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Previous research has indicated that school lunchboxes play an integral role in children's food socialization, and children negatively judge those who bring nonnormative food to school. To our knowledge, no study has experimentally examined children's evaluations of different ethnic lunchbox foods. Using a virtual video-chat method, this study examined n = 81 children between 5-12 years of age and a comparison adult dataset of n=151 participants who completed our survey. We assessed 1) participants' understanding that people from different cultures stereotypically eat different foods, indexed through a face-to-food matching task, 2) examined their evaluations of foods from different cultures in terms of their messiness, taste, smell, and appropriateness to bring to school and 3) explored how neighborhood diversity would influence their performance on the tasks. Older children and adults were more likely to make stereotype-matches on the face-to-food matching task. For adults, having a higher proportion of racial outgroup members in their neighborhoods made these matches more likely. Within-subjects ordinal regressions revealed that participants rated all lunchboxes positively, though children rated Mexican, Chinese, and Indian lunchboxes less positively than the American lunchbox while adults rated the Chinese and Mexican lunchboxes as more positive. There were interactions between food and evaluation type, and neighborhood diversity did not predict participants' food ratings. The implications of our findings as they relate to food choices and social judgments are discussed.

WHAT'S IN YOUR *DABBA*? CHILDREN'S EVALUATIONS OF ETHNIC LUNCHBOX FOODS

by

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APPROVAL PAGE

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CHAPTER I: INTRODUCTION

In the short film *800 Lunches*, young Akshay, a newcomer Indian immigrant to New Zealand opens his lunchbox at school, and the smell of freshly spiced *biryani* wafts through the air (Someday Stories, 2019). He looks around, quickly realizing his tricolor chicken rice is not the same as everyone else's sandwiches and fruit. A teacher skeptically looks into his lunchbox and comments, “A sandwich would have been easier,” and his White classmate questions, “hey, are you a curry muncher?” Akshay looks confused and responds, “No, I’m Akshay” and then proceeds to throw his *biryani* in the trash. Each morning for the next 700 days, his mother lovingly packs his lunchbox with Indian foods that he either promptly throws in the trash or eats in isolation. Children with foreign-born parents bring some of their diversity to classroom settings, especially in terms of the food they pack in their lunchboxes. Indeed, according to the United States Census Bureau, 13% of the population is foreign born, with 1 in 4 children having at least one foreign-born parent (2010), indicating the ethnic diversity in American school settings. What reactions do ethnically diverse lunchboxes draw from children like Akshay and his peers? How do they evaluate the contents of the lunchbox in terms of the foods’ popularity, messiness, taste, smell and appropriateness to bring to school? The present study explores school-age children’s understanding that different people eat different kinds of foods and their evaluations of ethnic lunchbox foods.

Children’s Understanding of Food Preferences

Stemming from something as primal as our need for sustenance and sense of taste, food has been the foundation upon which entire communities are created, histories are inscribed, and cultures are passed down. Yet, from global colonialism to current-day schools across America, food has been wielded to demarcate ingroups and outgroups. This trajectory of cultural food socialization begins in infancy and carries into adulthood, and children’s understanding of food preferences is influenced by notions of conventionality that can drive ingroup-outgroup preferences.

FACTORS THAT INFLUENCE CHILD FOOD PREFERENCES

Some factors that influence children's development of food preferences are exposure to the food, social modeling, and awareness of food brands. Mere exposure to an initially unfamiliar food can help children develop a preference for that food as seen across familiarization trials in two-year-old toddlers (Birch & Marlin, 1982). Additionally, parent–led daily exposure to a vegetable can increase children's acceptance of that vegetable, as evidenced through an intervention carried out by parents of 2-6-year-old children (Wardle et al., 2003).

Social modeling of food influences food intake (see Cruwys et al., 2015 for review). Children rely on peer evaluations of food to try new foods and shape their own food preferences. When older peers model eating the nonpreferred food of a target preschool-aged child, the target child gradually shows a change in their preference and chooses the initially nonpreferred food, even when their highly preferred food is simultaneously available (Birch, 1980). When teachers enthusiastically model eating new foods, children are open to new food acceptance (Hendy & Raudenbush, 2000). However, in the presence of competing peer models, enthusiastic teacher modeling is no longer effective in promoting new food acceptance, as children follow their peers' preferences (Hendy & Raudenbush, 2000). Moreover, children are prone to consume a food that is described as popular with other children than unpopular with other children, and eat more of a food that is verbally described as popular with children compared to adults (DeJesus et al., 2018). Furthermore, children prefer and consume more of an unhealthy snack when it is described as being liked by the popular versus an unpopular peer (König et al., 2014).

Food brands are another factor that impact children's food preferences. Preschool children significantly report a higher preference for foods that have popular cartoon characters on the packaging compared to the same foods that are packaged without the characters (Roberto et al., 2010), and for branded fast-foods such as McDonald's compared to unbranded packaged foods (Robinson et al., 2007). In terms of school lunchboxes, children display an understanding that bringing popular branded food to school is cool, and that those who bring supermarket value branded snacks in their lunchbox were poor such that children who did bring nonbranded food reported being embarrassed by it (Ludvigsen & Scott, 2009).

In this way, children's exposure to different foods, their reliance on their peers' food choices and evaluations, and their awareness of food brands can influence their food preferences. Relatedly, research suggests that children behave differently in public versus private spheres, at least in the domain of resource allocation. They are strategically prosocial wherein they give out more stickers only when the recipient is privy to the donation options (Leimgruber et al., 2012); they steal less and give more when they know they are being watched by a peer (Engelmann et al., 2012). These differences highlight an understanding of social desirability (i.e., children behave more prosocially in public than private), but a different set of mechanisms may direct the relation between the public-private dimension and food choice or intake. In the realm of food, adult participants eat more when they have a picture of themselves or mirror in front of them, signaling that visual cues of someone being present during meal time increases consumption (Nakata & Kawai, 2017). Additionally, preschool children have been found to consume 30% more snacks when they are in a group of nine versus a group of three (Lumeng & Hillman, 2007), indicating that the relation of public and more socially desirable behavior plays out differently for people's food intake. While these findings could indicate that children's food preferences and consumption might vary as a function of who is around which could influence their evaluations of packed lunches at school, this dimension of food preferences is beyond the scope of this study.

Associations between food and identity

How did Akshay's peers ascertain that his food was unconventional and label him a "curry muncher?" School-age children demonstrate some understanding of the conventional/unconventional framework: at five years of age, children rate conventional foods (such as milk and chocolate syrup) and people who eat them more positively than unconventional foods (such as milk and mustard) and those who eat them (DeJesus et al., 2019). This conventional/unconventional framework also shapes children's perceptions of people from different ethnicities. When introduced to a person who spoke English (participants' native language) versus one who spoke French (a foreign language to this group), 5-year-olds were more likely to match the English speaker with the conventional food option and the French

speaker with the unconventional food option (DeJesus et al., 2019) suggesting that children expect outgroup members to make unconventional choices. In another experiment, the authors created a fictitious country called Cortania and introduced children to people from there. From the options of conventional (e.g., watermelon slices), unconventional (e.g., milk with mustard), disgust elicitors (e.g., insects), and nonfoods (e.g., grass), children were asked to point to which person (American or fictitious Cortanian) would be more likely to eat those foods. Consistent with the results above, children more frequently matched conventional foods and those who ate them as more positive than the other groups. They were also more likely to match disgust elicitors to outgroup persons, though when given the option of "nobody," children used this option more frequently for unconventional, nonfood and disgust elicitors irrespective of culture, indicating they have some understanding of what should be eaten at all.

Such ingroup-outgroup categorizations of food preferences can be seen as early as in infancy. A series of studies by Liberman et al. (2016) found evidence for an early emerging system of food choice in 14-month-old infants, illustrating that they have an understanding of social relations and food preferences of individuals from different groups. One-year-olds can generalize food preferences from one person to another: infants look longer at the actor who had a negative reaction to the same food that a first actor had shown a positive emotion towards (Liberman et al., 2016). Additionally, infants from monolingual English backgrounds were assigned to either the monolingual English, monolingual Spanish, or bilingual English-Spanish condition where two bilingual actors spoke either English, Spanish, or in both languages respectively. Here, infants looked longer at the second actor who disagreed with the first actor's food preferences in the monolingual English-English and Spanish-Spanish condition, but did not look longer at the actor who disagreed in the English-Spanish condition, indicating that infants expected those who speak the same language to have similar food preferences (Liberman et al., 2016).

This reasoning about the link between food and identity appears to continue in young adulthood too. When Asian American undergraduates felt their American identity was threatened by a White experimenter, they rated more prototypical White American foods as their favorite foods, and selected foods that were more prototypically American with higher calories when ordering

from a fictitious restaurant site (Guendelman et al., 2011). This signals that when threatened, people from minority groups can alter their food choices to those that are more conventional in order to feel part of the ingroup, with potentially negative consequences for their health (i.e., intaking more calories). Drawing from these findings on food and social identity, we are interested in examining how both, children like Akshay and Akshay's peers, perceive conventional and unconventional lunchbox foods.

Perceptions and Considerations of Lunchboxes

As seen in Askhay's story, the school lunchbox is the intersection of home and school. His mother packs the flavors of India in his lunchbox for him to consume among his peers at school. The contents of the lunchbox signal parental love and care through the desire to pack nutritional and culture specific food (Metcalfe et al., 2008). It also forms a medium through which children can create friendships or be distanced (Metcalfe et al., 2008). In terms of evaluating the contents of lunchboxes, researchers have drawn comparisons between school and packed lunches. Research done in the U.K. has shown that school lunches are more nutrient-balanced compared to packed lunches and offer better average nutrition than packed lunches (Stevens et al., 2013). Packed lunches contain almost double the amount of sugar (Rees et al., 2008) and are less likely to have fruit, vegetable or dairy (Johnston et al., 2012). Most of the existing research has been conducted in the U.K. and Australia; there are fewer comparative studies in the U.S. In one study, photographs of packed lunches of elementary school children in Massachusetts indicate that the foods more likely to be provided were 59% sandwiches, 42% snack foods, and 34% fruit (Hubbard et al., 2014). However, to my knowledge, there is no empirical research on the contents of ethnically diverse packed lunches, or lunchboxes that contain foods from different cultures apart from conventional sandwiches and packaged snacks.

Some studies have qualitatively shed light on children's perceptions of packed lunches. Ludvigsen and Scott (2009) conducted qualitative group interviews with 174 children aged 3-4, 9-10, and 14-15 years about their lunch time meals at school. Children across all ages rated taste as the most important indicator of what they chose to eat. When shown a picture of a healthy

lunch, they stated that healthy foods are for adults, while children would not *choose* to eat those foods and prefer sugary foods instead. Children also reported that they had switched from school lunch to packed lunch and vice versa to be able to eat the same things as their friends, reinstating a culture of conformity. White-bread sandwiches and crisps (potato chips) were the established conventional foods across the schools studied, with first and second-hand reports of Chinese and Indian children who brought chicken or curry being bullied (Ludvigsen & Scott, 2009). Children were also reported being able to discern branded compared to non-branded food items brought to school, and negatively evaluated those children who bought "cheap" packaged snacks (Ludvigsen & Scott, 2009) as mentioned earlier. Additionally, audio recordings and observations of classroom lunchtimes in Denmark reveal that students comment on the content of ethnic minority children's lunchboxes, stating that they were "not allowed to bring white bread" to school, but should bring rye bread instead which is considered superior (Karrebæk, 2012). Furthermore, observational and focus-group interviews with pupils in New Zealand have indicated that children from ethnic minorities do not bring their cultural foods to school because their peers would "laugh at them", and such foods require the use of utensils (unlike a sandwich) which would "get in the way" (Vasquez, 2013). Such perceptions of foods can lead to marginalization of ethnic minority students in the classroom.

Apart from these qualitative accounts of children's perspectives of lunchboxes in the classroom, another common method to assess lunchroom experiences is through retrospective interviews with adults. Indeed, retrospective reports of Asian American undergraduates indicate that they were significantly more likely than their White American counterparts to have had an embarrassing experience due to their food-related behaviors in school (for instance, Asian Americans eating rice and oxen soup), while White Americans left that question blank (Guendelman et al., 2011). Moreover, Asian Americans were more likely to complain to their parents about the non-American meals they took to school and felt uncomfortable during school lunchtime meals while their White American counterparts had American meals (Guendelman et al., 2011). Similarly, qualitative reports of Mexicano adults illustrate that the school lunchroom was a space where children's private foods became public knowledge, such that it was a place of public embarrassment for them (Salazar, 2007). They struggled with adjusting to American

school lunches and were cognizant of the sociocultural divide between them and their White American peers, especially in terms of the "cool" foods their affluent peers would bring. They remembered eating very little at school and rushing home to eat "real food" (Salazar, 2007).

In addition to children's perceptions of packed lunches and lunchtime experiences, parents play an integral role in this process too as they pack and prepare their child's lunchboxes. Focus groups on parents in Australia reveal that parents indicated they want help in planning inexpensive but nutritious lunchbox foods for their children (Bathgate & Begley, 2011). Especially for parents from lower economic backgrounds, factors such as cost, convenience, child food preferences, and food safety are barriers to them packing healthier food options in their child's lunchboxes (Bathgate & Begley, 2011). Parents of 4^{th}-6^{th} graders who reported higher nutritional knowledge packed more fruits across the school week as observed via a digital imaging procedure, and parental higher financial stress was related to their children having almost no vegetables in their lunchboxes (Sutter et al., 2019). However, when parents and their children negotiated the contents of the lunchboxes, such that children were involved in purchasing the foods, they were more likely to consume those foods (Metcalfe et al., 2008) and their lunchboxes contained more fruits and vegetables (Sutter et al., 2019). These findings highlight that school lunchboxes are an important medium for children's food socialization as the contents not only signify the intersection of home and school, but also come under scrutiny in the social setting of lunchrooms.

Development of Ethnic Preferences and Stereotypes

How were Akshay's White peers able to discern that he looked different from them? Research indicates that infants as young as three months are able to distinguish ingroup faces and show a visual preference to own-race faces compared to other-race faces as seen in White, African-American, and Chinese infants (Kelly et al., 2007). However, this effect is only seen for infants in homogeneous own-race environments compared to those infants who have cross-race exposure (Bar-Haim et al., 2006). By late childhood, children have traditional stereotypes, such as Black people being better at music or girls being better at reading (Rowley et al., 2007). Older

children, in contrast, use their "personal beliefs" to make such ratings—they show more positive associations with Black-associated stimuli compared to typical stereotype knowledge of associating Black with negative adjectives (Augoustinos & Rosewarne, 2001).

These prejudices appear to develop over time. Drawing from the social identity theory, Nesdale (2004) proposes a model for ethnic prejudice in children. Around 3 years of age, children develop ethnic awareness, and a sense of self-identification, or realization that they are part of a racial group, especially for those children in multi-racial societies. This transitions into holding ethnic preferences, which comes about through socialization and, by the age of 7, solidifies to ethnic prejudices (Nesdale, 2004). These prejudices can then guide biases and discriminatory behavior in school settings. For instance, students from ethnic minorities report being targets of discriminatory behavior, as evidenced by newcomer immigrant children in Canada who reported lower social competence in response to perceived discrimination by their peers and teachers (Oxman-Martinez et al., 2012). Although such studies assess perceived social discrimination through language, accent, and appearance, they rarely analyze it through the context of food. Additionally, such understanding of biases and associations translates to children's concept of cultural stereotypes as well. Israeli children as young as 3 years show an understanding of what it means for someone to be an Arab, their outgroup, with older children associating indicators of language and aggressive behaviors with Arabs (Bar-Tal, 1996). A competing theory, the multicultural theory, posits that strong and secure in-group identity leads to positive attitudes towards other groups (Negy et al., 2003). This implies that children who have stronger ethnic identities may have more positive attitudes towards all groups compared to those who are ethnocentric.

Children use physical demographic markers as indicators to guide their ethnic preferences. Four-to-six-year-old children can identify stereotypical demographic markers on facial stimuli—White American and Asian children racially categorize Asian, Black and White faces by discerning their skin color and pigmentation as seen through matching tasks of target and sample stimuli (Balas et al., 2015). Moreover, by looking at pictures of White, Black and Hispanic faces, White children chose the most number of same-ethnic pictures for friendship, status and personal

identification, while Black and Hispanic children were more likely to choose other-ethnic choices for friendship and status thought they were able to accurately match their own ethnic group in the pictures (Newman et al., 1983). Are children able to match facial stimuli to different foods?

Another contextual factor that influences children's behaviors is their neighborhood diversity. One measure of neighborhood diversity is the proportion of members in the children's neighborhood who are not of the same race or language background as the child which can influence children's mere exposure to people of different racial or ethnic backgrounds. Recent studies that use U.S Census data as a measure of neighborhood diversity have found that these contextual influences of participants' lived environments influence infants and children's responses on tasks with outgroup or culturally unfamiliar stimuli. For instance, monolingual English speaking infants who lived in neighborhoods with higher linguistic diversity were more likely to imitate the actions of a foreign actor (Howard et al., 2014), and White infants who resided in neighborhoods with a higher proportion of racial outgroup members exhibited greater top-down attentional and neural mirroring responses to outgroup stimuli (Hwang et al., 2020). Neighborhood diversity also predicted the responses of 4-to 7-year-old children who were more likely to evaluate labeled foreign foods as more acceptable if they had higher neighborhood trust and outgroup population in their community (Hwang et al., 2021). In this way, racially diverse environments can influence children's responses and acceptance of outgroup stimuli. This study seeks to amalgamate these aspects of children's ability to discern racially different facial stimuli and the cultural diversity at their community level to explore whether children understand cultural stereotypes of food.

The Present Study

As highlighted by prior literature, lunchboxes can be indicators of social demarcation in terms of children's social class, and ingroup-outgroup food preferences. The studies above have used anecdotal and qualitative methods to highlight such preferences, but, we aimed at experimentally investigating children's evaluations of different ethnic lunchbox foods. The goal of the present

studies was threefold. In Study 1, we systematically assessed whether children expect people from different cultures stereotypically eat different foods and captured children's evaluations of these foods. In Study 2, we present data from a comparison adult study. Finally, in Study 3, we explored whether neighborhood cultural diversity (measured using U.S. Census data) is associated with participants' responses.

CHAPTER II: CHILD SAMPLE

The study first explored whether children have pre-existing stereotypes that people from other cultures typically eat different foods and, if so, what age this understanding comes online, indexed through a face-to-food matching task. We had two developmental predictions of how children would fare on the face-to-food matching task: either older children would be more likely to consistently match the face of the child to the ethnic food shown compared to younger children, as older children show a more detailed understanding of traditional stereotypes (Rowley et al., 2007), or children's performance in this task could be unrelated to age since even five-year-old children demonstrate an understanding of food conventionality (DeJesus et al., 2019). Next, we examined children's evaluations towards these foods on multiple dimensions and expected that children who rated a particular food positively on one dimension would rate it positively across all the dimensions measured, i.e., if children rated the food positively on taste, they would also rate it higher on smell. Finally, we hypothesized that children who take foods from different cultures to school would have more positive food evaluations.

Participants

Children between the ages of 5-12 years were recruited for this study based on previous findings with children of this age (Karrebæk, 2012; Ludvigsen & Scott, 2009) and to ensure participants have experience eating lunch at school. A G-Power Analysis for a medium effect size of $f^2 = 0.15$ (based on the effect size in DeJesus et al., 2019 that found medium effects for food type and face matching), $\alpha = 0.05$, Power = 0.8 using multiple-regression analysis with 4 predictors yielded a sample size of 85 children. The procedures of this study have received IRB approval.

Our current child sample consists of 81 children (40 5-to 8-year-olds, 41 9-to 12-year-olds, 44 (54%) female). 7 parents did not provide a date of birth for their children so their exact age could not be calculated; we confirmed age in years when children gave assent, so for those 7 children we estimated their age to be in the middle of the range (e.g., for a 6-year-old, we entered 6.5

years). Parents identified the majority of our sample as 72 (89%) Not Hispanic or Latino with 46 (57%) Caucasian or White (see *Appendix E, Table 4*). Parental demographics indicate that 46 (57%) parents had graduate degrees, and 26 (32%) reported combined annual household income to be more than $120,000.

The study was conducted via video-chat. Our *apriori* exclusionary criteria were:

1) they cannot see the researcher's screen or experienced Internet issues (n = 1),

2) they ask to stop the study or walk away from the screen without intention of returning to the study (n = 0),

3) they observe their sibling participate before them, (n = 0),

4) we do not receive the parent online consent form (n = 1),

5) the parent interferes with the study, (n=1), or

6) parents indicated that there are some children who do not eat at school (n=5).

In terms of parent interference, attentional prompts such as, "Look at the screen, she's asking you a question!" were not considered interference; parent comments related to the study content, such as "you always take sandwiches to school," were considered to be interference. Parental interference was noted at the end of the study. We decided that if the parent interfered for less than 20% of the study questions (5/24 questions), we would exclude the child's responses for those questions (and retain the rest of that participants' data) which we had to do for 1 child. If there was more than 20% interference, then we would exclude the child's data. For the final criterion (parents reported that their child did not eat at school, and we clarified during the session that their children did not eat at school even pre-pandemic), we present analyses with and without those participants to retain as many participants as possible.

Materials and Procedure

We created our own stimuli for this study, which was been tested with a pilot group of adults (*See Appendix D*). After we piloted, it was brought to our attention that the American lunchbox containing a sandwich, goldfish crackers and a tangerine was the only one without a utensil. We photoshopped mac and cheese on the tangerine and included a spoon in the image to ensure all the lunchboxes are uniform in terms of having at least one food that requires a utensil.

FACE-TO-FOOD MATCHING

Children first completed a face-to-food matching task to assess whether children expect people from different cultures stereotypically eat different foods. The child faces for this study were chosen from the CAFE face set which is a validated measure for children to identify facial emotional expressions as seen through congruence in adult and child ratings (LoBue & Thrasher, 2015; LoBue et al., 2018). The ten faces (five for each gender) are happy faces from the following races and ethnicities: African-American, White, South Asian, East Asian and Latinx. It must be noted that the South Asian boy face was taken from an independent set of face stimuli since there were no South Asian male faces in the CAFE face set. The gender of the faces the children saw was matched to the participant gender. Previous research has indicated that children prefer food and objects of children who are the same gender as them (Frazier et al., 2012; Shutts et al., 2010).

The four food varieties in the lunchbox are American (white bread sandwich, goldfish crackers, and macaroni and cheese), Indian (rice, *roti* or Indian bread, and *paneer* or cottage cheese), Chinese (garlic chicken with noodles and rice) and Mexican (beans, rice, corn salsa, and a taco) (*See Appendix A,*). The foods were intentionally chosen to be more Americanized versions of the ethnic foods, and we acknowledge that they might not be representative of authentic cultural foods. For the purposes of this study, we wanted to ensure children had some familiarity with the foods. The food order was randomized by Qualtrics across participants.

For each trial, children were shown an array of faces of children from the different races and ethnicities and a lunchbox, and then asked to choose the child most likely to bring that food to school. For example: “Look at these 5 girls and the lunchbox below. Who do you think is more likely to bring this food to school? Can you tell me the number of the picture for the girl who will bring this food to school?” Face pictures were numbered so that children could verbally state their answer (1 = African-American, 2 = East Asian, 3 = South Asian, 4 = White, 5 = Latinx. We cannot publish faces from the CAFE face set, so we have created exemplars of faces using AI generated photos (see *Appendix B*). Although we provided 5 responses options, we anticipated that some children might respond, “all” or “I don’t know.” If the child says “I don’t know”, we repeated the question once and entered their answer. So far we have “I don’t know” answer for 8 (2%) and “all” for 1 (0.03%) of the 324 trials.

Food Evaluations

After the face-to-food matching task, children were then asked to evaluate each food on a variety of dimensions: Children were asked about how tasty and smelly the food is, how messy it is to eat, whether cool kids eat this food at school and if it is okay to bring it to school. For each question, children first rated the food on a three point scale (for example, “do you think this tastes good, in the middle, or bad?”) and then qualified their response in a follow-up question (for example, if “good,” “is it very good or a little bit good?”). These questions were randomized by Qualtrics for each type of food. The questions were later coded from 0-4, with negative evaluations being 0 and 1, positive evaluations being 3 and 4 (with 2 signifying “in the middle”). After children evaluated the food on all dimensions, they were asked an open question “is there anything else you would like to tell us about this food?”

Parent Questionnaire

Parents are often asked about the considerations of cost, convenience, and healthiness of food they keep in mind while packing lunches (Bathgate & Begley, 2011; Sutter et al., 2019), which we sought to replicate in our parent questionnaire. We created a survey to ask parents about the

factors they keep in mind while packing their children's lunches (see *Appendix C*). On an 11-point scale with 0 being "not at all" and 10 being "a lot," they rated how much they consider convenience (Lunchables, previous day's dinner), health (healthy/unhealthy), cost effectiveness and child food preferences (likes/dislikes). For descriptive measures, we also asked them to report how often their child prepares their own lunchbox and how often parents pack diverse foods, on a 5-point scale ranging from "rarely" to "very often." Finally, parents reported on how often and how important it is for their child to eat food from their culture, both on 5-point scales.

Additionally, parents filled out a media consent form which gave us permission to videotape this interaction and potentially use the audio and video recordings (such as at conferences, for teaching materials, or on our lab website). Families could still participate if they did not consent to videography. Parents finally reported on demographics such as their race, ethnicity, educational attainment, household income, zip code and languages spoken at home.

VIDEO CONFERENCE PROCEDURE

Given the current pandemic situation, all data for this study was conducted via video-chat. Participants were recruited from an existing database of volunteer families, Children Helping Science, an online platform aimed to support researchers run studies virtually, and through word-of-mouth.

Once the online appointment was scheduled, parents were emailed a Qualtrics survey which contains the informed consent, media release form, demographic form, and lunchbox questionnaire that they are requested to fill out ahead of the appointment. Before starting the study, the child's gender was entered on the study survey so the faces on the face-to-food matching task could be gender matched. If the parent indicated "prefer not to respond" for the child's gender, then the gender on the face-to-food task was randomly generated. During the online appointment, we first started recording the session via the WebEx or Zoom video recording feature (if the parent had consented to it), and got the child's oral assent.

Next, our screen was shared with the participant and we took them through some warm-up questions ("How many shapes do you see here?" "Can you do a thumbs-up like me?") to ensure we could see and hear each other properly, and all participants passed this check. Then, we proceeded to take the child through the face-to-food matching and evaluation tasks described previously. The child was emailed a certificate and virtual prize pack (coloring sheets, recipes, crafts, mandala mazes or easy-to-do science experiments) for participating.

Results

PARENT QUESTIONNAIRE

Before reporting our analyses, we first describe the outcomes of the parent questionnaire, as the parent-reported data on how often children took foods from different cultures to school was a predictor in our analyses below. In our sample, 40 of the children take packed lunches to school, 12 of the children have school lunch, 23 children have packed and school lunch, and 5 children do not eat at school. The ages of the 5 children who didn't eat at school ranged from 5-11 years (so it wasn't only that the youngest have not eaten at school yet). On average, parents reported that while packing their children's lunchboxes, they consider the child's food preferences M = 7.9, SD = 1.81, health content M = 7.63, SD = 2.13, convenience M = 5.61, SD = 2.96, and cost effectiveness M = 5.64, SD = 3.03 on a scale from 0-10. Additionally, parental reports on how often the children packed their own lunch, took food from their and other cultures, and the importance of eating food from culture were averaged (*see Appendix F).*

FACE-TO-FOOD MATCHING TASK

To test our first hypothesis on whether children make stereotypic associations between foods and faces, we first ran a chi-square analysis to examine the association between face type and food type, $\chi^2(15, n = 81) = 191.08$, $p < .001$ where children most frequently chose the face we expected to be chosen for the American, Chinese and Indian lunchboxes. For considerations of stereotype consistency, children were scored as making a stereotypic match for the American

lunchbox if they picked either the African-American or the White faces. We found that 57 children matched the White or African American face (White = 48 children, or 59% of the sample; African-American = 9 children, or 11% of the sample) to the American lunchbox, the East Asian face was chosen by 46 (57%) children for the Chinese lunchbox, the South Asian face was chosen by 42 (52%) children for the Indian lunchbox, and the Latinx face was chosen by 22 (27%) children for the Mexican lunchbox (see *Appendix G, Table 8*).

There was individual variability in how many foods were consistently matched to the expected faces across the 4 trials (*see Appendix G, Figure 1*). For example, 15 children matched all four foods to faces based on our *a priori* expectations. Children's modal responses on this task was to match 2 out of 4 (50%); they did not perform better than chance, $t(80) = .26$, $p = .794$. It must be noted that in the following analyses, child age was a continuous variable. We ran a Poisson regression analysis to test whether child age and how often they take foods from different cultures to school (on a scale of 0-4, Mean =1.27) would predict the frequency of children's stereotype-consistent selections across trials. There was an effect of age, $b = 0.07$, $SE = 0.04$ $z = 2.02$, $p < .05$ such that older children were more likely to perform in stereotype-consistent ways on this task. How often children brought diverse foods to school did not predict their overall score, $p = 0.36$ (*see Appendix G, Table 9*).

To see whether children chose the face expected to be chosen according to the food displayed for each trial, we created a binary yes/no variable and conducted a within-subject binary logistic regression analysis with food type, child age, and how often they take foods from different cultures to school as predictors. Here too, we found an age-effect: older children were more likely to make a stereotypical match on each trial, $b = 0.16$, $SE = 0.06$, $z = 2.97$, $p < .01$. Children were less likely to make stereotypical matches for the Mexican lunchbox, $b = -1.85$, $SE = 0.36$, $z = -5.16$, $p < .001$ and Indian lunchbox, $b = -0.78$, $SE = 0.34$, $z = -2.3$, $p < .05$ compared to the American lunchbox (the reference category). How often children brought diverse foods to school did not predict their trial matches, $p = 0.1$(*see Appendix G, Table 10*).

Finally, although we did not tell children they could not repeat faces across the 4 trials (and indeed 18 children, or 22.22% of the sample, repeated a face choice across trials), it is possible

that children considered a face to be excluded from consideration if they had already selected it. To examine this possibility, we re-ran the binary logistic regression analysis using their stereotypical matches on the first trial (when all options were available); 41 (51%) children made a stereotypical match on their first trial. Children were less likely to make a stereotypical match compared to the American lunchbox if the Mexican lunchbox was their first trial, b = -2.02, SE = 0.8, z = -2.53, $p < .05$. Child age (p = .15) and how often children brought diverse foods to school (p = 0.21) did not predict their first trial matches (*see Appendix G, Table 11*).

CHILDREN'S FOOD EVALUATIONS

To first examine whether children differed in their overall evaluations of each lunchbox food, we conducted one-sample t-tests which revealed that each lunchbox was rated positively (averaging across questions, compared to 2, the midpoint rating); American: $t(80)$ =15.36, $p < .001$ (M = 3.04, SD = 0.61); Indian: $t(80)$ = 5.77, $p < .001$ (M = 2.47, SD = 0.74); Chinese: $t(80)$ = 5.37, $p < .001$ (M = 2.48, SD = 0.8); Mexican: $t(80)$ = 6.09, $p < .001$ (M = 2.46, SD = 0.68).

To test the second hypothesis on whether children differ in their evaluations based on food and/or question type, we ran an ordinal logistic regression. This within-subjects ordinal regression used child age, evaluation type (taste, smell, messiness, coolness, alright to bring to school), food type (American, Indian, Chinese, Mexican) and how often children take diverse food to school as predictors with food ratings as the dependent variable. The means of each food by evaluation type are in A*ppendix G, Table 12*. Although children rated the 4 lunchboxes positively overall, they rated the Indian lunchbox, b = -1.35, SE = 0.33, z = -4.13, $p < .001$, Mexican lunchbox, b = -1.53, SE = 0.32, z = -4.73, $p < .001$, and Chinese lunchbox, b = -1.48, SE = 0.33, z = -4.34, $p < .001$ as less positive than the American lunchbox.

Contrary to our predictions that if children rate the foods positively on one dimension, they would rate it positively on all dimensions, participants distinguished between question type. Using taste of the food as the reference group, children rated messiness, b = -1.36, SE = 0.32, z = -4.22, $p < .001$, smell, b = -0.78, SE = 0.33, z = -2.38, $p < .05$, and whether cool kids ate that

food at school, b = -2.18, SE = 0.32, z = -6.88, p < .001 less positively. Child age (p = .129) and whether they took foods from different cultures to school (p = .33) did not influence their ratings.

We also found some interactions between food type and evaluation type (A*ppendix G, Figure 2, Table 13);* the interactions that represent a difference in the magnitude of an effect are described first. The Mexican lunchbox's messiness (M = 1.49) was rated lower than Mexican lunchbox's taste (M = 2.68), and this magnitude of difference was larger than the difference between American lunchbox's messiness and taste, b = -0.96, SE = 0.44, z = -2.17, p < .05. The Indian lunchbox's messiness (M = 1.58) was rated lower than Indian lunchbox's taste (M = 2.79), and this magnitude of difference was larger than the difference between American lunchbox's messiness and taste, b = -0.88, SE = 0.49, z = -2.01, p < .05. The Mexican lunchbox's cool kids (M = 1.94) was rated lower than Mexican lunchbox's taste (M = 2.68), and this magnitude of difference was smaller than the difference between American lunchbox's cool kids and taste, b = 0.92, SE = 0.43, z = 2.16, p < .05. The Chinese lunchbox's "alright to bring to school" (M= 3.36) was rated higher than Chinese lunchbox's taste (M = 2.7), and this magnitude of difference was larger than the difference between American lunchbox's alright to bring to school" and taste, b = 1.13, SE = 0.51, z = 2.28, p < .05. The Mexican lunchbox's "alright to bring to school" (M= 3.4) was rated higher than Mexican lunchbox's taste (M = 2.68) , and this magnitude of difference was larger than the difference between American lunchbox's alright to bring to school" and taste, b = 1.11, SE = 0.49, z = 2.26, p < .05.

There were also interactions that represent the flip of an effect. The smell of the foods was rated higher than the taste for the Mexican, M = 2.78, b = .96, SE = 0.44, z = 2.18, p < .05, and Indian, M = 2.91, b = 1.01, SE = 0.44, z = 2.27, p < .05 lunchboxes whereas the American lunchbox's smell was rated lower than its taste.

RESULTS EXCLUDING CHILDREN WHO DO NOT EAT AT SCHOOL

We repeated the analysis above excluding children who did not eat at school; the overall pattern of results was similar, except that for the Poisson regression analysis, child age as a predictor of children's overall stereotype-consistent matches became marginally significant, b = .07, SE =

0.04, $z = 1.8$, $p = 0.07$. The interaction of Indian smell and taste also became marginally significant: the smell for Indian food was rated higher than the taste $b = .91$, $SE = 0.46$, $z = 1.95$, $p = .051$ whereas the American lunchbox's smell was rated lower than its taste.

Discussion

As predicted, these results suggest that children's stereotypic judgments of what they or their peers from different cultures would typically eat increases with age. Older children were more likely to have stereotype-consistent matches on the face-to-food matching task, indicating that they are able to discern cultural cues in facial stimuli to make decisions on what that person might typically eat. However, the children in our sample were less likely to make stereotypical matches for the Indian and Mexican lunchboxes. One reason why they may not have made the distinction between the Latinx and South Asian faces is that they are phenotypically similar in terms of hair color and skin tone, such that it was harder to distinguish between the two faces. Upon further exploration, we saw that 8 children chose the Latinx face for the Indian lunchbox and South Asian face for the Mexican lunchbox, 6 children chose the South Asian face for the Mexican lunchbox (with some other face for the Indian lunchbox) when the Mexican lunchbox was shown first, and 8 children chose the Latinx face for the Indian lunchbox (with some other face for the Mexican lunchbox) when the Indian lunchbox was shown first. It is conceivable that while children may associate "brown" children as eating those particular ethnic foods, telling their ethnicities apart was harder especially if they have not had much experience differentiating between such faces. This will be important to consider when planning future stimuli for this task.

Another potential concern is in children's interpretation of the task – once they have chosen a face, do they think they can choose that face again? We did not tell them explicitly that they could or could not repeat a face. This has statistical consequences (e.g., it would mean the chance of choosing a face differed across trials, with it being 20% (1/5 faces) for the first trial and 50% (1/2 faces) for the fourth trial) but also conceptual consequences if participants' responses were constrained by a feature of the task (rather than reasoning about the foods and faces presented). More than 50% of the participants made a stereotypical-match on their first trial for both

samples, though children were less likely to make the match if the Mexican lunchbox was their first trial, which is consistent with how they performed on the binary matching for each trial. An alternative way to assess this stereotypical understanding could be to show participants all the foods and faces at once and have them do the matching task with all stimuli present at the same time. Or, children could be shown different faces for each trial though this would also entail testing whether children recognize them as new faces, and the CAFE set does not have pictures of South Asian boys which could be a stimuli limit for this approach.

These results also indicate that while children had positive evaluations of the foods, contrary to our expectations, children made some distinctions between food type and evaluation type across the ethnic foods. Specifically, children rated the Indian, Mexican, and American lunchboxes less positively than the American lunchbox, and evaluated the foods to also be less positive in terms of their messiness, smell, and whether cool kids would bring those foods to school in comparison to the food's taste. Children rated the Mexican and Indian foods to be messier than their taste, and whether cool kids would bring the Mexican food to school less positively than its taste. On the other hand, children had higher ratings for the Chinese and Mexican foods' "alright to bring to school" compared to their taste. Unlike the American food, they thought the Indian and Mexican foods smell more positive than they taste. In this sample, children did not take foods from other cultures to school very often (M= 1.27 on a scale of 0-4) which could be why that variable did not predict children's responses on these tasks. Our findings were similar when we excluded children who did not eat at school.

Given that qualitative research has retrospectively examined adult's experiences with lunchtime at school (Guendelman et al., 2011; Salazaar, 2007), we aimed at extending our findings from the child sample by systematically exploring how adults would view these ethnic foods in the context of a school lunchbox. Specifically, we expected adults to perform in more stereotype-consistent ways given the potential that they would have increased exposure to and familiarity with foods from different cultures compared to children.

CHAPTER III: ADULT SAMPLE

In this section, we detail our comparison adult dataset where participants completed the same measures as in the child sample via a self-reported survey.

Participants

Participants from Guilford Technical Community College (GTCC) received course credit in exchange for taking our survey. In this sample, 328 adult participants clicked our parent survey that had both this study and an unrelated study (the order counter-balanced). Of those participants, we had 114 responses when Lunchbox was the first study, and 67 when Lunchbox was the second study. 19 out of the 181 respondents did not consent or consented but didn't fill anything else and were excluded from analysis. We excluded another 3 participants who had completed 7 or fewer questions (20%, the similar cutoff for the child-sample), and another 8 participants who stated their age was below 18 in the demographics even though the consent statement affirms that by continuing the study they must be at least 18 years old. Our final usable sample size for this adult comparison set was n = 151 (M_{age} = 24.73 years, $Range_{age}$= 18-54 years, SD_{age} = 7.49, 62% female, 78 % Not Hispanic or Latino, 42 % White) (see *Appendix E, Table 5& 6*). In this sample, 16 were parents with children who were of school age or had started kindergarten in the 2019-2020 (indicating their child had some experience with eating food in school, pre-COVID 19).

Materials

The adults answered the same questions as the children in Study 1, with the following exceptions: In addition to the five food evaluation questions that are asked in the child sample for each lunchbox, the adult participants were also asked about each food's familiarity ("When you were a child, how familiar was this food to you?") and perceived disgust ("Is it disgusting or not disgusting to bring this food to school?"). The response options follow the same 5-point format

as above. Participants were also asked to report what foods they see in each lunchbox, which gives us insight to how the contents were perceived. Furthermore, participants were asked to reflect and share any negative experiences they remember having as a child during lunch time at school in general and specifically related to food through two open-ended questions. These retrospective methods are akin to those used in prior work (Guendelman et al., 2011). Adults were also asked to complete the Food Fussiness subscale of the Adult Eating Behavior Questionnaire (AEBQ), which is the adult variation of the Child Eating Behavior Questionnaire that measures appetitive traits (Hunot et al., 2016). The 5-item subscale measures self-reported food pickiness on a 5-point scale with 1 being "never" and 5 being "always." The items are: 1) I enjoy a wide variety of foods, 2) I enjoy tasting new foods 3) I am interested in tasting new foods I haven't tasted before 4) I refuse new foods as first and 5) I often decide that I don't like a food before tasting it. The first three items were reverse coded, so that higher ratings indicate more food pickiness. The scores were averaged to give a single pickiness score per participant.

Procedure

For the GTCC adult sample, participants signed-up via their study-pool system to jointly take our questionnaire and a survey for an unrelated study (the order is counter-balanced across trials). Our adult questionnaire followed a similar format as in the child sample. The participant first consented to take the study, then attempted the face-to-food matching task (the gender of the child face was randomized across trials; 81 participants in the final dataset saw girl faces, 70 saw boy faces) and evaluated each food. For the face-to-food matching, participants could see the "all" and "don't know" options explicitly on their screen. Out of the 604 trials, the "all" option was chosen 50 times and "don't know" was entered 35 times. If they indicated that they are a parent of a child of school age or have child(ren) who started kindergarten in 2019-2020, they were shown the parent lunchbox questionnaire. Participants were then given the AEBQ, retrospectively reflected on their school lunch time experiences, and filled out demographics. Participants received a unique code at the end of the survey which they used to reclaim course credit.

Results

ADULT'S PERFORMANCE ON THE FACE-TO-FOOD MATCHING TASK

For the face-to-food matching task, a chi-square analyses revealed that participants chose the *apriori* expected face most frequently for each food, $\chi^2(15, n= 151)=937.45$, $p < 0.001$. We found that 109 adults children matched the White or African American face (White = 85 participants, or 56% of the sample; African-American = 24 participants, or 16% of the sample) to the American lunchbox, the East Asian face was chosen by 128 (85%) participants for the Chinese lunchbox, the South Asian face was chosen by 96 (64%) participants for the Indian lunchbox, and the Latinx face was chosen by 89 (59 %) participants for the Mexican lunchbox (see *Appendix H, Table 14*). In this adult sample, a higher proportion of participants performed in a stereotype-consistent way: 56 participants consistently matched all four foods with the faces based on *a priori* expectations (see *Appendix H, Figure 3*). Participant's modal responses on this task was a 4; they performed in stereotypically-consistent ways more often than would be expected by chance, $t(150) = 8.05$, $p < .001$. We ran a Poisson regression analysis to test whether participant age ($p = 0.311$) and their food pickiness (AEBQ score, $p = 0.364$) would predict the frequency of their stereotype-consistent selections across trials; neither was associated with their overall performance on this task (see *Appendix H, Table 15*).

To see whether the adults chose the face expected to be chosen according to the food displayed for each trial, we created a binary yes/no variable and conducted a within-subject binary logistic regression analysis with food type, age, and AEBQ score as predictors. Here, they were less likely to make stereotypical matches for the Mexican lunchbox, $b = -0.55$, $SE = 0.26$, $z = -2.15$, $p < .05$ and more likely to make the match for the Chinese lunchbox, $b = 0.79$, $SE = 0.30$, $z = 2.6$, $p < .01$, compared to the American lunchbox. Their age was marginally significant, $b = 0.27$, $SE = 0.01$, $z = 1.91$, $p = .06$, and their food pickiness did not predict their matches per trial, $p = .097$ (see *Appendix H, Table 16*). With regards to their first trial match, 102 (68%) participants made a stereotypical match on their first trial. They were more likely to make a stereotypical match compared to the American lunchbox if the Chinese lunchbox was their first trial, $b = 1.65$, $SE =$

0.64, $z = 2.57$, $p < .05$. Participants with higher AEBQ scores (meaning that they are pickier eaters) were less likely to make stereotype-consistent matches on their first trial, $b = -0.55$, $SE = 0.22$, $z = 2.46$, $p < .05$ (see *Appendix H, Table 17*). 20 (13%) participants repeated faces across trials.

ADULT'S FOOD EVALUATIONS

First, one-sample t-tests revealed that each lunchbox was rated positively (averaging across questions, compared to 2, the midpoint rating); American: $t(147) = 9.35$ $p < .001$ ($M = 2.56$, $SD = 0.73$); Indian: $t(148) = 2.53$, $p < .05$ ($M = 2.18$, $SD = 0.86$); Chinese: $t(150) = 15.74$, $p < .001$ ($M = 2.84$, $SD = 0.65$); Mexican: $t(148) = 14.08$, $p < .001$ ($M = 2.77$, $SD = 0.67$).

We then ran a within-subjects ordinal logistic regression to explore the food type x evaluation type interaction for the adult sample. This regression used age, AEBQ score, evaluation type (taste, smell, messiness, coolness, alright to bring to school, familiarity of food, disgust), and food type (American, Indian, Chinese, Mexican) as predictors with food ratings as the dependent variable. The means of each food by evaluation type are in A*ppendix H, Table 18*. While adults rated the 4 lunchboxes positively overall, considering the effect of food type, they rated the Chinese lunchbox, $b = 1.55$, $SE = 0.23$, $z = 6.71$, $p < .001$ and Mexican lunchbox, $b = 0.87$, $SE = 0.22$, $z = 4.01$, $p < .001$ as more positive than the American lunchbox (see *Appendix H, Table 19*). With taste of the food as the reference group, adults gave less positive ratings when asked about disgust, $b = -0.46$, $SE = 0.23$, $z = -1.99$, $p < .05$, whether cool kids ate that food at school, $b = -0.82$, $SE = 0.22$, $z = -3.64$, $p < .001$ and alright to bring to school, $b = -0.59$, $SE = 0.24$, $z = -2.48$, $p < .05$. They provided higher ratings when asked about familiarity, $b = 1.29$, $SE = 0.24$, $z = 5.5$, $p < .001$ and messiness, $b = 0.92$, $SE = 0.22$, $z = 4.15$, $p < .001$ (again compared to taste, the reference category). The more picky the adults were, the less positive their food evaluations, $b = -0.32$, $SE = 0.07$, $z = -4.55$, $p < .001$. On further exploration, adult's average pickiness scores generated from the AEBQ were negatively correlated with their average ratings of each food, but were significant only for the ethnic foods: Indian $r = -.216$, $p < .01$, Chinese $r = -.38$, $p < .01$, Mexican $r = -.34$, $p < .01$, whereas American $r = -0.081$, $p = .896$.

There were many interactions between food type and evaluation type (A*ppendix H, Figure 4);* the interactions that represent a difference in the magnitude of an effect are described first. For all the foods, whether cool kids bring it to school was rated lower than the taste, and this magnitude of difference was larger for the Chinese, M = 1.81, b = -1.74, SE = 0.33, z = -5.26, p <.001, Mexican, M = 1.91, b = -0.94, SE = 0.32, z = -2.93, p <.01, and Indian, M = 1.32, b = -0.93, SE = 0.332, z = -2.79, p <.01 lunchboxes than the difference between American lunchbox's cool kids (M = 2.0) and taste.

There were also interactions that represent the flip of an effect. For disgust, the Mexican lunchbox's disgust (M = 3.52) was rated higher than Mexican lunchbox's taste, (M = 3.13), b = 1.551, SE = 0.34, z = 4.55, p < .001 The Indian lunchbox's disgust (M = 3.21) was rated higher than Indian lunchbox's taste (M = 2.61), b = 1.70, SE = 0.38, z = 5.05, p < .001, whereas the American lunchbox's disgust was rated lower than its taste.

Additionally, the familiarity of the foods when participants' were children was rated lower than the taste for the Chinese, M = 2.84, b = -2.22, SE = 0.34, z = -6.58, p < .001, Mexican, M = 2.28, b = -2.49, SE = 0.33, z = -7.65, p <.001, and Indian, M = 0.99, b = -3.85, SE = 0.33, z = -11.4, p < .001 lunchboxes whereas the American lunchbox's familiarity (M = 3.18) was higher than its taste. Similarly, the messiness of the foods was rated lower than the taste for the Chinese, M = 2.11, b = -3.15, SE = 0.33, z = -9.68, p <.001, Mexican, M = 1.56, b = -3.14, SE = 0.31, z = -10.08, p <.001, and Indian, M = 1.65, b = -2.26, SE = 0.31, z = -7.23, p <.001 lunchboxes whereas the American lunchbox's messiness was rated higher than its taste. The Indian lunchbox's "alright to bring to school" was rated lower than Indian lunchbox's taste M = 3.39, b = 2.20, SE = 0.35, z = 6.38, p <.001 and the Mexican lunchbox's "alright to bring to school" was rated higher than Mexican lunchbox's taste, M= 3.6, b = 1.87, SE = 0.35, z = 5.35, p < .001 3.43) whereas the American lunchbox's "alright to bring to school" (M = 2.07) was lower than taste.

OPEN-ENDED QUESTIONS

Participants reported on negative experiences with respect to the food and lunchtime in general. 48% of the participants reported having no negative experiences, 12% said just yes with no

description. 17% gave description of food served at school, such as “lunch food was nasty and disgusting” or “they did not serve what I wanted to eat.” 3% of the participants described food taken from home, such as “I remember sometimes kids would think my food from home was a little weird,” and 1% described an allergic reaction. 12% of the participants reflected on lunch time in general such as “there was drama at school” and 4% mentioned cost in their responses, “I couldn’t afford to purchase food.” Thus, most of our sample did not report negative experiences with lunch at school, and an even fewer proportion reported experiences with packed lunches. When asked to identify the foods, 33 participants said the Indian food was ravioli, which is something to keep in mind when planning future stimuli.

Discussion

These results show that adults made more stereotypic-matches across the face-to-food trials, and were more likely to match the East Asian face with the Chinese lunchbox, but were less likely to do so for the Mexican lunchbox compared to the American lunchbox. Since we looked at age continuously in both samples, our results suggest that awareness of who might conventionally eat what food appears to increase with age. We know that explicit intergroup preferences decreases with age, but implicit attitudes are more stable such that children also demonstrate adultlike intergroup implicit preferences (Dunham et al., 2008). It could be that this phenomenon, coupled with the knowledge of cultural foods and ability to categorize faces of different races is what predicted older children’s and adult’s stereotype-consistent performances on this task.

Unlike the children, adults rated the Mexican and Chinese foods more positively than the American lunchbox perhaps because they looked more like something an adult would eat. For the ethnic foods, adults had larger magnitudes of difference for whether cool kids would bring those to school, compared to the American lunchbox’s evaluations of cool and taste. They had inverse associations with the messiness of those foods and the familiarity of those foods when they were children, rating them lower than taste whereas the American food was more familiar and less messy compared to its taste. They had less negative perceived disgust towards the Indian and Mexican foods compared to the taste (and rated the American food’s disgust higher than its

taste). Social desirability biases may have influenced this rating: expressing that food from another culture is disgusting deviates from norms of tolerance and adults may have responded in more socially acceptable ways for this question. Moreover, individual differences also predicted their ratings, as participants had less positive evaluations of the ethnic foods when they self-reported higher food pickiness. In all, these findings suggest that adults had stronger negative evaluations towards the Mexican, Chinese, and Indian foods compared to the American lunchbox as they rated those foods lower than taste based on multiple dimensions.

Our child and adult sample data reveal how certain individual differences such as participant's age (for children) and food pickiness (for adults) can influence their performance on these tasks. The next study sought to explore whether a contextual factor, participants' neighborhood cultural diversity, would explain additional variance in our participants' responses.

CHAPTER IV: NEIGHBORHOOD DIVERSITY

In this section of the project, we were interested in examining whether the cultural diversity of participants' neighborhoods, indexed through U.S. Census ZIP code data, would predict their stereotype-consistent matches and food evaluations.

Materials and Procedure

In the demographics questionnaire, we asked participants to report their ZIP code and race and ethnicity. In the child sample, we also asked parents to report on the languages spoken at home—all 81 families reported English as a language spoken at home, and 26 of them spoke at least one other language in addition to English (e.g., Tamil, Russian). We had 5 missing zip codes for children and 13 missing zip codes from the adult sample. In the adult sample, 12 said they were Not Hispanic or Latino but did not provide their race, 2 did not provide either and were excluded from this analysis. Language information was not collected for the adult sample.

Using the 2019 American Community Survey (ACS, U.S. Census Bureau, 2019), we extracted the proportion of outgroup members in the participant's zip code, that is, the proportion of people who were not the same race as the participant, or spoke the same languages as the child as children's acceptance of labeled foreign foods is associated with the proportion of racial and linguistic outgroup members in their neighborhoods (Hwang et al., 2021). The procedures for these calculations were modeled off the method in Hwang et al. (2020, 2021). For example, a Hispanic White participant's *racial outgroup* was everyone who was not Hispanic and White in the neighborhood.

For children, a bilingual English-Tamil speaking child's *linguistic outgroup* was everyone who did not speak English and an Indo-European language in the neighborhood. The racial and linguistic outgroup values were not related to each other (r = -0.05, p = .67) and were summed to give an *outgroup composite score*, where higher values indicate more cultural diversity in the child's neighborhood. We re-ran our regression analyses from Studies 1 and 2 with the outgroup

composite (for children in Study 1) or the racial outgroup (for adults in Study 2) as an additional predictor to see if it explained additional variance in the model.

Results

Child sample

Children's outgroup composite did not predict their overall performance on the face-to-food matching task, over and above a model containing their age and whether they took foods from different cultures to school often, $p = 0.83$ (*see Appendix I, Table 20*). Similarly, the outgroup composite did not predict their stereotype-consistent matches per trial in the within-subject binary logistic regression analysis, $p = 0.836$. For both analyses, adding the outgroup composite did not change the significant effects that were found earlier (*see Appendix I, Table 21*). In the within-subjects ordinal regression assessing the interactions of food and evaluation type on children's lunchbox ratings, the outgroup composite did not influence their ratings, $p = 0.104$. However, the addition of this predictor to the model also turned the interaction between Indian food and messiness ($p = 0.106$) and Mexican food and messiness ($p = .086$) non-significant. The other interactions stayed the same (*see Appendix I, Table 22*). Hence, children's neighborhood diversity did not influence their performance on these tasks.

Adult sample

Adult's racial outgroup did not predict their overall performance on the face-to-food matching task, over and above a model containing their age and food pickiness scores, $p = 0.115$ (*see Appendix I, Table 23*). The racial outgroup predicted their stereotype-consistent matches per trial in the within-subject binary logistic regression analysis: the more racially diverse their neighborhood, the more likely they were to make a stereotype-match, $b = 1.25$, $SE = 0.41$, $z = 3.052$, $p < .01$. After adding the racial outgroup, the AEBQ predicted participants performance on individual trials: The pickier the participant, the less likely they were to make stereotypic-matches per trial, $b = -0.24$, $SE = 0.12$, $z = -2.04$, $p < .05$.(*see Appendix I, Table 24*). In the

within-subjects ordinal regression assessing the interactions of food and evaluation type on adult's lunchbox ratings, racial outgroup was not associated with their ratings, $p = 0.219$ or change any of the existing effects or interactions (*see Appendix I, Table 25*).

Thus, in this study, we found that adults who resided in neighborhoods with higher racial outgroup members performed in more stereotype-consistent ways on the face-to-food matching task, but that did not influence their food evaluations. On the one hand, it is conceivable that adults who lives in neighborhoods with higher racial diversity would in fact have more openness towards who can eat what types of food which could have been associated with more stereotype-inconsistent choices. However, this finding supports the opposite explanation, or that the more exposure and familiarity adults have to people from different races, the more attuned they are to making a stereotypic match of what people are likely to eat. Indeed, heightened stereotype-prevalence increases likelihood of performing in stereotype-consistent ways (Duguid & Thomas-Hunt, 2015). Children's neighborhood diversity did not predict their performance on either task, the potential reasons for which are discussed further in the general discussion.

CHAPTER V: GENERAL DISCUSSION

These studies examined whether children show stereotypic judgments that their peers of different races and ethnicities might typically eat different foods, and how children evaluate various types of lunchbox foods. We also had a comparison adult data set and tested whether neighborhood diversity statistics based on the U.S. Census would influence participants' responses.

The first takeaway from our child sample is that with age, children demonstrate increased stereotypes with respect to who is most likely to eat what. Older children were more likely to make stereotype-consistent matches in the face-to-food matching task overall and on each trial. This finding is consistent with previous research which demonstrates that race salience increases with child's age and race essentialism also increases with age for children in more homogenous racial contexts (Pauker et al., 2016). Older children show traditional stereotype-consistent choices with regards to individual's race and status (Rowley et al., 2007) compared to younger children. By middle childhood, children might have more exposure to lunchtime at school, and what their peers of different races and ethnicities are likely to eat.

With respect to their evaluations of lunchbox foods in this study, children rated all four foods positively, with the American food receiving more positive evaluations compared to the Chinese, Mexican, and Indian lunchboxes. These results are akin to the findings in qualitative studies which have assessed children's attitudes towards lunchbox foods that are not conventional sandwiches (Karrebæk, 2012; Ludvigsen & Scott, 2009; Vasquez, 2013). However, a further look at the food evaluation yields interesting results. Children rated all foods as being alright to bring to school (not different from taste), especially for the Chinese and Mexican lunchboxes. In *Figure 2*, children's mean rating for whether the food was alright to bring to school was above 3.3 (on a scale of 4) for all four foods, indicating that they think it is okay to bring any of these foods (American and non-American) to school. At first blush, these ratings seem to challenge previous qualitative and observational work that highlight how children who bring non-American or non-normative foods to school are excluded by their peers (Karrebæk, 2012;

Salazar, 2007). If a majority White sample of children think that any food is very alright to bring to school, then why was Akshay teased for the contents of his lunchbox?

There are a few possible explanations for these findings. First, social desirability biases may have fed into children's responses in their positive evaluations of the foods, as for instance, one 9-year-old child asked, "did I answer everything politically correct?" at the end of the study. Children could have provided what seems like more socially acceptable responses about these foods. Secondly, the contextual influence of the COVID-19 pandemic must be taken into consideration. Children have potentially not been to school in-person for a year, and even children who have returned to school in-person may have different lunch experiences in school as they typically would pre-pandemic. We don't know if their responses were based on recollection from time at school before virtual schooling set in, especially for the younger children (if so, it could also be imperfect recall given how long it has been since in-person school) instead of on recent experiences with lunch at school. Thirdly, though this was not tested, parental feeding behaviors could impact how children think about these foods. Four parents indicated that their children "eat a wide variety of foods" or they are "not fussy eaters" in their consent forms, and a parent mentioned that they tell their children, "food is a personal experience and it's okay for anyone to eat what they want." Such messages could shape children's acceptance of different types of foods, though this would have to be explicitly measured. In addition, children's own food pickiness could influence their ratings which is discussed below. Further, children could be interpreting the question in a couple of ways: "It's alright for me to bring it," versus "I wouldn't bring it but it's alright for someone else to bring this food." It would be valuable to systematically parse out their interpretation as it would indicate whether children are rating these foods as alright to bring to school from one's own perspective or their peers'. Herein, it is also worth mentioning that there might have been a social influence of my position as an Indian researcher asking American children of different races and ethnicities these questions. Does et al. (2018) contend that we emphasize publishing the demographics of our sample, but we rarely specify the demographics of the experimenter which can also nonverbally play a role in participants responses.

Notwithstanding children's positive ratings on the food's "alright to bring to school" and taste, children also rated the foods' messiness, smell, and coolness less positively than taste. While they thought these foods were alright to bring to school, they didn't necessarily think cool kids would eat these foods at school and they rated those foods as messier and smellier compared to their taste. Thus, contrary to our expectation that children would rate the foods similarly on different dimensions, they appear to think of the foods differently based on question type. Compared to taste, children thought cool kids might be less likely to eat these foods. The Indian and Mexican foods were thought to be messier but smell better than their taste, compared to the American food's taste. Children do make social judgments about foods based on their popularity with other children (DeJesus et al., 2018), and negatively judge those who have unconventional food choices (DeJesus et al., 2019). It is plausible they are making evaluations about the food based on who might eat it (or placing attributes to the faces they saw in the face-to-food matching) which will be an aspect future studies can examine.

While children's knowledge of these notions of conventionality could reflect their cultural awareness in terms of foods from different cultures, we cannot infer how these judgments would influence their prejudice and behavior towards peers bringing such foods to school. Would children sit next to a peer who brings a lunchbox different to their own? Would they be comfortable visiting that peer's house for a meal? Devine's (1989) seminal work on prejudice highlights that high and low prejudiced people are both equally aware of cultural stereotypes, and hence, it will be important to parse out children's judgments of who might eat what with respect to how it translates to their prejudices and behavior. Some ideas for these next steps are outlined later in this document.

Moving on to the adult sample, adults made more stereotypic-matches across the trials, and despite having the "all" option explicitly (unlike the children) for making their choices, adults still matched the expected face to the food most often rather than choosing "all" or exhibiting stereotype-inconsistent matches. Both children and adults chose the White American face more often than the African-American face for the American lunchbox, implying that the default for the American food is what the White child would eat. Developmentally, our data suggests that

older children and adults are more likely to make stereotype-consistent matches per trial. It appears that by middle childhood, children are better able to recognize facial cultural cues and have had more exposure to diverse foods and faces which continues to adulthood. Although, like the children, adults were also less likely to make stereotype consistent matches for Mexican food and the Latinx face, which suggests that it would be informative to gain a better understanding about their knowledge of diverse racial and ethnic faces and the inferences they make about those faces especially in the context of food preferences.

Adults performed differently than children in their food evaluations, in that they rated the Chinese and Mexican foods more positive than the American, and rated the foods' alright to bring to school less positive than taste. It is possible than adult ratings could have been confounded by how they conflated viewing these foods retrospectively to when they were in school, versus their opinions of those foods as grown-ups. They also rated the non-American lunchboxes to be messier, less likely to be brought by cool kids, and less familiar to them as a child with reference to the taste. Here, it is important to note that our oldest participant was 54 years old. Our broad age-range of adult participants lends insight to inter-generational differences in perceptions of diversity and conventionality in school settings. What was considered normative to bring to school and what diversity in classrooms looked like almost 4 decades ago could be more restricted compared to what it is for children today, which could be one potential reason why the ethnic foods received lower ratings on these dimensions compared to the American lunchbox. Indeed, American public schools in 1995 were made up of 65.8% White students, which decreased to 49.8% in 2014, and is projected to further reduce to 45.1% by 2023, with increasing proportions of Hispanic and Asian children in these settings (National Center for Education Statistics, 2014).

Another interesting finding from the adult data is the inverse association between participant's food pickiness and their ratings of the ethnic foods. Higher food neophobia, or the aversiveness to try new foods has been linked to lower familiarity and willingness to try non-traditional ethnic foods among Korean adults (Choe & Cho, 2011). Our participants had lower evaluations of the

foods when they self-reported higher food pickiness, which is reflective of their hesitancy toward foods that may not be as conventional or familiar.

Finally, we found that neighborhood diversity had null effects for our child sample. One potential reason why this was so is that the value of such "distal social contexts" (Howard et al., 2014) lies in children being exposed to racial and linguistic outgroup members in public spaces like supermarkets, parks or public transport in their neighborhoods. This year with the pandemic has interrupted children's exposure to the outside world, especially such public spaces. It could be that while some of our participants reside in neighborhoods with higher proportions of outgroup members, they have not been exposed to these members or even frequented restaurants and eateries this past year. On the other hand, higher racial diversity in adult's neighborhoods made them more likely to have stereotype-consistent matches per trial in the face-to-food matching task. Higher prevalence of stereotyping messages is associated with higher stereotype-consistent responses (Duguid & Thomas-Hunt, 2015). In this way, it is possible that adults who had more exposure to people from different racial backgrounds potentially eating their cultural foods in their neighborhoods could be more attuned to making such stereotype-consistent matches. It is also possible that adults could be less susceptible to the changes in exposure during the pandemic compared to the children. Adults could have had more awareness of their neighborhood diversity before being confined at home this year, and also potentially have moved around for errands and work more than children have during COVID-19. Yet, this exposure did not predict their food ratings, possibly because individual differences such as food pickiness impact that relationship.

Limitations

This study's findings should be viewed in light of its limitations. There are two features of our stimuli that could potentially have made particular images more salient. In the face-to-food matching task, the faces for each race/ethnicity were chosen at random from the CAFE dataset. However, the White-American child's blonde hair compared to the other children's brunette/black hair might have made them more distinct. In the CAFE data set, there are 42

White-American children with blonde hair, and 16 with medium-light brown hair. Hence, a different White-American face with darker hair could be used in future related studies to make the faces more uniform. Also, all four lunchboxes were constructed to be uniform in terms of having at least one food that requires a utensil. However, the chopsticks in the Chinese lunchbox could have made the food more salient than the others. For instance, it is the food that received the highest number of stereotype-matches across trials in the adult sample, and they were more likely to make a stereotype-match for the trial with the Chinese lunchbox compared to the American lunchbox. If this picture is used in future studies, the chopsticks could be edited to a fork instead. Additionally, 33 adults mentioned that the Indian food was ravioli, intimating their unfamiliarity with the food. We did not ask children what they thought was in each of the boxes which could measure the representativeness of the stimuli and children's exposure to these foods. It would be a useful check to have for future iterations of this project.

The sample is restricted in its diversity with respect to participants' race/ethnicity and parent background. 32 of my participants were recruited from Children Helping Science, which is frequented by parents who are researchers/faculty themselves who are probably familiar with online testing. The families in this study were in the higher socio-economic range (40% of the sample had combined annual income of $90,00 and higher) and that might influence their availability and exposure to different kinds of foods compared to children from lower socioeconomic backgrounds who may rely more on school provided lunches.

Though we have almost reached my initial target n=85 children based on the initial power analysis, we added a predictor with the neighborhood outgroup variable after the *apriori* power analyses, and hence this study is currently underpowered. A G-Power analysis for the full model in the child sample of 6 predictors indicates an n= 98. We will continue data collection until we reach this n before we re-run the analysis for a potential manuscript publication. It has been harder than usual to schedule families for study sessions this year, given our reduced recruitment activities and that around 10 families explicitly declined to participate because their children are "Zoomed out" (understandably so).

Future Directions

There is a broad range of questions that can be tested in subsequent versions of this study. Parental reports reveal that higher child food neophobia is related to lower pleasantness ratings and familiarity with foods from typical food groups (Mustonen et al., 2012). Given the association between food pickiness and adults' performance on the tasks, we hope to be able to examine the associations between how children's picky eating might relate to their familiarity with and evaluations of ethnic foods in the next version of this study. Higher food pickiness is related to lower acceptance of unfamiliar foods (Dovey et al., 2008), so pickiness might influence evaluations of other culture's foods as well. Specifically, does a child's pickiness predict whether they think it is alright to bring an unfamiliar food to school? Considering that familiarity generally increases acceptance of foods (DeJesus et al., 2019), it would also be interesting to explicitly measure children's prior exposure to these foods as that might influence their acceptance of the foods.

In addition to the zip code analyses presented here, there are alternative ways in which the proportion of children's outgroup members in the context of their lived environments can be measured. With IRB approval, if parents share the name of their children's school, we can calculate the diversity statistics and proportion of outgroup members in the child's school. Such data will provide a more accurate representation of normativity as foods that are considered conventional to bring to school could differ based on the school's demographic makeup—for instance, what is conventional to bring to school in Alston Ridge Elementary, NC which is ~52% Asian might (or might not) be different to what the convention is in Hodge Road Elementary, NC which is ~55% Hispanic. Furthermore, while ZIP codes provide key information about cultural diversity in one's neighborhood, they do not convey the quality or quantity of families' interaction with racial or linguistic outgroup members. Neighborhood trust surveys and parental reports of the interactions with residents in their community (Hwang et al., 2021) will be a useful addition to the diversity measures. This way, we will not only be able to capture the quantitative proportion of diversity in the child's neighborhood, but also give meaning to what that diversity

can imply for children's behaviors and responses based on their actual interactions with members of those groups.

It would also be interesting to conduct a variation of this study in a racially homogenous school setting such as Indian schools in Dubai. Dubai's population is comprised of 88.5% expats (Global Media Insight, 2020), and there are schools that cater to particular ethnicities. Are there within-group expectations on what is alright to bring in a school lunchbox? We envision testing in an Indian school in Dubai, for instance, where all the students are ethnically Indians, but there could be variations in what they bring to school to eat. Herein, it will be informative to parse out whether children other their peers or feel othered for the food they bring even though they all share a common ethnicity and do not saliently look different from one another.

Lunchbox is limited by the fact that we do not have children's report on what they individually eat at school, whether it is packed or school lunch. Previous studies using secondary data sets, such as the NHANES 24-hour dietary recall data have examined the nutrient contents of school lunches and frequency of meals eaten at school (Shankaranarayanan & Miketinas, 2020; Vernarelli & O'Brien, 2017), and have compared packed versus school lunches as they relate to fruit and vegetable consumption in youth (Taylor et al., 2019). Here, it would be valuable to further analyze this data with respect to children's racial/ethnic background. Existing data briefs have explored breakfast foods that children and adolescents consume, and how that quantitatively differs across demographic variables and age-groups (Terry et al., 2020). We thought it would be useful to conduct a similar analysis for children's lunch contents, and examine lunch food contents by children's race and ethnicity. A big data analysis using a nationally representative sample would help lend more insight to the contents of packed lunches by different demographics.

Finally, this study can be bolstered by measuring children's behavioral responses to potential food-related discriminatory experiences. It is possible that in this version of the study, children rated the foods as foods in and of themselves, rather than as foods from home taken to school to be eaten in the presence of one's peers. Herein, having behavioral and physiological responses in addition to children's evaluations will augment the implications of our findings. We would like

to assess how food-related discrimination experiences at school could be related to child stress, indexed physiologically with salivary cortisol. Perceived discrimination in youth is associated with increased cortisol output, as seen in Mexican American adolescents whose higher levels of perceived discrimination was related to a heightened cortisol output (Zeiders et al., 2012). This could be an experimental manipulation, where school-age children could be assigned to a positive or negative condition, and made to identify through an ingroup manipulation with either the person bringing a nonconventional food to school, or watching someone eat that nonconventional food at school. Children's salivary cortisol could be measured at baseline and post the manipulation to assess whether perceived discrimination towards food in a school lunch setting influences child's distress responses.

One implication of experiences with food discrimination is that individuals make food choices which could lead to adverse health outcomes, especially obesogenic behaviors. More acculturated ethnic minority individuals succumb to eating foods higher in metabolic risk as examined in South Asian school-age immigrant children (Noor et al., 2020) and Mexican American children (Batis et al., 2011), and choose foods higher in calorie intake when their American identity is threatened as seen in Asian American adults (Guendelman et al., 2011). Whereas, Latino youth with integrated (or bicultural) orientation are more likely to have healthier food intake (Arandia et al., 2018). In this way, associations of negative (or positive) school lunchroom experiences could be a factor that influences children's food acculturation and eating behavior, among other socio-emotional outcomes. This study takes a first step in examining children's perceptions of ethnic foods in a school setting, which is an indicative precursor of myriad social outcomes, from children's ingroup-outgroup food preferences, instances of isolation and bullying, to children's longitudinal ethnic identification with foods from their own cultures. In the end, Akshay's mother served her homemade biryani to Akshay's multiracial adolescent friends. Their enjoyment of the spices and flavor was the validation Akshay needed to rekindle his liking for the food that was once used to discriminate, but now united him with his peers.

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APPENDIX A: FOOD STIMULI

 American	 Chinese
 Indian	 Mexican

APPENDIX B: SAMPLE STIMULI FOR THE FACE-TO-FOOD MATCHING TASK

Note: These are not the pictures of the faces participants saw. The faces pictured have been AI generated for demonstration purposes, https://generated.photos/faces

APPENDIX C: PARENT QUESTIONNAIRE

Please answer the following questions regarding the food your child eats at school (on average):

1.What kind of lunch or snack does your child take to school?

- o Packed lunch
- o School lunch
- o Both packed and school lunch
- o Child does not eat at school

2. How much do you keep these factors in mind when deciding what your child eats for lunch?

- o Child's food preferences (likes/dislikes)
- o Convenience (lunchables, previous day's dinner)
- o Health content (healthy/unhealthy)
- o Cost effectiveness

3. How often does your child pack their own lunchbox? Very often, Often, Sometimes, Not very often, or Rarely.

4. How often does your child take food from your culture to school? Very often, Often, Sometimes, Not very often, or Rarely.

5. How important is it for your child to eat food from your culture? Very important, Important, Neutral, Not important, or Not at all important.

6. How often do you pack food from different cultures in your child's lunchbox? Very often, Often, Sometimes, Not very often, or Rarely.

APPENDIX D: PILOT DATA

Participants

Since I created my own stimuli, we decided to run a pilot survey to test the materials. We had 100 (M_{age} = 35.51 years, SD_{age} = 10.93 years, 53 female) participants from the United States on Amazon TurkPrime fill out a modified version of the survey. 88 participants identified as not Hispanic or Latino; 81 identified as Caucasian or White, 10 as African-American or Black and 2 as Asian. We had 3 mixed-race participants and 3 did not specify their ethnicity. Out of the 100 participants, 31 were parents. Subjects were compensated $0.50 for their participation. The average response time was 121.7 seconds (about 2 minutes).

Procedure

After consenting to take part in our study, participants were asked to complete the face-to-food matching question for all four ethnic foods. The gender of the child faces was randomly assigned, so 50 participants saw boy faces and the other 50 saw girl faces. Participants had the option of an open-ended response to tell us anything more about that food if they would like. Then, if the participants indicated that they are parents, they were asked to complete the parent questionnaire. Finally, all participants reported on their demographics including sex, race, age and ethnicity. Note that the American food shown here was white bread sandwich, tangerines and goldfish crackers—the mac and cheese was added after the pilot.

Results

The data for the face-to-food matching question revealed that our *a priori* expectations of the child most likely to bring the food to school was matched for each food type, i.e, had the higher number of responses, lending support for the representativeness of the contents of the lunchbox. We used Preacher's (2001) chi-square calculator. Our tests revealed that across girls, $\chi^2(18, n = 50) = 116.522$, $p < .001$), boys, $\chi^2(18, n = 50) = 246.86$, $p < .001$) and collapsed together, χ^2(18,

$n = 50) = 337.395$, $p < .001$ (See Table 1, 2 and 3), we observed a significant association between face type and food type, and the most frequent responses matched our hypothesis. For example, 64 participants matched the East Asian face to the picture of the Chinese lunchbox. The lunchbox containing the sandwich had the highest "all" rating. Only 6 participants put "all" for each food.

For the parent questionnaire, responses ranged from 1-10 on the factors parents keep in mind when deciding what their child eats for lunch. Similarly, for the questions on culture and how often the child packs their own lunch, responses ranged through all 5 response options. This indicates that our questions tap a range of possibilities. To note, we added the question on how often the child takes diverse foods to school after running the pilot. Finally, in the open-ended question, participants indicated that "These foods seem typical for certain cultures," "I think more kids would bring ethnic foods if there wasn't a stigma attached" and "I think that young children will most likely choose their most comfortable food. But also [it] depends on home and parents-- if they introduce a variety of cultural foods."

Table 1: Pilot data for the face-matching task with the pictures of boys

$\chi^2(18, n = 50) = 246.86, p < 0.001$.

Faces		African-American	E.Asian	S.Asian	White - American	Latinx	All
Food type	American	**2**	0	6	**24**	4	14
	Chinese	0	**37**	3	2	6	2
	Mexican	2	1	7	5	**31**	4
	Indian	5	2	**32**	3	5	3

Table 2. Pilot data for the face-matching task with the pictures of girls

$\chi^2(18, n = 50) = 116.522, p < 0.001$.

Faces		African-American	E.Asian	S.Asian	White American	Latinx	All	Don't know
Food type	American	**2**	2	5	**19**	9	11	1
	Chinese	3	**27**	3	0	11	6	0
	Mexican	0	2	11	5	**23**	9	0
	Indian	2	4	**21**	10	8	3	2

Table 3: Pilot data for the face-matching task collapsed across gender

$\chi^2(18, n = 50) = 337.395, p < 0.001$.

Faces		African-American	E.Asian	S.Asian	White-American	Latinx	All	Don't know
Food type	American	**4**	2	11	**43**	13	25	1
	Chinese	3	**64**	6	2	17	8	0
	Mexican	2	3	18	10	**54**	13	0
	Indian	7	6	**53**	13	13	6	2

APPENDIX E: PARTICIPANT DEMOGRAPHICS

Table 4: Child racial and ethnic distribution

	Frequency	Percent
Hispanic or Latino, Caucasian or White	8	9.88%
Not Hispanic or Latino, Caucasian or White	38	46.91%
Not Hispanic or Latino, African-American	8	9.9 %
Not Hispanic or Latino, Asian	21	25.9%
Not Hispanic or Latino , Two or more races	3	3.7%
Prefer not to respond/no response	3	3.7%

Table 5: GTCC Adult racial distribution

	Frequency	Percent
African- American	40	26.5%
American Indian or Alaskan Native	1	.7%
Asian	12	7.9%
Native Hawaiian or Pacific Islander	1	.7%
Caucasian or White	64	42.4%
Two or more races	7	4.6%
Prefer not to respond	26	17.2%

Table 6: GTCC Adult ethnic distribution

	Frequency	Percent
Hispanic or Latino	17	11.3%
Not Hispanic or Latino	118	78.1%
Prefer not to respond	10	6.6%
Missing	6	4.0%

APPENDIX F: PARENT QUESTIONNAIRE

Table 7: Parents' mean ratings on the parent questionnaire

	Mean	SD
How often does your child pack his/her own lunchbox?	1.17	1.4
How often does your child take food from your culture to school?	1.96	1.39
How often does your child take food from different cultures to school?	1.27	1.18
How important is it for your child to eat food from your culture?	2.26	1.29

APPENDIX G: CHILDREN'S PERFORMANCE ON THE TASKS

Table 8*:* Frequencies of children's responses on the face-to-food matching task

Faces		African American	East Asian	South Asian	White American	Latinx	All of them	Don't know
Food type	American	**9**	6	9	**48**	7	0	2
	Chinese	6	**46**	10	3	12	1	3
	Mexican	14	9	24	10	**22**	0	2
	Indian	7	8	**42**	6	17	0	1

Figure 1*:* Children's frequencies on the face-to-food matching task

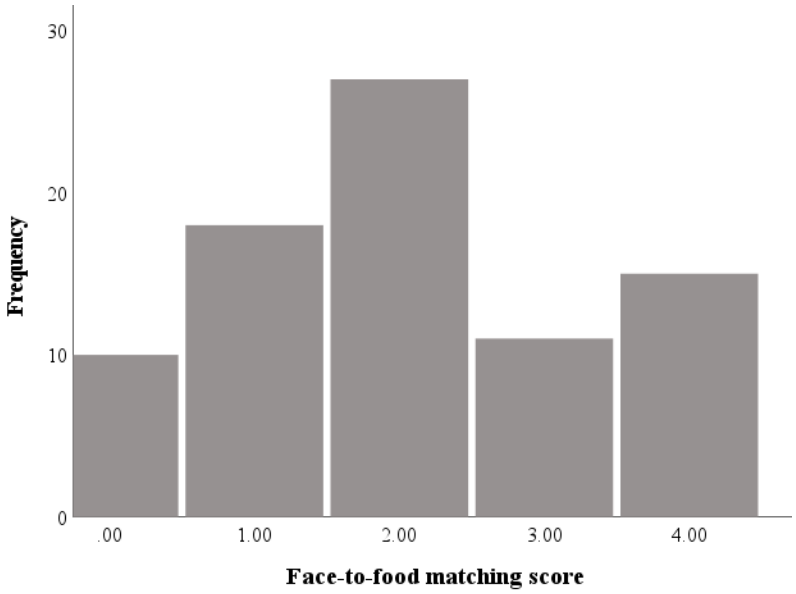

Table 9: Children's face-to-food matching score

	Estimate	S.E	z value	p-value
(Intercept)	-0.040	0.363	-0.110	0.912
Age	0.072	0.036	2.023	0.043*
Foods from different cultures	0.062	0.068	0.924	0.356

Table 10: Children's stereotype-consistent match per trial

	Estimate	S.E	z value	p-value
(Intercept)	-0.849	0.569	-1.491	0.136
Food type (compared to American)				
Indian lunchbox	-0.782	0.339	-2.306	0.021*
Chinese lunchbox	-0.569	0.340	-1.674	0.094
Mexican lunchbox	-1.849	0.359	-5.156	0.000***
Age	0.164	0.055	2.967	0.003**
Foods from different cultures	0.168	0.103	1.637	0.102

Table 11: Children's stereotype-consistent match for the first food

	Estimate	S.E	z value	p-value
Intercept	-1.595	1.143	-1.396	0.163
Food type (compared to American)				
Chinese lunchbox	0.195	0.616	0.317	0.751
Indian lunchbox	0.495	0.692	0.715	0.475
Mexican lunchbox	-2.023	0.798	-2.535	0.011*
Age	0.167	0.117	1.427	0.153
Foods from different cultures	0.267	0.214	1.243	0.214

Table 12: Children's mean (SD) evaluations of lunchbox foods by question type

	Smell	Taste	Okay	Cool	Messy	Average
American	3.08(.99)	3.37(1.03)	3.55(.84)	2.34(.83)	2.81(1.07)	3.03(.61)
Chinese	2.8(1.16)	2.7(1.37)	3.36(1.17)	1.78(.99)	1.77(1.19)	2.48(.8)
Mexican	2.78(1.14)	2.68(1.17)	3.4(1.04)	1.94(.85)	1.49(1.24)	2.46(.68)
Indian	2.91(1.12)	2.79(1.2)	3.37(1.02)	1.66(.92)	1.58(1.02)	2.47(.74)

Figure 2: Children's mean evaluations of lunchbox foods by question type

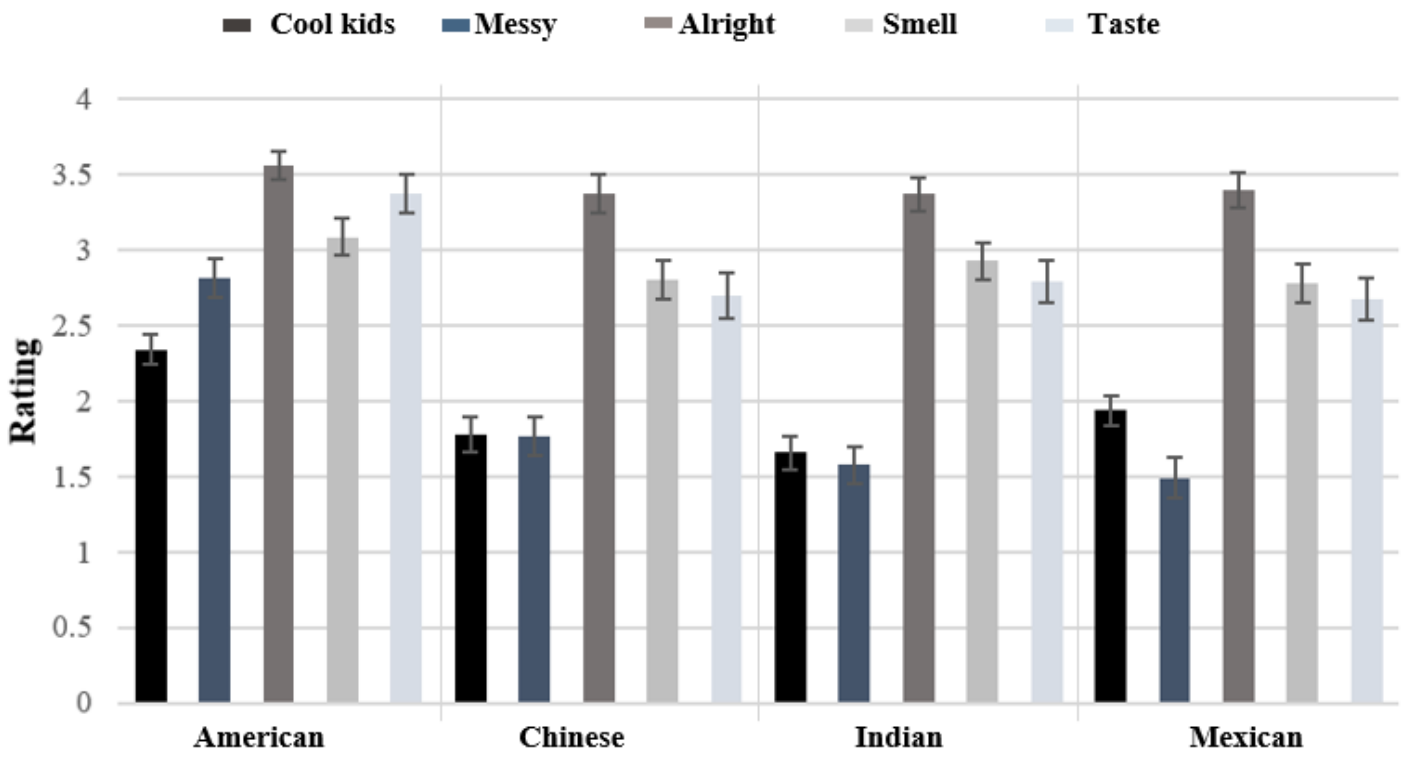

Table 13: Children's ratings of lunchbox foods by question type

	Estimate	S.E	z value	p-value
Age	0.079	0.052	1.518	0.129
Food type effects (compared to American)				
Chinese lunchbox	-1.447	0.333	-4.343	0.0***
Indian lunchbox	-1.347	0.326	-4.129	0.0***
Mexican lunchbox	-1.529	0.324	-4.726	0.0***
Question type effects (compared to taste)				
Cool kids	-2.175	0.316	-6.878	0.0***
Messy	-1.362	0.323	-4.218	0.0***
Alright to bring to school	0.612	0.368	1.665	0.096
Smell	-0.781	0.328	-2.381	0.017*
Foods from different cultures	0.101	0.105	0.966	0.334
Food x question interaction				
Chinese lunchbox x cool kids	0.432	0.435	0.991	0.322
Indian lunchbox x cool kids	0.206	0.430	0.478	0.633
Mexican lunchbox x cool kids	0.919	0.426	2.159	0.031*
Chinese lunchbox x messy	-0.474	0.449	-1.057	0.290
Indian lunchbox x messy	-0.883	0.438	-2.014	0.044*
Mexican lunchbox x messy	-0.957	0.442	-2.166	0.030*
Chinese lunchbox x alright to bring	1.126	0.506	2.227	0.026*
Indian lunchbox x alright to bring	0.714	0.488	1.463	0.143
Mexican lunchbox x alright to bring	1.112	0.491	2.263	0.024*
Chinese lunchbox x smell	0.864	0.450	1.921	0.055
Indian lunchbox x smell	1.010	0.445	2.270	0.023*
Mexican lunchbox x smell	0.959	0.441	2.177	0.030*

APPENDIX H: ADULT'S PERFORMANCE ON THE TASKS

Table 14: Frequencies of adult's responses on the face-to-food matching task

Faces		African-American	East Asian	South Asian	White American	Latinx	All	Don't know
Food type	American	**24**	3	2	**85**	4	24	7
	Chinese	1	**128**	3	2	7	7	3
	Mexican	3	2	33	3	**89**	9	10
	Indian	2	10	**96**	5	12	10	15

Figure 3: Adult's frequencies on the face-to-food matching task

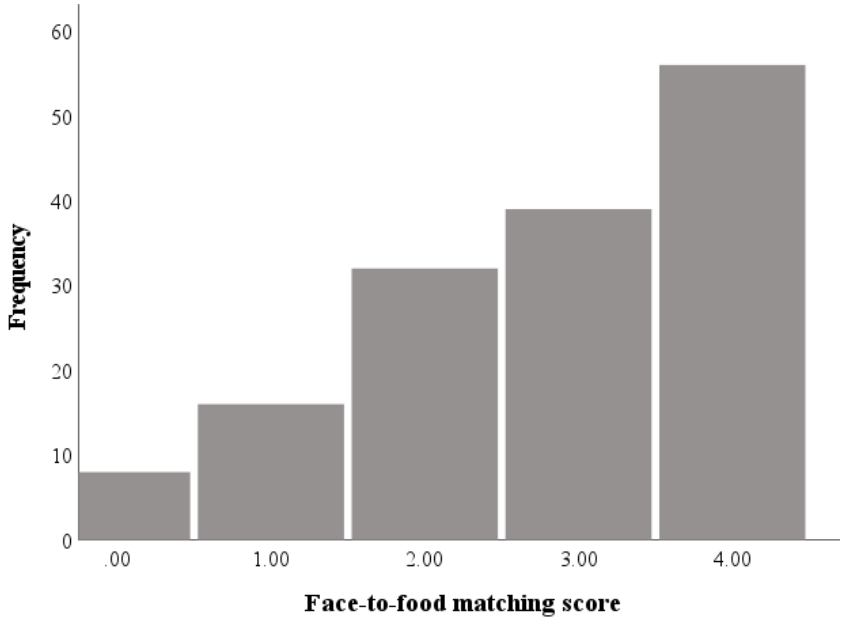

Table 15: Adult's face-to-food matching score

	Estimate	S.E	z value	p-value
(Intercept)	0.998	0.236	4.222	0.00***
Age	0.007	0.007	1.012	0.311
AEBQ Score	-0.052	0.058	-0.907	0.364

Table 16: Adult's stereotype-consistent match per trial

	Estimate	S.E	z value	p-value
(Intercept)	0.752	0.500	1.503	0.133
Food type (compared to American)				
Mexican lunchbox	-0.551	0.257	-2.146	0.032*
Indian lunchbox	-0.367	0.259	-1.415	0.157
Chinese lunchbox	0.789	0.304	2.598	0.009**
Age	0.027	0.014	1.912	0.056
AEBQ Score	-0.178	0.107	-1.659	0.097

Table 17: Adult's stereotype-consistent match on the first trial

	Estimate	S.E	z value	p-value
(Intercept)	2.226	0.975	2.282	0.023*
Food type (compared to American)				
Chinese lunchbox	1.650	0.641	2.573	0.010*
Indian lunchbox	-0.151	0.520	-0.291	0.771
Mexican lunchbox	-0.311	0.494	-0.629	0.529
Age	-0.013	0.026	-0.509	0.611
AEBQ Score	-0.549	0.224	-2.456	0.014*

Table 18: Adult's mean (SD) evaluations of lunchbox foods by question type

	Smell	Taste	Familiar	Okay	Cool	Messy	Disgust	Average
American	2.6(.97)	2.59 (1.14)	3.18(1.33)	2.07(1.78)	2.0(1.16)	3.09(1.16)	2.17(1.66)	2.56(.73)
Chinese	3.37(.88)	3.43(.90)	2.84(1.44)	2.84(1.42)	1.81(1.16)	2.11(1.32)	3.46(.91)	2.84(.65)
Mexican	3.12(.95)	3.13(1.03)	2.28(1.51)	3.6(.88)	1.91(1.06)	1.56(1.15)	3.51(.97)	2.77(.67)
Indian	2.55(1.16)	2.61(1.22)	.99(1.36)	3.39(1.14)	1.32 (1.12)	1.65(1.2)	3.21(1.25)	2.18(.86)

Figure 4: Adult's mean evaluations of lunchbox foods by question type

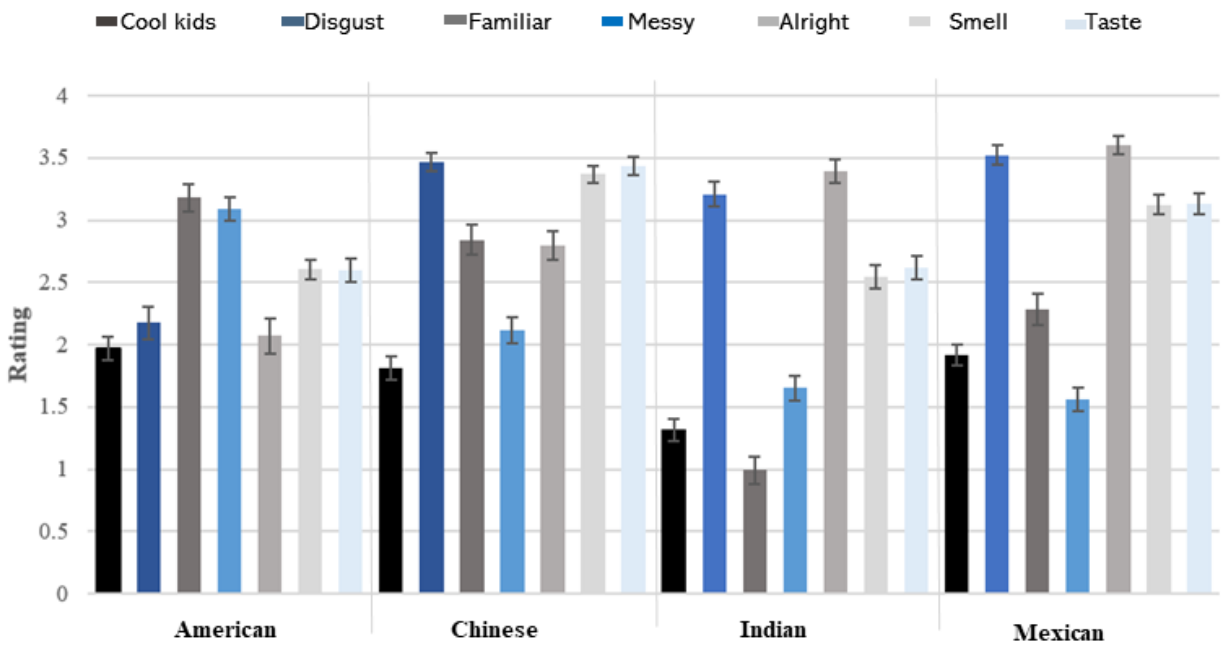

Table 19: Adult's ratings of lunchbox foods by question type

	Estimate	S.E	z value	p-value
Age	-0.006	0.008	-0.707	0.479
Food type effects (compared to American)				
Chinese lunchbox	1.547	0.231	6.713	0.000***
Indian lunchbox	0.044	0.216	0.205	0.837
Mexican lunchbox	0.867	0.216	4.012	0.000***
Question type effects (compared to taste)				
Cool Kids	-0.823	0.226	-3.642	0.000***
Disgust	-0.457	0.229	-1.991	0.046*
Familiarity	1.297	0.236	5.504	0.000***
Messy	0.923	0.223	4.145	0.000***
Alright to bring to school	-0.587	0.237	-2.478	0.013*
Smell	-0.048	0.210	-0.227	0.820
AEBQ score	-0.324	0.071	-4.546	0.000***
Food x question interaction				
Chinese lunchbox x cool kids	-1.740	0.331	-5.259	0.000***
Indian lunchbox x cool kids	-0.926	0.332	-2.791	0.005**
Mexican lunchbox x cool kids	-0.941	0.321	-2.933	0.003**
Chinese lunchbox x disgust	0.579	0.347	1.668	0.095
Indian lunchbox x disgust	1.698	0.337	5.046	0.000***
Mexican lunchbox x disgust	1.551	0.341	4.554	0.000***
Chinese lunchbox x familiarity	-2.218	0.339	-6.537	0.000***
Indian lunchbox x familiarity	-3.821	0.335	-11.400	0.000***
Mexican lunchbox x familiarity	-2.497	0.327	-7.646	0.000***
Chinese lunchbox x messy	-3.147	0.325	-9.681	0.000***
Indian lunchbox x messy	-2.258	0.312	-7.233	0.000***
Mexican lunchbox x messy	-3.142	0.312	-10.082	0.000***
Chinese lunchbox x alright to bring	-0.459	0.337	-1.361	0.174

Indian lunchbox x alright to bring	2.203	0.345	6.383	0.000***
Mexican lunchbox x alright to bring	1.871	0.350	5.345	0.000***
Chinese lunchbox x smell	-0.187	0.322	-0.581	0.561
Indian lunchbox x smell	-0.079	0.304	-0.261	0.794
Mexican lunchbox x smell	0.001	0.305	0.002	0.999

APPENDIX I: ANALYSIS WITH NEIGHBORHOOD DIVERSITY

Table 20: Children's face-to-food matching score

	Estimate	S.E	z value	p-value
Intercept	0.049	0.393	0.125	0.901
Age	0.058	0.038	1.537	0.124
Foods from different cultures	0.051	0.073	0.707	0.480
Outgroup composite	0.052	0.241	0.215	0.830

Table 21: Children's stereotype-consistent match per trial

	Estimate	S.E	z value	p-value
(Intercept)	-0.598	0.605	-0.988	0.323
Food type (compared to American)				
Indian lunchbox	-0.800	0.343	-2.332	0.020*
Chinese lunchbox	-0.525	0.344	-1.527	0.127
Mexican lunchbox	-1.808	0.365	-4.952	0.000***
Age	0.126	0.057	2.226	0.026*
Foods from different cultures	0.143	0.109	1.313	0.189
Outgroup composite	0.075	0.365	0.207	0.836

Table 22: Children's ratings of lunchbox foods by question type

	Estimate	S.E	z value	p-value
Age	0.092	0.055	1.665	0.096
Food type effects (compared to American)				
Chinese lunchbox	-1.485	0.345	-4.298	0.00***
Indian lunchbox	-1.527	0.337	-4.535	0.00***
Mexican lunchbox	-1.692	0.333	-5.080	0.00***
Question type effects (compared to taste)				
Cool kids	-2.337	0.327	-7.147	0.00***
Messy	-1.390	0.334	-4.156	0.00***
Alright to bring to school	0.664	0.384	1.732	0.083
Smell	-0.756	0.341	-2.216	0.027*
Foods from different cultures	0.048	0.109	0.438	0.661
Outgroup composite	0.590	0.363	1.628	0.104
Food x question interaction				
Chinese lunchbox x cool kids	0.521	0.448	1.164	0.245
Indian lunchbox x cool kids	0.485	0.440	1.101	0.271
Mexican lunchbox x cool kids	1.112	0.436	2.551	0.011*
Chinese lunchbox x messy	-0.398	0.462	-0.862	0.389
Indian lunchbox x messy	-0.727	0.449	-1.618	0.106
Mexican lunchbox x messy	-0.775	0.451	-1.717	0.086
Chinese lunchbox x alright to bring	1.111	0.526	2.112	0.035*
Indian lunchbox x alright to bring	0.721	0.505	1.428	0.153
Mexican lunchbox x alright to bring	1.110	0.508	2.187	0.029*
Chinese lunchbox x smell	0.759	0.467	1.626	0.104
Indian lunchbox x smell	0.970	0.460	2.109	0.035*
Mexican lunchbox x smell	0.897	0.454	1.978	0.048*

Table 23: Adult's face-to-food matching score

	Estimate	S.E	z value	p-value
(Intercept)	0.873	0.279	3.127	0.002
Age	0.006	0.007	0.911	0.362
AEBQ Score	-0.065	0.062	-1.040	0.298
Racial outgroup	0.320	0.203	1.578	0.115

Table 24: Adult's stereotype-consistent match per trial

	Estimate	S.E	z value	p-value
(Intercept)	0.39413	0.57731	0.683	0.49479
Food type (compared to American)				
Mexican lunchbox	-0.6143	0.27994	-2.194	0.028*
Indian lunchbox	-0.4707	0.28185	-1.67	0.09491
Chinese lunchbox	0.78227	0.33097	2.364	0.018*
Age	0.02491	0.01453	1.715	0.08641
AEBQ Score	-0.2437	0.11947	-2.04	0.041*
Racial outgroup	1.24893	0.40928	3.052	0.002**

Table 25: Adult's ratings of lunchbox foods by question type

	Estimate	S.E	z value	p-value	
Age	-0.006	0.009	-0.641	0.522	
Food type effects (compared to American)					
Chinese lunchbox	1.515	0.245	6.191	0.000	***
Indian lunchbox	0.017	0.231	0.074	0.941	
Mexican lunchbox	0.882	0.233	3.783	0.000	***
Question type effects (compared to taste)					
Cool Kids	-0.694	0.240	-2.893	0.004	**
Disgust	-0.513	0.246	-2.083	0.037	*
Familiarity	1.394	0.254	5.485	0.000	***

Messy	1.145	0.242	4.727	0.000	***
Alright to bring to school	-0.685	0.255	-2.686	0.007	**
Smell	0.044	0.226	0.193	0.847	
AEBQ score	-0.292	0.077	-3.794	0.000	***
Racial outgroup	0.312	0.254	1.229	0.219	
Food x question interaction					
Chinese lunchbox x cool kids	-1.817	0.349	-5.198	0.000	***
Indian lunchbox x cool kids	-1.003	0.350	-2.866	0.004	**
Mexican lunchbox x cool kids	-1.073	0.340	-3.157	0.002	**
Chinese lunchbox x disgust	0.529	0.366	1.446	0.148	
Indian lunchbox x disgust	1.763	0.360	4.898	0.000	***
Mexican lunchbox x disgust	1.652	0.367	4.506	0.000	***
Chinese lunchbox x familiarity	-2.190	0.362	-6.050	0.000	***
Indian lunchbox x familiarity	-3.821	0.358	-10.661	0.000	***
Mexican lunchbox x familiarity	-2.578	0.351	-7.348	0.000	***
Chinese lunchbox x messy	-3.263	0.348	-9.371	0.000	***
Indian lunchbox x messy	-2.424	0.336	-7.207	0.000	***
Mexican lunchbox x messy	-3.403	0.338	-10.073	0.000	***
Chinese lunchbox x alright to bring	-0.341	0.360	-0.946	0.344	
Indian lunchbox x alright to bring	2.295	0.369	6.216	0.000	***
Mexican lunchbox x alright to bring	2.004	0.376	5.327	0.000	***
Chinese lunchbox x smell	-0.259	0.342	-0.756	0.450	
Indian lunchbox x smell	-0.215	0.325	-0.661	0.508	
Mexican lunchbox x smell	-0.110	0.328	-0.337	0.736	