Children’s food cognition: Introduction to the special issue

Decision-making within the domain of food is an essential everyday task from deciding what objects in the environment are edible to deciding which foods are the most nutritious, or which foods to eat in particular contexts of consumption (e.g. breakfast). Although food-related decision-making is a dynamic and complex process that is potentially influenced by a variety of factors, including social and environmental (e.g., Birch, Fisher, & Grimm-Thomas, 1999; Rozin, 1996; Shuts, Kinzler, & DeJesus, 2013), there is a growing body of developmental research that acknowledges the importance of investigating cognition as a way to further understand food related decision-making in children (e.g., Nguyen, Girgis, & Robinson, 2015; Rioux, Leglaye, & Lafrairie, 2018). Such an understanding of the cognitive mechanisms underlying decision-making within the domain of food is crucial to face the astounding prevalence of childhood obesity (Centers for Disease Control & Prevention, 2020a; Ogden et al., 2016) and unintentional poisoning risk (Centers for Disease Control & Prevention, 2020b; Schwebel et al., 2017). Indeed, the results of evidence-based programs capitalizing on children’s cognitive development to facilitate children’s conceptualization of health and to boost dietary variety in children are promising (e.g., Griphover & Markman, 2013; Nguyen, McCullough, & Noble, 2011) and call for further research on cognitive development in the food domain.

This special issue is devoted to presenting new findings regarding the role of cognition in children’s food-related decision-making. This special issue brings together a collection of 15 papers that were carefully selected to provide a sampling of studies that address a variety of cognitive processes involved in children’s decision-making within the domain of food, including food attitudes, beliefs, and misconceptions (Bian & Markman, 2020; DeJesus, Gelman, & Lumeng, 2020; Menendez, Jiang, Edwards, Rosengren, & Alibali, 2020; Rigney & Callanan, 2020; Shtulman, Share, Silber-Marker, & Landrum, 2020), conceptual knowledge and categorization (Girgis & Nguyen, 2020; Nguyen, 2020), reasoning (Lafrairie et al., 2020; Raman, Marchak, & Gelman, 2020; Thibaut, Lafrairie, & Foinant, 2020), future oriented thinking and executive function (Ahl & Dunham, 2020; Beck, Eales, & Carlson, 2020; Mahy, Masson, Krause, & Mazachowski, 2020), and social learning (Kim, Cheon, & Chen, 2020; Wlodarczyk, Rioux, & Wertz, 2020). Together, these papers highlight the vast influence of cognition on children’s food-related decision-making. Here, we offer a brief overview of the contributions to this special issue as well as some reflections on the implications that this body of research has for children’s health and education.

1. Food attitudes, beliefs, and misconceptions

The special issue begins with a set of five papers that explore children’s food attitudes, beliefs, and misconceptions. First, DeJesus et al. (2020) used an innovative method, a food version of The Implicit Associations Test (IAT), to measure 4- to 12-year-olds’ food cognition. These researchers unexpectedly found that children display positive implicit associations towards vegetables. They also found a positive association between the accuracy of children’s assessments of food healthfulness and children’s food IAT d-scores such that the more accurate children are in their assessments, the stronger the vegetable-happy association. Second, Bian and Markman (2020) investigated 4- and 5-year-olds’ conceptions and misconceptions about what breakfast foods should be in the United States and China. The results revealed that children in the United States are characterized by a more rigid representation of breakfast foods compared to children in China. Indeed, only the latter believe that typical and atypical breakfast foods are equally appropriate for morning consumption, and are willing to eat healthy lunch and dinner foods for breakfast.

A challenge for a cognitive scientist investigating food cognition in children is to explain the high variability in children’s food attitudes and beliefs. One important source of variability in children’s food attitudes and beliefs lies in the cultural factors addressed by Bian and Markman (2020). The three following papers investigated parental influences as another major factor shaping children’s food
attitudes and beliefs. For example, Shtulman et al. (2020) examined lay conceptions of GMOs, genetically modified organisms, and other controversial food dimensions (e.g. organic, gluten) among 3- to 10-year-old children and their parents. Results obtained suggest that parents’ ability to define these controversial food dimensions predict their children’s ability to define them as well. In a nutshell, children’s knowledge of these terms varied with their parents’ knowledge, but does not seem to be impacted by their parents’ preferences, moral evaluations (e.g. “Frankenstein-food”), or health-related concerns (e.g. “not good for the body”). Additionally, Menendez et al. (2020) investigated how parents make decisions about the healthfulness of foods for their children between the ages of 4- and 12 years. These researchers discovered that parents tend to use their prior knowledge, as opposed to nutrition labels to inform their food judgements, and that parents view their beliefs about nutrition as influential in their children’s beliefs. Parents also report having conversations with their children about nutrition, and believe that they are the best source of information for their children on this topic. Finally, Rigney and Callanan (2020) explored 5- and 7-year-old children’s beliefs about parental authority within the context of food-related decision-making scenarios (healthy versus unhealthy). Overall, the results suggest that children judged most child food choices as under parental authority. Both mothers and children tend to believe that parents are the ones who make decisions about eating healthy foods. However, both mothers and children hold the belief that children should be the decision-maker if they would like to eat healthy foods, but their parents are offering unhealthy foods over healthy ones.

2. Conceptual knowledge and categorization

The special issue continues with two papers that focus on conceptual knowledge and categorization as a cognitive process fundamental to decision-making within the domain of food. These papers investigate different bases upon which children may categorize foods compared to other domain items (e.g. artifacts, natural kinds). In that sense, these studies tackle the question of whether food categorization is domain-specific. In other words, is there a specific set of rules or constraints on categorization of foods compared to different types of entities?

Nguyen (2020) compared 3- to 8-year-old children’s ability and tendency to use evaluative category representations of food and nonfoods and revealed domain similarities in children’s evaluative category representations of foods, animals, artifacts, people, and plants as well as domain differences in children’s tendency to use evaluative versus taxonomic categorization for foods and artifacts. Girgis and Nguyen (2020) focused on younger and older preschoolers’ knowledge of the origins of foods, particularly the categories of natural and human-made foods compared to nonfood natural kinds and artifacts. These researchers found that although older preschoolers are more accurate than younger preschoolers at identifying the origins of members from each of these categories, both groups of children are more accurate at identifying the origins of nonfoods than foods, suggesting some dissimilarity in knowledge between these two domains.

3. Reasoning

Related to categorization, conceptual knowledge about food also underpins different types of reasoning processes (e.g., induction, causal reasoning, vitalistic reasoning) that are essential to food-related decisions. Three papers in this special issue focus on different aspects of children’s reasoning, including category based inductive reasoning and reasoning about the consequences of eating. First, Laflaire et al. (2020) investigated the development of domain-specific inductive reasoning strategies for foods, natural kinds, and artifacts in 4- to 7-year-old children. Results revealed that older children (6- to 7-year-olds) exhibited highly specific inductive reasoning strategies within the tested domains of knowledge, while younger children (4- to 5-year-olds) made fewer principled distinctions among them. Additionally, results revealed a marginal influence of the degree of processing of food on older children’s induction strategies, which is consistent with the intriguing ambiguity of food with respect to the natural kind-artifact distinction.

Two additional papers by Raman et al. (2020) and Thibaut et al. (2020) examined children’s reasoning about the effects of food on the human body. First, Raman et al. (2020) examined 3- to 5-year-old children’s and adults’ understanding of the consequences of food compared to physical activities on body size. These researchers documented that with age, individuals gain a differentiated understanding of how food and physical activities influence body size with respect to height and weight. Second, adding a duration component, Thibaut et al. (2020) examined children’s conceptions of time-based causes and effects of food consumption. These researchers demonstrated a developmental progression between the ages of 6 and 10 years in children’s increasing differentiation between short- and long-term causes and effects of food intake.

4. Future oriented thinking and executive function

Next in the special issue are three papers that address the importance of future oriented thinking and executive function in children’s food cognition. First, Mahy et al. (2020) investigated how children’s current thirst affects the ability to forecast their future desires for food versus water by demonstrating that a highly motivating food (versus imagining one’s future states) helps 3- to 5-year-olds overcome the influence of thirst when reasoning about their current and future food preferences in an induced-state episodic foresight task. Second, Ahl and Dunham (2020) explored children’s mentalizing predictions of others’ preferences. These researchers investigated children’s variety seeking predictions regarding an agent with diverse food tastes. Notably, these researchers found that 5- and 6-year-olds, but not 3- and 4-year-olds, expected this agent to seek and prefer variety over homogeneity in foods, including foods the children themselves like and dislike. The third paper by Beck et al. (2020) investigated the relationship between 4- to 5-year-old children’s self-regulation, body mass index, and executive function. These researchers found that children’s body mass index is related to performance on behavioral assessments of hot, but not cool executive function tasks. In particular, the results showed that children
who are overweight or obese assign more value to the size of food rewards when making food choices for themselves compared to children who are of healthy weight.

5. Social learning

To conclude the special issue, two papers speak to the valuable role of social learning in children’s food cognition, each emphasizing different kinds of input that children receive from other people, including peers and adults. First, Kim et al. (2020) highlighted how peer modeling is a critical learning mechanism for children’s food cognition. These researchers tested the extent to which peer taste preferences affect 3- to 6-year-old children’s drinking behaviors. The results showed that children are quite sensitive to remote peers’ beverage taste preferences, and that both children’s preferences and subsequent consumption behavior tend to show conformity, especially with age. Second, Wlodarczyk et al. (2020) examined how social information offered by adults influences plant avoidance in 8- to 18-month-old infants. They discovered that infants modify their plant avoidance behaviors after observing an adult display pain or delight in response to touching a plant. These findings provide new insights into early food learning mechanisms and plant avoidance in infants, understood as a potential precursor of food neophobia occurring at preschool age.

6. Implications and conclusion

All of the papers in the special issue discuss implications of their work for increasing children’s healthy food-related decision-making. A number of the papers discuss how evidence-based food education programs can be informed by children’s conceptual knowledge and reasoning within the domain of food (e.g., Girgis & Nguyen, 2020; Lafraire et al., 2020; Nguyen, 2020; Raman et al., 2020; Thibaut et al., 2020). Evidence-based food education in this sense includes nutrition lessons that capitalize on children’s naive theory of biology, but will have also to address the rigidity of children’s cultural food categories.

Bian and Markman (2020) and DeJesus et al. (2020) encourage us to take a closer look at children’s food environments and the kinds of messages children receive at home about healthy foods. Indeed, several papers in this special issue offer insights into how parents serve as a key source of food and nutrition-related input for children (Menendez et al., 2020; Rigney & Callanan, 2020; Shtulman et al., 2020).

In addition, two papers discuss the implications of social learning for children’s food consumption. Wlodarczyk et al. (2020) suggest that familiarity and social information paired with plant-based foods may be instrumental in minimizing food neophobia. Kim et al. (2020) also suggest that behavioral changes in children’s healthy beverage selection and consumption may be possible within the context of social influence interventions with remote peers.

Finally, three papers also draw attention to characteristics of foods and individual variables that are relevant in the encouragement of children’s healthy eating behaviors (e.g., size of food reward, children’s weight, Beck et al., 2020; hedonic value of food variety, children’s age, Ahl & Dunham, 2020; food novelty and appeal, children’s motivation, Mahy et al., 2020).

In conclusion, it is our aspiration that the papers presented in this special issue increase our understanding of the cognitive processes that influence children’s food-related decision-making. Furthermore, it is our conviction that this special issue will reveal that food cognition in children is not a marginal topic anymore, but a blossoming research area animated by scientists deeply committed to children’s healthy eating.

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References


Simone P. Nguyen*

Department of Psychology, University of North Carolina Wilmington, 601 South College Road, Wilmington, NC, 28403-5612, USA

Jérémie Lafraire

Institute Paul Bocuse Research Center, France

* Corresponding author.

E-mail address: nguyens@uncw.edu (S.P. Nguyen).