people who eat them differed by food type, $F(3, 90) = 68.82, p < .001, \eta_p^2 = 0.70$. Pairwise comparison with a Bonferroni correction revealed that children evaluated conventional foods/eaters ($M = .72, SE = 0.04$) more positively than all other foods/eaters ($ps < .001$). Children did not differ in their evaluations of unconventional foods/eaters ($M = .24, SE = 0.04$), disgust elicitors ($M = .15, SE = 0.03$), and nonfoods ($M = .15, SE = 0.04$), $ps > .095$. We did not observe an overall difference in children’s responses by question set, $F(1, 30) = 2.12, p = .156, \eta_p^2 = 0.07$, but there was a significant Food x Question interaction, $F(3, 90) = 6.77, p < .001, \eta_p^2 = 0.18$. To examine this interaction, we conducted independent samples $t$-tests to compare children’s response to each food type (conventional, unconventional, disgust, nonfood) by question set (food vs. person). After correction for four comparisons, children’s responses to the food and person questions only differed for disgust elicitors (food: $M = .04, SE = 0.02$; person: $M = .25, SE = 0.05$), $t(30) = 3.64, p = .004$. All other comparisons were not significant after correction ($ps > .168$).

**Discussion**

Children’s evaluations of a wide range of foods reveal that conventional foods and the people who eat those foods were evaluated more positively than any alternative. These evaluations extended not just to the foods themselves, but also to the people who ate the foods. In addition, children’s ratings of unconventional foods (and the people who eat them) did not differ from their ratings of food choices that might be considered even more atypical, including disgust elicitors and nonfoods. Children evaluated anyone who did not eat conventional foods more negatively than people who ate what they considered to be more typical to eat.

These results provide further evidence that by age 5, children already have strong expectations about what should or should not be eaten. Given that children in Experiment 2
associated food choice with cultural group membership, Experiment 4 examines whether children’s evaluations of other people’s food choices would similarly depend on those people’s cultural group membership. Specifically, would children negatively judge cultural outgroup members who make unconventional food choices? In light of the finding that children hold different normative expectations for ingroup and outgroup members (Schmidt et al., 2012), children may not view the rules of food selection as applying to cultural outgroup members, regardless of how children evaluated those foods themselves. Alternatively, children may negatively judge the food choices of outgroup members, even if they expect food choice to vary based on cultural groups. Children may not fully appreciate the process of cultural transmission that gives rise to cultural diversity in food selection, and instead may view the food choices that are common in their own culture as objectively correct. In many contexts, people assume that current circumstances are stable and can be explained by inherent factors (e.g., it is objectively correct to drink orange juice for breakfast), even though these circumstances change over time and can have arbitrary origins (e.g., a marketing strategy developed by orange growers; Cimpian & Salomon, 2014; Sutherland & Cimpian, 2015; Tworek & Cimpian, 2016). To examine children’s social judgments of outgroup members’ food choices, children in Experiment 4 were told that all the people they would see were from a novel cultural group.

**Experiment 4: Judgments About a Foreign Culture**

Children in Experiment 4 were presented with the same procedure as in Experiment 3, but evaluated people they were told were from a fictitious country called “Cortania,” a faraway country where people speak an unfamiliar language (French). We created this fictitious country so that children would not have any previous experience with people or foods from that country. Children were either asked to evaluate the foods or the people who ate each food.

**Method**

**Participants.**—Participants in Experiment 4 included 32 five-year-old children (16 male, 16 female; M_{age} = 5.32 years, range = 5.04 – 5.98 years). In terms of race/ethnicity, 19 were White, 11 were African-American, 1 was Asian, and 1 was multiracial according to parental report. An additional five children participated but were excluded from analysis due to language exposure (n = 2), experimenter error (n = 2), or the child opting not to complete the study (n = 1).

**Materials & Procedure.**—Experiment 4 used the same procedure as Experiment 3 with an introduction added to the beginning of the experiment to characterize people as members of another culture. Children were told, “Everyone that we meet today is from a place called Cortania. Cortania is really far away from where we are now.” Children were shown a map of Cortania (an outline of Antarctica) and a Cortanian flag (a green and white flag with a crest; see Figure 3, top right). Children were told that people from Cortania speak a different language and the experimenter played four voice clips of “what people from Cortania sound like” (four audio clips of French; two female speakers, two male speakers; children either heard a female or a male French speaker first).
Children were then shown the same stimuli of people paired with conventional foods, unconventional foods, disgust elicitors, and nonfoods from Experiment 3. Each person was described as being from Cortania (e.g., “This is Sally from Cortania. Sally really likes to eat X”) and two test questions were adjusted to refer to Cortania (“Is that okay in Cortania, or not really?” and “Do most people in Cortania like X, or not really?”). Children were assigned to either answer questions about the foods (n = 16) or the people who ate those foods (n = 16).

**Design, Scoring, & Analysis.**—The design, scoring, and analysis was the same as Experiment 3, with the exception that the near/far question (“Is [name] from around here or from far away?”) was excluded from the analysis because children were explicitly told where people were from. Instead, this question was treated as a manipulation check. Children reported that people were from far away (M = .97, SE = 0.03), t(15) = 17.1, p < .001, d = 4.28.

**Results**

Children’s assessments of foods and the people who eat them differed by food type, F(3, 90) = 40.25, p < .001, \( \eta^2_p = 0.57 \). Pairwise comparison with a Bonferroni correction revealed that children evaluated conventional foods and conventional food eaters (M = .77, SE = 0.04) more positively than all other foods or people who eat those foods (ps < .001).

Children did not differ in their evaluations of unconventional foods/eaters (M = .35, SE = 0.06), disgust elicitors/eaters (M = .27, SE = 0.05), and nonfoods/eaters (M = .29, SE = 0.06), ps > .616. We observed no significant effect of question, F(1, 30) = 0.50, p = .483, \( \eta^2_p = 0.02 \), or Food x Question interaction, F(3, 90) = 2.09, p = .107, \( \eta^2_p = 0.07 \).

To compare children’s responses in this experiment to children in Experiments 3 (who made the same judgments without information about cultural outgroups), we performed a repeated-measures ANOVA with food type entered as a within-subjects factor and question set (food, person) and experiment (3, 4) entered as between-subjects factors. We observed significant effects of food, F(3, 180) = 104.51, p < .001, \( \eta^2_p = 0.64 \), and a Food x Question interaction, F(3, 180) = 7.48, p < .001, \( \eta^2_p = 0.11 \) (no significant effect of question, F(1, 60) = 1.72, p = .194, \( \eta^2_p = 0.03 \)). Children rated conventional foods/eaters (M=.74, SE=0.03) more positively than the alternatives, ps < .001, and rated unconventional foods (M = .30, SE = 0.03) more positively than disgust elicitors (M = .21, SE = 0.03), p = .032. To examine the interaction, we conducted independent samples t-tests comparing children’s response to each food type (conventional, unconventional, disgust, nonfood) by question set (food vs. person). No significant differences were observed after correcting for four comparisons.

We also observed a significant effect of experiment, F(1, 60) = 4.92, p = .030, \( \eta^2_p = 0.08 \). Children provided more positive ratings in Experiment 4 (M = .42, SE = 0.03) than Experiment 3 (M = .31, SE = 0.03). No significant interactions between experiment and any other factors were observed, ps > .50.
Discussion

Children in Experiment 4 evaluated conventional foods and the people who eat them more positively than all other items. Even though all people were described as cultural outgroup members and children confirmed that they lived far away, children viewed some choices (i.e., conventional foods) as inherently correct and more negatively judged people who made different food choices, regardless of their cultural background. As such, children’s evaluations of foods may play an important role in guiding their social judgments of others (see Hamlin, Mahajan, Liberman, & Wynn, 2013; Hamlin & Wynn, 2012, for related evidence in infants).

At first blush, these findings seem at odds with the results of Experiment 2, in which children assigned conventional foods to ingroup members and unconventional foods with outgroup members. How can these results be reconciled? One possibility is that children may not expect cultural outgroup members to know the food rules that they know, and consequently they might view outgroup members as more likely than ingroup members to make unconventional food choices (even if children themselves view those choices as wrong). An alternative possibility is that children view some food choices as objectively wrong and think that no humans would eat those foods, even if they do associate food choice with cultural group membership. To further examine these possibilities, children in Experiment 5 were asked to directly report who would be more likely to eat conventional foods, unconventional foods, disgust elicitors, and nonfoods: A cultural ingroup member (American, English-speaking) or a cultural outgroup member (Cortanian, French-speaking). One group of children was also given the option to say that no one would eat those foods. In this design, children could associate food choice with cultural group membership across conditions. Alternatively, given their robust negative judgments of nonconventional foods in previous experiments, children might expect that no one would eat those items.

Experiment 5: Assigning Foods to Native and Foreign Speakers

In Experiment 5, children were presented with one American, English-speaking person and one “Cortanian”, French-speaking person. One group of children was asked if the “American” or “Cortanian” person would be more likely to eat each food (conventional, unconventional, disgust elicitors, nonfoods). Another group of children was explicitly given the option to say that no one would eat those foods.

Method

Participants.—Participants in Experiment 5 included 32 five- and 6-year-old children (16 male, 16 female; $M_{\text{age}} = 5.45$ years, range = 5.03 – 6.06 years). In terms of race/ethnicity, 11 were White, 11 were African-American, 6 were multiracial, 2 were Hispanic, and 1 was Asian according to parental report. One parent did not report their child’s race or ethnicity. One additional child was excluded due to language exposure.

Materials & Procedure.—Children were shown two faces, gender-matched to the participant, on a white background on a laptop computer. The experimenter introduced each face one at a time by saying, “This person sounds like this,” and pointed to each face while
playing a voice clip. One person spoke English and the other person spoke French from the voices used in Experiments 2 and 4. The English speaker was introduced as being from America and living “right near here,” and children were shown a map of America and its flag. The French speaker was introduced as being from the fictitious country Cortania and was said to live, “really far away from here,” and children were shown a map of Cortania and its flag (see Figure 3).

After introducing children to the American and Cortanian people, the experimenter explained that the participant would be shown items on cards, one at a time. Each card depicted an item from the conventional, unconventional, disgust, and nonfood stimuli sets in Experiments 3 and 4. The cards were printed in color on 10.5 × 7 cm cards and laminated. One group of children \((n = 16)\) was then asked whether the American or Cortanian person ate the item on the card (e.g., “This is watermelon. Who eats this? This person [researcher points to left] or this person [researcher points to right]?”, referred to subsequently as “two-choice”). The faces and flags from the introduction remained onscreen during the entire session so that children could point to their selection. Another group of children \((n = 16)\) was asked whether the American, Cortanian, or nobody ate the item (e.g., “This is milk with mustard. Who eats this? This person [researcher points to left], this person [researcher points to center], or nobody [researcher points to right]?”, referred to as “three-choice”). In addition to the American and Cortanian faces and flags, children saw a picture of a plate setting with a null sign to represent “nobody” (see Figure 3, bottom right).

**Design, Scoring, & Analysis.**—The lateral position of the American, Cortanian, and nobody icons during the test trials and the order in which the American and Cortanian people were introduced were counterbalanced across participants. The order in which the cards were shown to participants was counterbalanced across participants in the same manner as Experiments 3 and 4.

To examine children’s categorizations within each choice option, we summed children’s categorizations of each food to the American person, to the Cortanian person, and (if applicable) to nobody (maximum = 64). We then performed a chi-square to test for an association between culture (American vs. Cortanian) and food type (conventional, unconventional, nonfood, and disgust) and binomial tests to directly compare selections for each food type. For the two-choice group, the binomial test compared the “American” selections to a probability of .50 for each food type. For the three-choice group, the binomials test compared the most selected response to a probability of .33 for each food type.

**Results**

**Two-Choice (Native vs. Foreign).**

When asked to assign foods to either a person described as American or Cortanian, we observed an association between culture and food type, \(X^2(3) = 49.4, p < .0001\) (see Table 3, top). Children distributed more conventional foods to ingroup members \(\text{sum}_{\text{American}} = 56\) than to outgroup members \(\text{sum}_{\text{Cortanian}} = 8\), \(p < .0001\) (binomial test, .50). Children did not differentiate between ingroup members and outgroup members when distributing
unconventional foods (sum\textsubscript{American} = 34, sum\textsubscript{Cortanian} = 30, \( p = .71 \)) or nonfoods (sum\textsubscript{American} = 27, sum\textsubscript{Cortanian} = 37, \( p = .26 \)), but did distribute more disgust elicitors to outgroup members than to ingroup members (sum\textsubscript{American} = 18, sum\textsubscript{Cortanian} = 46, \( p = .0006 \)).

Three-Choice (Native, Foreign, Nobody).

When asked to assign foods to a person described as American, a person described as Cortanian, or to nobody, we again observed an association between culture and food type, \( \chi^2(6) = 156.81, p < .0001 \) (see Table 3, bottom). For conventional foods, the most frequent response was “American” (sum\textsubscript{American} = 43, sum\textsubscript{Cortanian} = 16, sum\textsubscript{Nobody} = 5), more often than would be expected by chance, \( p < .0001 \). For all other foods, the most frequent response was “Nobody” (unconventional: sum\textsubscript{Nobody} = 50, sum\textsubscript{American} = 7, sum\textsubscript{Cortanian} = 7; disgust elicitors: sum\textsubscript{Nobody} = 59, sum\textsubscript{American} = 0, sum\textsubscript{Cortanian} = 5; nonfoods: sum\textsubscript{Nobody} = 58, sum\textsubscript{American} = 0, sum\textsubscript{Cortanian} = 6), binomial test (.33): \( ps < .001 \). Children in the 3-choice condition distributed the majority of items to nobody (sum\textsubscript{Nobody} = 172), rather than assigning them to either Americans or Cortanians (sum\textsubscript{American+Cortanian} = 84; binomial test (.50): \( p < .0001 \)).

Discussion

Experiment 5 reveals two key findings. First, children demonstrated some association between cultural groups and food selection when thinking about conventional foods. Children in both the two- and three-choice conditions were more likely to assign conventional foods to ingroup members than to outgroup members, and children in the two-choice condition were more likely to assign disgust elicitors to outgroup members. Second, when explicitly provided with the option to assign foods to nobody, children overwhelmingly selected this option for unconventional foods, nonfoods, and disgust elicitors. Children’s unwillingness to assign these options to anyone is consistent with their negative evaluations of those items and the people who eat them in prior experiments – children think that no one would or should eat these items. These experiments suggest that children hold strong beliefs about what should and should not be eaten and negatively judge anyone who eats what children classify as unacceptable to eat, regardless of that person’s cultural background.

Including both the two-choice and three-choice conditions in Experiment 5 provided a clearer picture of how children think about outgroup members’ food choices. When forced to choose who eats what, children only associated disgust elicitors more frequently with the outgroup, and distributed unconventional foods and nonfoods nearly equally across the ingroup and outgroup member. Yet, children typically claimed that nobody ate any of the nonconventional options in the three-choice condition. When considering these two conditions together, it appears that children do not believe anyone will eat any of these nonconventional foods, but they are especially reluctant to entertain the idea that a cultural ingroup member could eat a disgust elicitor. Including only one of these two conditions would not have revealed this nuanced pattern of results.
General Discussion

The present experiments provide evidence that children hold strong opinions about what should and should not be eaten and generalize these beliefs to their judgments of other people. Children evaluated people who made unconventional food choices more negatively than people who made conventional choices (Experiments 1, 3, and 4). They also evaluated people who ate unconventional foods just as negatively as they evaluated people who ate nonfoods or disgust elicitors (Experiments 3–4). Though children predicted that ingroup members would be more likely than outgroup members to eat conventional foods (Experiment 2, 5), children negatively evaluated outgroup members who ate non-conventional foods and reported that no one would eat those foods when explicitly provided with the option to do so (Experiment 5). Together, these studies suggest that children view eating unconventional food choices as fairly negative – even somewhat akin to eating disgust elicitors. Although preschool-aged children may accept when outgroup members behave non-normatively in other domains (e.g., when playing a game; Schmidt, Rakoczy, & Tomasello, 2012), children in the present research expected others to only eat what they deem acceptable, even members of cultural outgroups.

Future research could expand on this work by involving a more diverse array of foods, a more culturally diverse sample of participants, and a more nuanced measure to assess children’s judgments. First, children in this study were not shown completely unfamiliar foods. The “unconventional” items either included an unusual part of a familiar fruit (e.g., orange peel), or an unusual combination of familiar foods (e.g., fries with grape jelly). Even the disgust elicitors and nonfoods were likely familiar items, just not ones that children in the United States typically consider to be food. Thus, it is unknown how children would evaluate entirely unfamiliar food items, such as dishes from the cuisine of a faraway culture or fruits and vegetables they have never eaten before. Children could also negatively appraise unfamiliar foods and the people who eat them, as previous work demonstrates that children prefer familiar foods (Birch & Marlin, 1982; Rioux, Lafraire, & Picard, 2018). Examining children’s beliefs about a wider range of foods and eating practices is therefore an important direction for future investigation.

Second, this study focused on monolingual English-speaking children living in one community in the United States. Recruiting participants from diverse backgrounds and measuring more fine-grained aspects of children’s experiences would be a productive direction for future research. Examining children’s thinking about food across cultural groups, including religious groups with explicit rules about what should and should not be eaten, and bicultural children who may have direct experience with different food cultures, would be interesting projects for future research. Children may also vary in the extent to which they are exposed to a diverse set of foods or foods from different cultures. This variability could be examined at the level of parental beliefs (e.g., how important is it to expose children to different cultures), the extent to which children interact with people from different cultures, whether different cuisines are available in children’s neighborhoods, or children’s own pickiness. For instance, parents may be less willing to offer children an unfamiliar food if their child is a picky eater. All of these factors, at both the cultural and
individual level, could contribute to children’s willingness to eat different foods and their social judgments about other people.

Third, future studies should employ a broader range of measures to examine additional aspects of children’s reasoning about other people’s food choices. The measures in the present research asked children for a binary response or to associate a food with a specific person. This question style ensured that children understood the questions and could clearly respond but may gloss over subtler differences. Future research could employ continuous measures to develop a more nuanced picture of children’s food-related evaluations. For instance, children did not differentiate between unconventional foods, nonfoods, and disgust elicitors. Researchers employing a continuous scale might observe instances in which children evaluate unconventional foods (which still all involve food items) more positively than nonfoods and/or disgust elicitors, but less positively than conventional foods. Additionally, children were shown foods individually rather than as direct comparisons. Children may view unconventional foods as more acceptable when they are directly compared with disgust elicitors and children may be more willing to affiliate with an unconventional food eater over a disgust elicitor eater.

These findings raise interesting questions regarding how children learn the food rules of their culture and their broader understanding of cultural conventions. These results suggest that, once cultural rules are learned, children apply them widely and inflexibly (even to members of cultural outgroups). Research on children’s and adults’ thinking about inherence supports this idea – the instinct to assume that conventions are objectively correct and enduring features of our social world, rather than being arbitrary or emerging from idiosyncratic circumstances, is powerful and observed across development (e.g., Cimpian & Salomon, 2014; Sutherland & Cimpian, 2015; Tworek & Cimpian, 2016). For instance, French fries are often eaten with ketchup in the U.S. and children in these studies endorsed that practice (mean = 0.70, SE = 0.09), but rated eating fries with jelly less positively (mean = 0.48, SE = 0.08), even though ketchup and jelly are both somewhat sweet fruit-based sauces and both pairings could taste good. Nonetheless, by age 5 children already view one (ketchup) as the more appropriate choice. Generic language (i.e., language that communicates general truths, rather than specific instances) may be especially important to establish conventions and norms (Roberts, Ho, & Gelman, 2017; Weatherhead et al., 2016). Probing children’s explanations for why some foods are more correct choices than others and considering the impact and production of generic language would be productive directions for future research.

Another open question concerns the relationship between children’s judgments of other people’s food choices and children’s own food preferences. Though we cannot answer this question definitively in this design, the extent to which children like a particular food could be related to their evaluations of other people – the more they personally like a food, the better they might evaluate another person who eats that food. This pattern would reveal reciprocal relations between children’s own preferences and social interactions. For instance, children eat more food in social contexts compared to when eating alone (Salvy, Vartanian, Coelho, Jarrin, & Pliner, 2008), and they prefer foods that are popular with or have been modeled by peers and cultural ingroup members (Birch, 1980; DeJesus, Shutts, et al., 2018;
Frazier et al., 2012; Hendy & Raudenbush, 2000; Lumeng & Hillman, 2007; Salvy, Vartanian, Coelho, Jarrin, & Pliner, 2008). Children may similarly conform to the food choices of their peers or their community, in part to avoid others’ negative evaluations, and may negatively evaluate people who do not conform to their own preferences. In contrast, children’s third-person evaluations (the focus of the present research) may differ from their own food choices. In our study, children evaluated the unconventional foods negatively. Yet, in another study, a cohort of slightly younger children were willing to eat unusual combinations of two well-liked foods: More than 90% of 43- to 60-month-old children were willing to eat a hot dog with chocolate and a cookie with ketchup (Rozin, Hammer, Oster, Horowitz, & Marmora, 1986). Children’s evaluations of others could be more conservative than their willingness to try foods themselves. Understanding relations between children’s evaluations of their and other people’s preferences is an important area for future investigation.

Finally, these results suggest that children view unconventional food choices more negatively than conventional choices, but the extent to which children are truly making a moral judgment is an open question. Children could perceive someone’s food choices as “wrong” in the sense that the person is having a bad gustatory experience or is unaware of the food rules that children appear to know. Alternatively, children could perceive these choices as “wrong” in a more deeply moral sense, in a way that reflects bad moral character (e.g., someone who eats insects would be more likely to harm another person than someone who eats oranges). Some studies have suggested that, to evaluate a novel action as immoral, children need explicit information that the action is disgusting and unnatural (Rottman & Kelemen, 2012; Rottman et al., 2017). Given that children at this age have probably eaten a food they thought tasted bad, children may automatically make the leap from an eating behavior they view as disgusting to an immoral act. Nonetheless, children may view these actions as restricted to one domain (eating) or diagnostic of a lack of cultural knowledge, rather than a deeper reflection of one’s moral character. Further studies examining children’s moral reasoning in the food domain are needed to tease apart these possibilities.

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References


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Highlights

• 5-year-olds judged conventional eaters more positively than unconventional eaters.
• Unconventional foods were judged as negatively as disgust elicitors.
• Children judge ingroup and outgroup members negatively for unconventional choices.
• Children appreciate food choice as a behavior conveying social meaning.
Figure 1.
Example trials from Experiment 1 (conventional: milk with chocolate syrup, hot dog with mustard; unconventional: milk with mustard, hot dog with chocolate syrup), top, and Experiment 3 (conventional: watermelon; unconventional: hot dog with chocolate syrup; nonfood: grass; disgust: insect), bottom.
Figure 2. Children’s evaluations of others’ food choices and their social judgments in Experiments 1 (top), 3 (center), and 4 (bottom), by item type. Higher scores represent more yes/yummy/near responses (i.e., positive evaluations). Error bars indicate standard error.
Figure 3.
Example stimuli used to describe people as Cortanian (Experiments 4 and 5; top right) and American (Experiment 5; top left) and to display choice options in Experiment 5 (bottom).
Table 1
Composites of Children’s Evaluations of the Foods in Experiment 1 (averaged across questions)

<table>
<thead>
<tr>
<th>Item</th>
<th>Food Mean (SE)</th>
<th>Person Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apples</td>
<td>0.60 (0.10)</td>
<td>0.83 (0.21)</td>
</tr>
<tr>
<td>Bananas</td>
<td>0.48 (0.10)</td>
<td>0.88 (0.22)</td>
</tr>
<tr>
<td>Chips w/ salsa</td>
<td>0.35 (0.07)</td>
<td>0.71 (0.18)</td>
</tr>
<tr>
<td>Fries w/ ketchup</td>
<td>0.70 (0.09)</td>
<td>0.75 (0.19)</td>
</tr>
<tr>
<td>Hot dogs w/ mustard</td>
<td>0.73 (0.07)</td>
<td>0.71 (0.18)</td>
</tr>
<tr>
<td>Mashed potatoes w/ gravy</td>
<td>0.38 (0.09)</td>
<td>0.50 (0.13)</td>
</tr>
<tr>
<td>Milk w/ chocolate syrup</td>
<td>0.63 (0.09)</td>
<td>0.79 (0.20)</td>
</tr>
<tr>
<td>Orange slices</td>
<td>0.85 (0.04)</td>
<td>0.75 (0.19)</td>
</tr>
<tr>
<td>Pancakes w/syrup</td>
<td>0.83 (0.05)</td>
<td>0.88 (0.22)</td>
</tr>
<tr>
<td>Sandwiches w/ peanut butter &amp; jelly</td>
<td>0.70 (0.08)</td>
<td>0.54 (0.14)</td>
</tr>
<tr>
<td>Watermelon slices</td>
<td>0.85 (0.04)</td>
<td>0.71 (0.18)</td>
</tr>
<tr>
<td>Yogurt w/ cereal</td>
<td>0.65 (0.09)</td>
<td>0.50 (0.13)</td>
</tr>
<tr>
<td><strong>Unconventional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple cores</td>
<td>0.10 (0.05)</td>
<td>0.58 (0.15)</td>
</tr>
<tr>
<td>Banana peels</td>
<td>0.15 (0.09)</td>
<td>0.50 (0.13)</td>
</tr>
<tr>
<td>Chips w/ syrup</td>
<td>0.25 (0.09)</td>
<td>0.54 (0.14)</td>
</tr>
<tr>
<td>Fries w/ jelly</td>
<td>0.48 (0.08)</td>
<td>0.63 (0.16)</td>
</tr>
<tr>
<td>Hot dogs w/ chocolate syrup</td>
<td>0.28 (0.09)</td>
<td>0.63 (0.16)</td>
</tr>
<tr>
<td>Mashed potatoes w/ cereal</td>
<td>0.40 (0.10)</td>
<td>0.46 (0.12)</td>
</tr>
<tr>
<td>Milk w/ mustard</td>
<td>0.00 (0.00)</td>
<td>0.58 (0.15)</td>
</tr>
<tr>
<td>Orange peels</td>
<td>0.13 (0.07)</td>
<td>0.42 (0.11)</td>
</tr>
<tr>
<td>Pancakes w/ salsa</td>
<td>0.25 (0.07)</td>
<td>0.67 (0.17)</td>
</tr>
<tr>
<td>Sandwiches w/ peanut butter &amp; ketchup</td>
<td>0.40 (0.07)</td>
<td>0.58 (0.15)</td>
</tr>
<tr>
<td>Watermelon rinds</td>
<td>0.45 (0.10)</td>
<td>0.71 (0.18)</td>
</tr>
<tr>
<td>Yogurt with gravy</td>
<td>0.38 (0.06)</td>
<td>0.58 (0.15)</td>
</tr>
</tbody>
</table>

Note. Means reflect how positively participants rated each food/person (possible range: 0 – 1.00).
## Table 2
Composites of Children’s Evaluations of Items in Experiment 3 and 4 (averaged across question)

<table>
<thead>
<tr>
<th>Item</th>
<th>Exp. 3: Food Mean (SE)</th>
<th>Exp. 3: Person Mean (SE)</th>
<th>Exp. 4: Food Mean (SE)</th>
<th>Exp. 4: Person Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apples</td>
<td>0.89 (0.04)</td>
<td>0.63 (0.10)</td>
<td>0.89 (0.18)</td>
<td>0.66 (0.10)</td>
</tr>
<tr>
<td>PB &amp; J</td>
<td>0.80 (0.09)</td>
<td>0.73 (0.10)</td>
<td>0.80 (0.31)</td>
<td>0.88 (0.09)</td>
</tr>
<tr>
<td>Watermelon</td>
<td>0.92 (0.04)</td>
<td>0.65 (0.09)</td>
<td>0.91 (0.15)</td>
<td>0.75 (0.09)</td>
</tr>
<tr>
<td>Yogurt w/ cereal</td>
<td>0.61 (0.09)</td>
<td>0.50 (0.10)</td>
<td>0.69 (0.35)</td>
<td>0.63 (0.12)</td>
</tr>
<tr>
<td><strong>Unconventional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banana peels</td>
<td>0.22 (0.09)</td>
<td>0.21 (0.08)</td>
<td>0.16 (0.31)</td>
<td>0.28 (0.11)</td>
</tr>
<tr>
<td>Hot dogs w/ chocolate syrup</td>
<td>0.30 (0.09)</td>
<td>0.38 (0.10)</td>
<td>0.55 (0.40)</td>
<td>0.56 (0.12)</td>
</tr>
<tr>
<td>Milk w/ mustard</td>
<td>0.03 (0.02)</td>
<td>0.25 (0.08)</td>
<td>0.28 (0.34)</td>
<td>0.28 (0.11)</td>
</tr>
<tr>
<td>Orange peels</td>
<td>0.25 (0.10)</td>
<td>0.31 (0.08)</td>
<td>0.27 (0.39)</td>
<td>0.41 (0.11)</td>
</tr>
<tr>
<td><strong>Disgust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hair</td>
<td>0.05 (0.03)</td>
<td>0.19 (0.06)</td>
<td>0.14 (0.34)</td>
<td>0.34 (0.11)</td>
</tr>
<tr>
<td>Insects</td>
<td>0.02 (0.02)</td>
<td>0.21 (0.07)</td>
<td>0.14 (0.27)</td>
<td>0.28 (0.10)</td>
</tr>
<tr>
<td>Strawberries w/ mold</td>
<td>0.08 (0.05)</td>
<td>0.31 (0.09)</td>
<td>0.39 (0.43)</td>
<td>0.34 (0.10)</td>
</tr>
<tr>
<td>Worms</td>
<td>0.03 (0.03)</td>
<td>0.29 (0.10)</td>
<td>0.20 (0.32)</td>
<td>0.28 (0.11)</td>
</tr>
<tr>
<td><strong>Nonfood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flowers</td>
<td>0.08 (0.04)</td>
<td>0.29 (0.09)</td>
<td>0.20 (0.29)</td>
<td>0.41 (0.12)</td>
</tr>
<tr>
<td>Grass</td>
<td>0.11 (0.05)</td>
<td>0.23 (0.08)</td>
<td>0.20 (0.31)</td>
<td>0.31 (0.10)</td>
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<tr>
<td>Leaf</td>
<td>0.09 (0.05)</td>
<td>0.25 (0.09)</td>
<td>0.33 (0.37)</td>
<td>0.47 (0.12)</td>
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<tr>
<td>Newspaper</td>
<td>0.05 (0.03)</td>
<td>0.13 (0.05)</td>
<td>0.08 (0.25)</td>
<td>0.28 (0.11)</td>
</tr>
</tbody>
</table>

*Note.* Means reflect how positively participants rated each food/person (possible range: 0 – 1.00).
### Table 3

Children’s Distribution of Items in Experiment 5.

<table>
<thead>
<tr>
<th>Experiment</th>
<th>Selection</th>
<th>Conventional</th>
<th>Unconventional</th>
<th>Disgust</th>
<th>Nonfood</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Two-choice</strong></td>
<td>American</td>
<td>56</td>
<td>34</td>
<td>18</td>
<td>27</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>Cortanian</td>
<td>8</td>
<td>30</td>
<td>46</td>
<td>37</td>
<td>121</td>
</tr>
<tr>
<td><strong>Three-choice</strong></td>
<td>American</td>
<td>43</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Cortanian</td>
<td>16</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Nobody</td>
<td>5</td>
<td>50</td>
<td>59</td>
<td>58</td>
<td>172</td>
</tr>
</tbody>
</table>