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Research report

Children's use of adult testimony to guide food selection

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ABSTRACT

We hypothesized that children's reliance on adults' testimony regarding food choices would diminish when adults were shown to be unreliable informants by expressing liking for foods the children disliked. In three studies, 3–6-year-old children observed an adult expressing liking for food and non-food items that were either the same as or opposite the child's stated hedonic assessments. Even after having observed an adult express liking for stimuli the children disliked, children still selected the item which the adult identified as hedonically positive. Children were more likely to select the stimulus identified as hedonically positive by the adult when the stimulus was food (as opposed to non-food), and when the adult's hedonic assessment was provided as an absolute ("I think this is yummy.") as opposed to a comparative statement ("I like this one better."). The results imply that an adult's identification of a food as hedonically positive serves as an important guide to children's food selection, even when children recognize that adults have very different hedonic assessments of foods from themselves. Providing information to children that a food is palatable in absolute terms also appears to shape children's food selection more powerfully than providing the information in comparative terms.

Transmission of knowledge within a culture relies in large part on the willingness to accept testimony from another person, even when the basis for the testimony is unclear. Domains of knowledge which classically require the acceptance of others' testimony as opposed to first hand observation include religion, history, and science (e.g., "George Washington was the first president," or "The earth is round.") (Harris & Koenig, 2006). Another domain of knowledge in which children may be particularly apt to trust the information provided by others is food. As omnivores, humans are faced with the dilemma of selecting a variety of foods from the environment, while avoiding the ingestion of something poisonous (Rozin, 1976). Knowledge about which substances are edible, safe, and palatable is in large part culturally transmitted via accepting information provided by knowledgeable others. A primary question is therefore whether food, as opposed to non-food items, represents a privileged domain in which children are particularly apt to accept the report of others as truth and use it to guide their choices.

Information provided by others, however, is not always reliable. People are often motivated to provide false information, and the ability to accurately discriminate reliable from unreliable information is advantageous. A second central question therefore regards how willing children are to accept testimony when it directly conflicts with their own personal experience. Children recognize that adults are generally more knowledgeable than themselves and rely on information provided by adults to guide their behavior in ambiguous or unfamiliar situations (Taylor, Cartwright, & Bowden, 1991). However, by age 3 years children recognize that adult testimony is not always reliable, in that it may diverge from their own perceptions (Clement, Koenig, & Harris, 2004; Koenig & Harris, 2005). By age 4 years, children are less likely to use information provided by an unreliable adult (compared to a reliable adult) in making a choice about something which they themselves have not yet seen or experienced (Koenig & Harris, 2005).

The parent–child feeding relationship is perhaps one of the clearest examples of the intentional provision of false testimony to children to shape behavior. Parents frequently tell children that foods are palatable when in fact they are not (e.g., "This spinach is yummy!") with the laudable goal of encouraging the child's consumption of nutritious foods. By age 18 months, children recognize that an adult may like a food (e.g., broccoli) that the child does not (Repacholi & Gopnik, 1997). On this premise, children should theoretically begin to recognize that if adults frequently express liking for foods the children themselves dislike, adults may not always be reliable informants about a food's palatability. Children may therefore be less willing to accept an adult's report that a food is palatable if the adult has proven to be an unreliable

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informant in the past. After years of a mother telling a child, "This vegetable is yummy!", followed by the child sampling and disliking the bitter vegetable, one would anticipate that the child would eventually begin to view the mother as an unreliable informant about food palatability, and stop trusting the information that she provides about food.

If this were true, then one would hypothesize that adults modeling eating specific vegetables would not be a particularly effective method of getting children to eat those vegetables. This would be particularly true in the context of children's developing ability to appreciate that adults can experience different sensations or feelings from themselves (Bretheron & Beeghly, 1982), as well as their developing ability to become skeptical or critical consumers of testimony (Clement et al., 2004). The data, however, indicate that adults modeling eating novel foods is a remarkably effective method of persuading children to eat those foods (Addessi, Galloway, Visalberghi, & Birch, 2005; Harper & Sanders, 1975). It is worth noting that these studies focused on adults eating a food before a child (after which the adult may or may not comment upon it). The question at hand is, regardless of whether the adult eats the food in front of the child, what impact does the adult's testimony about either the food's palatability or their preference for one food over another have on the child's willingness to eat the target food? One study that separated the effects of modeling and testimony provides some evidence on this point: eating a food in front of a child while also proclaiming that it is very palatable is more effective than simply silently eating the food in front of the child (Hendy & Raudenbush, 2000).

The studies presented here therefore sought to address several central questions that will shed light on children's use of adult testimony in guiding food selection, as well as current claims about the efficacy of modeling in shaping eating behavior. The questions these studies sought to address were: (1) *Do children select food based on adult testimony?* This question is unique compared to prior work in that it focuses on adult testimony about food as opposed to modeling eating the food. (2) *Are children skeptical consumers of adult testimony about food?* In other words, when adults have proven to be unreliable informants about food in the past (i.e., "These Brussels sprouts are yummy!"), are children less apt to rely on their testimony about food? (3) *Is children's willingness to accept adults' testimony about food mediated by the language with which that testimony is presented?* Since testimony is delivered, by definition, via language, are variations in the verbal presentation of the testimony predictive of its efficacy? In other words, how sensitive are children to subtle variations in the manner in which testimony is presented? (4) Finally, *Are children less skeptical of adults' testimony about food than they are of adults' testimony about non-food stimuli?* Food has been posited to be a privileged domain in cognitive development (Macario, 1991). Children may be particularly apt to accept without skepticism adults' testimony about food compared to non-food stimuli because the stakes with food are higher: ignoring an adult's testimony that a substance is inedible or poisonous could have dire consequences. Children may therefore be particularly apt to accept adults' recommendations for food.

The present set of experiments first sought to test the hypothesis that children would readily select food based on adult testimony when they observed the adult to have opinions about specific foods' palatability that are congruent with the child's own opinions. The outcome when children observed the adult to have very different opinions about specific foods' palatability from themselves was more difficult to predict. Prior reports that 4-year-old children are able to discriminately use testimony of reliable versus unreliable informants (Clement et al., 2004; Koenig & Harris, 2005) would suggest that children in this age range would recognize the adult informant as unreliable, and therefore, when faced with a choice between two foods, would correctly select the food opposite the food identified as more hedonically positive by the adult. The literature on modeling in eating behavior (Addessi et al., 2005; Harper & Sanders, 1975) would suggest that children would readily follow the adult's lead and simply select the food identified by the adult as more hedonically positive. We sought to evaluate these two competing hypotheses.

We pause here to clarify our use of the terms preference versus liking. As reviewed by others (Rozin & Zellner, 1985), one food may be preferred over another for reasons other than "liking" or "palatability". An adult, when given a choice between two items, may prefer broccoli over French fries because of the superior nutritional content of the broccoli. This does not mean, however, that the adult would assess the broccoli as more "hedonically positive" than the French fries. In the present series of studies, the adult experimenter repeatedly identifies (using a variety of language) one food as "hedonically positive" and the other as "not hedonically positive", or one food as "liked more" than the other. The distinctions between the "hedonically positive" and "not hedonically positive" foods were embellished with congruent facial expressions. Thus, the implication to the child is not that the adult is presenting one food as "preferred" for any reason other than pure palatability. We therefore refrain from using the relatively imprecise term that the child or adult "preferred" one item over another, in favor of the more precise terminology "hedonically positive", which focuses on a response to the stimulus driven purely by hedonics and not, for example, nutritional content.

We focused on the age range 3–6 years for several reasons. First, there is rapid development of children's understanding that an adult may have different hedonic assessments, or mental states, than themselves during this age range (Wellman, Cross, & Watson, 2001), and including children with ages broadly across this window of development would allow exploratory analyses into whether results differed by age. Secondly, there are data to suggest that the preschool years may be a critical period for food preference formation (Skinner, Carruth, Bounds, & Ziegler, 2002), and a better understanding of the developmental underpinnings of behavior in this age range would have important clinical implications.

Overview of methods

Participants

Three- to six-year-old healthy, English-speaking children without a history of food allergies were recruited from the community. Mothers provided basic demographic information and written informed consent. Each of the three studies to be described was conducted with a unique set of participants.

Materials

Twelve jelly beans (Jelly Belly™) (six 'palatable' and six 'unpalatable') were used as stimuli. The six 'palatable' flavors (apricot, berry blue, Dr. Pepper, grape, kiwi, and plum) were identified from 50 commercially available flavors based on ratings in prior work with the same age range involving 166 children, each of whom tasted 20 different jelly bean flavors (Lumeng & Cardinal, 2007; Lumeng, Zuckerman, Cardinal, & Kaciroti, 2005). The six 'unpalatable' flavors (dirt, garlic, mango, sardine, spaghetti, and spinach) were selected from a line of 14 commercially available novelty jelly beans intended to elicit disgust reactions from children (e.g., "vomit-flavored"). Of these 14 jelly beans, 5 were