Research Report

Predicting children's meal preferences: How much do parents know?

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Abstract

We investigate how accurate parents are at predicting their children's meal preferences and what cues best describe parents' predictions. In Study 1, 30 parents predicted their children's school lunch choices from actual school menus. Parents' prediction accuracy matched the stability of children's meal choices (assessed in a 4-month retest), implying that accuracy was as high as can be expected. Parents appeared to make their predictions by using specific knowledge about their child's likes and by projecting their own preferences. In Study 2, we asked 58 parents to predict their children's preferences for 30 randomly drawn school meals, and compared them to the children's actual preferences. Again, parents showed high prediction accuracy and predicted the lunches their children liked correctly more often than the disliked ones. Overall, parents' accuracy in predicting their children's food preferences was as good as or better than found in previous preference prediction studies that used less ecologically relevant task domains.
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Introduction

Children do not intuitively know what foods are good for them (Galef, 1991; Story & Brown, 1987). If they were allowed to choose their food freely they would opt for sweet and salty tastes (Desor, Greene, & Maller, 1975) as well as high-fat foods (Birch, 1992; Mela, 1992). In reality, children typically do not get to choose their food without restrictions (Birch, 1989; Robinson, 2000; Wansink, 2006). To ensure that children actually eat a healthy variety of foods, it is advantageous if parents have knowledge of both what their children like and what is good for them, so that they can find healthy food compromises (as described by Lowenberg, 1948). Sometimes parents will not know for certain if their child likes a particular food when deciding

whether or not to serve it. In these situations, parents need to predict their children's food preferences.

In this article we investigate how accurately parents predict their children's food choices and which prediction cues describe best how they make their predictions. We extend previous research on preference prediction in three ways: First, we consider the little-explored ability of parents to predict preferences of their young children. Second, we investigate the prediction domain of food choice, which is of high daily relevance for the person making a prediction (the so-called "agent") and the person whose preferences are predicted (the "target"). Results from previous prediction studies in less consequential domains may not generalize to this domain. Third, we compare parents' prediction accuracy for their children's lunch likes with that for their dislikes; as we lay out later these skills may play a role for the variety of different foods children get exposed to.

Prediction accuracy

Past research in marketing and social psychology has found that people's general ability to predict others'

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preferences in domains not related to food is often relatively low (Alba & Hutchinson, 2000). Hoch (1987) asked participants to predict the attitudes, interests, and purchase behaviors of their spouses, their peers (married MBA students), and the average American consumer. Preferences and predictions were stated on a Likert scale; predictive accuracy was measured as the correlation between agents' predictions and the stated preferences of the targets. The predictive accuracy for the average American consumer was $r = 0.08$, while peers were predicted with an accuracy of $r = 0.53$, and spouses with $r = 0.51$.

Swann and Gill (1997) found that prediction accuracies of preferences for activities such as room cleaning, going to a bar, or playing board games were slightly higher for couples ($r = 0.57$) than for roommates ($r = 0.44$). In a series of four different experiments, Davis, Hoch, and Ragsdale (1986) found spouses' average accuracy of predicting each other's liking of new product concepts to be around $r = 0.27$. Also, in a series of two experiments West (1996) found that students who did not know each other predicted the other's preference for quilt patterns with an accuracy of about $r = 0.15$ and $r = 0.25$; when they received feedback on the target's quilt pattern preferences over 100 trials, their accuracy improved significantly (up to around $r = 0.50$ and $r = 0.80$). From yet another study, Lerouge and Warlop (2006) concluded that student couples had rather low prediction accuracy when forecasting their partner's bedroom furniture preferences.

Fagerlin, Ditto, Danks, Houts, and Smucker (2001) reported that adult children's forecasts of whether their parents would want life-sustaining medical treatment were between 64% and 72% accurate across scenarios. As there were only two alternatives to choose from, chance level was 50%. Wallin, Fasolo, and McElreath (2007) found that accuracy of predicting what drink a friend would like at a café was 49% (chance level = 14%).

Likes versus dislikes

One aspect of prediction that has received little attention in the literature so far is whether agents are better at predicting targets' dislikes or likes. Parents presumably want to take both their child's likes and dislikes into account when deciding what foods to buy and serve to them. But a given parent may aim for a particular balance in getting the likes versus dislikes right. Some parents may prefer to err on the side of optimism, predicting more often that their child will like a novel food. This will lead the parent to expose her child to more new foods, but will also increase the number of false positives—foods that parents think their child will like but that are actually met with disapproval. Other parents may adopt a conservative strategy, more often predicting their child will dislike a novel food. This may result in fewer rejected meals but will also result in more misses of foods that the child may actually have liked if given the opportunity to try it.

Stability of preferences

Prediction accuracy is also impacted by the stability of preferences over time—specifically, preference prediction accuracy can usually not exceed preference stability. For example, the 2-week retest reliability of preference ratings for new consumer products has been found to be $r_{test-retest} = 0.7$ (Davis et al., 1986). Thus the reliability of preferences can be seen as one benchmark for prediction accuracy (Guilford, 1954). In a number of domains, this stability has been shown to be limited. One could argue that if a predictor was aware of the situational influences that systematically alter the target's preferences over time and thereby diminish preference stability, he could adjust his predictions and achieve even higher accuracy. However, in the food domain there are numerous situational influences (e.g., social influences—Clendenen, Herman, & Polivy, 1994—and environmental factors—Hill, Wyatt, Reed, & Peters, 2003) that would be very difficult to take entirely into account. Therefore preference stability remains an important constraint on prediction accuracy in this domain.

Benchmark criteria for prediction accuracy

To obtain a comparison standard for the accuracy of an agent's predictions of the target's preferences we can compare it to the following benchmark criteria:

Accuracy of agent's predictions when applied to all other targets in a study. This benchmark helps disentangle predictions that were specifically tailored to one target from those that follow from a "psychological chance baseline" (Gage & Cronbach, 1955, p.417) of more stereotypical knowledge about the preferences of the target group in general.

Accuracy of a hypothetical base-rate forecaster. The "hypothetical base-rate forecaster" (Hoch, 1985, p. 724) predicts that every target prefers the option that is most popular among all targets. Thus, predictions are based on aggregate knowledge comparable to that of a marketing department tracking sales of products and do not take individual target differences into account.

Prediction cues

If a person knows exactly what another person likes, this specific knowledge of the other's preference renders strategies or cues for prediction unnecessary. However, when predicting agents are not certain about a target's preferences, they may still have access to a number of cues that are correlated to those preferences (Brunswik, 1955; Hoch, 1988). In familiar domains, such as school lunch preferences in our studies, it is difficult to disentangle agents' use of particular probabilistic cues for making predictions from the use of specific knowledge about the agents' precise preferences. It is not clear whether agents relied on specific knowledge or on a cue to make a

prediction. Nonetheless, from these studies we can still tell whether parents could have made more accurate predictions by relying on particular cues. We consider two possible cues here:

Agent's own preferences: To the degree that the agent perceives himself as similar to the target, he can successfully project his own likes and dislikes onto the target and use them as the basis for making a prediction (Gershoff & Johar, 2006).

Healthfulness: The literature on the role of healthfulness in food choice of children and parents is inconclusive. Some research shows that healthfulness is a very important cue in food choice for everybody (Wardle, Parmenter, & Waller, 2000); while some scholars propose that it is totally insignificant for food decisions (Noble, Corney, Eves, Kipps, & Lumbers, 2000, 2003). Whether or not children use this cue to make their food choices, parents may still use it to make their predictions of their child's preferences.

Estimates of prediction accuracy

It is important for predictors to know how good they are at the prediction task, so that they can decide when they should make a prediction and when they should delay their decision until they have the opportunity to follow some other strategy, such as asking directly for the preference of the target individual. Previous studies (Alba & Hutchinson, 2000; Dunning, Griffin, Milojkovic, & Ross, 1990; Gershoff & Johar, 2006; Swann & Gill, 1997) have shown that adults generally estimate their prediction accuracy to be higher than it actually is. Participants in such studies may judge the quality of their prediction task performance from their typically accurate experience in their natural environment and hence overestimate their accuracy on the more difficult experimental tasks (Gigerenzer, Hoffrage, & Kleinbölting, 1991). We expect participants in our studies to be better at estimating their prediction accuracy because of their familiarity with the food preference task.

Particularities of parents' predictions of children's meal preferences

Given the lack of past prediction studies that have looked at the parent–young children relationship in the food domain, we have to turn to some basic considerations to conjecture about parents' accuracy regarding their children's meal preferences. But these factors do not suggest a common conclusion. First, most parents provide meals for and frequently eat together with their children. This implies that predicting their children's preferences is a very familiar task that parents should be fairly good at. Second, parents control the food intake of their children and provide a large portion of the food environment (foods a child knows or is regularly exposed to—Nicklas et al., 2001). Consequently, children may develop an increased

liking for food to which they have repeated exposure (Birch & Marlin, 1982) but sometimes also for a restricted food (Fisher & Birch, 1999) which complicates parents' prediction task.

A third factor particular to this domain is that children often have different food preferences from adults in general and their parents specifically. Several studies report weak or absent resemblance in food likes between parents and their own children—a phenomenon known as the "family paradox" (Birch, 1980a; Pliner & Pelchat, 1986; Rozin, 1991; Rozin & Vollmecke, 1986). As outlined above, most previous prediction studies looked at adults predicting other, often familiar adults, and the extent to which agents were similar to targets would mean that projecting their own preferences was a reasonable prediction strategy. But given that adults are less similar to children than to other adults generally (Birch, 1999), and given the particular parent–child divergence in food tastes, this strategy is unlikely to work well in the situation we explore. Are parents aware of this problem and do they adapt their prediction cues accordingly?

Research questions

Based on the theory and findings described above, we investigated the following research questions:

1. How accurately do parents predict their children's meal preferences? What cues underlie parents' predictions of their children's meal preferences? Do they project their own preferences? Do they predict meal choices they perceived as most healthful?
2. When predicting their children's meal choices, do parents prefer to have fewer "false alarms" (serving disliked foods) than "misses" (not serving a liked food)?
3. How well do parents estimate their accuracy at predicting their children's meal choices?

Methods

To answer these research questions, we conducted two empirical studies. Study 1 is a field study on actual food choices that children face on a daily basis. While this first study ensured high ecological validity, it restricted experimental control. Therefore, we conducted a second, more controlled study that also allowed assessing additional variables.

Study 1

Design and procedure: Our first study was conducted at a primary school where meal plans for the school lunch canteen were issued bi-weekly. Lunch choices included meals such as "2 fried sausages with paprika sauce, mashed potatoes, and peas" or "spaghetti with tomato sauce." The children take the meal plans home and commonly choose together with their parents which lunch they want to have on each school day for the upcoming 2 weeks. The children

get their daily lunches based on their choices on this meal plan. For the study, we gave children the actual school meal plan (Meal Plan 1) for the upcoming 2 weeks along with a second school meal plan (Meal Plan 2) from a different caterer supplying a number of other local schools. None of the meals were repeated. While they were in class, the children were asked (1) to circle for each day of their school lunch plan the dish that they would choose from the two offered each day; (2) to mark which dish they would choose for each day from the second lunch plan, which had four menu options for each day; and (3) on another copy of the second lunch plan, to circle the dish they thought was healthiest on each day. Children were furthermore asked for their grade, sex, birth date, and whether they usually bought lunch at the school canteen.

The children were then given questionnaires to take home for one parent to fill out. Parents received the same meal plans as their children. For both meal plans they stated which meal they would want for themselves and predicted the lunch they thought their child would choose. For the second meal plan, as did the children, they also marked the daily meal they judged as most healthful. Parents were further asked for the birth date and sex of their child, whether he or she was enrolled in the school lunch program, and how many times per week the parent and child had breakfast and dinner together. Children were asked not to help their parents fill out the questionnaires and instructions told the parents that the study would not work if they did it together with their child. The children then brought the questionnaires back to school and gave them to their teachers for delivery to the authors via mail.

The principal of the school had informed parents, students, and teachers about the study in advance. Agreement to participate was obtained from everyone who took part in the study. The meeting with the children took place during school lessons and lasted between 30 and 40 min. The experimenters gave instructions to the children, stayed in the classroom throughout the session, and ensured that students did not discuss their meal preferences with each other.

To measure preference stability, children's lunch preferences over the same meal choices were reassessed after 4 months. Due to time constraints only Meal Plan 2 was given to the students on this occasion. Children were again asked to circle which meal they would choose for each day.

Participants: Participants were primary school students from Kleinmachnow (a city close to Berlin, Germany) and one of each child's parents. Out of the 100 students in grades 3–6, 30 agreed to participate. These students were between 8 and 11 years old with a mean age of 10 years, and 18 were male. Of their participating parents, 14 were fathers, 9 were mothers, and 7 did not identify their sex.

Sixteen of the initial 30 students participated in the followup study 4 months later. The others either were not present at school that day or their answers could not be matched with the previous questionnaires.

Study 2

Design and procedure: In our second study, we randomly selected 30 meals out of 6 months' worth of school meal plans for Berlin schools (using menus from the same two caterers as in Study 1). Parents and children who agreed to participate in the study (recruited from a university science event as described below) were separated and seated at tables on opposite sides of a large classroom and received questionnaires containing the 30 meals.

In contrast to Study 1, where participants just chose one lunch at a time out of a 2- or 4-option meal plan, children in Study 2 were asked to indicate the degree to which they liked to eat each of the meals using a 4-category preference scale ("don't like it at all," "don't like it very much," "like it," "like it very much"). This is a more fine-grained measure of preference as, for example, participants in Study 1 might have liked two meals equally well, or disliked all of them but were nonetheless forced to choose one. Asking for a rating of every dish also allowed us to assess parents' prediction accuracy for likes versus dislikes.

Correspondingly, parents in Study 2 also rated how much they themselves liked each meal and predicted how much their child liked the meals based on the 4-categeory preference scale. Parents further stated how often they ate together with their child, how many of their meal choices (0–30) they thought were the same as those of their children (preference similarity), and how many of their children's meal preferences they thought they had predicted correctly. Every participating child received a prize (a children's book or a computer game).

Participants: Participants were visitors at the Freie Universitä of Berlin's "Long Night of Sciences," an open house hosted by local universities and other scientific institutions in Berlin, Germany, where scientists present their research to the general public. Fifty-eight children and one of their parents participated. Children had a mean age of 10.7 years ($SD = 2.9$ years). Of the children, 62% were girls, and of the parents, 70% were mothers.

Analyses of data

Analyses were similar for Studies 1 and 2. To calculate prediction accuracy we assessed for every parent–child dyad how often the parent's prediction matched the child's choice and then averaged percentage of agreement across all pairs. To estimate similarity between parents' and children's preferences and thus whether parents could have improved their predictions by relying on similarity in preferences or perceived healthfulness of meals, we counted how often parents' choices for themselves, and separately their perception of meal healthfulness, matched their children's own preferences.

Results

Results for Studies 1 and 2 are summarized in Tables 1 and 2, respectively.

Missing data

In Study 1, 8% of all answers concerning the school lunch menus were missing (*children*: Meal Plan 1: 10%, Meal Plan 2: 7%; *parents*: Meal Plan 1: 8%, Meal Plan 2: 6%). Missing values were handled by assigning the total number of answers each participant gave as the 100% level, independent of how many answers were missing (i.e., if a child only marked his meal preference for 8 out of the 9 days, and the child's parent predicted these 8 meal choices correctly, prediction accuracy was counted as 100%). Three children did not fill out their preferred lunch choices in Meal Plan 1 and were excluded from the analysis of that plan, and two parents did not predict their children's lunch preferences in Meal Plan 2 and were excluded from the analysis of that plan.

In Study 2, 5% of the answers were missing (9% of the children's answers, and 3% of the parents' answers), because children did not recognize the meal, or parent or child did not fill out a particular item. As in Study 1, percentages of accuracies or matches refer to the percentage of the available data.

Table 1
Accuracy (% correct) of parents and benchmark criteria for predictions of children's meal choices in Study 1

	Meal Plan 1 (2 options; chance level = 50)	Meal Plan 2 (4 options; chance level = 25)
Parents' prediction for own child	73 (19)	46 (22)
Parents' predictions for all other children	65 (11)	36 (7)
Hypothetical base-rate forecaster	70 (28)	50 (18)
Parents' prediction for own child at 4-month retest	–	55 (20)

Note: Mean (*SD*) shown in each applicable cell. Accuracy of prediction of parents and benchmark criteria are all significantly different from chance level at a $p < 0.01$, for both meal plans.

Table 2
Accuracy (% correct) of parents and benchmark criteria for predictions of children's meal choices in Study 2

	Menu list (4-category scale; chance level = 25)
Parents' prediction for own child	52 (14)
Parents' predictions for all other children	36 (3)
Hypothetical base-rate forecaster	45 (13)

Note: Mean (*SD*) shown. Accuracy of prediction of parents and benchmark criteria are all significantly different from chance level at a $p < 0.01$.

Prediction accuracy

In Study 1, for their children's actual two-choice school meal plan (Meal Plan 1), parents predicted on average 73% of their children's meal preferences correctly (chance = 50%). In the unfamiliar four-choice menu from another Berlin school (Meal Plan 2), parents were correct for 46% of the meals on average (chance = 25%).

When prediction accuracies for the two-option menu and the four-option menu are adjusted separately to take the different chance levels[1] into account, making results comparable across the two meal plans, prediction accuracy was on average 46% (Meal Plan 1) and 28% (Meal Plan 2) better than random guessing. Thus, prediction accuracy was higher in the familiar meal plan (Meal Plan 1) than in the unfamiliar one. However, this difference was not statistically significant on an α-level of 0.05 which is assumed throughout all subsequent statistical analyses, $t(24) = -1.79$, $p = 0.09$, *Cohen's d* = 0.35. Finally, how often parents and children ate together was not associated with parents' prediction accuracy (Meal Plan 1: $r = 0.04$, $p = 0.84$; Meal Plan 2: $r = -0.14$, $p = 0.47$).

In Study 2, parents on average predicted 52% of their children's preferences correctly (i.e., predicting their child's exact answer on the 4-category scale). Using the correction formula applied earlier, this is 36% better than chance. As in Study 1, how often parents and children ate together was not related to parents' prediction accuracy ($r = 0.04$, $p = 0.79$).

Estimates of prediction accuracy: Overall, 55% of the parents in Study 2 underestimated their prediction accuracy by on average 24% ($SD = 13\%$), while 43% overestimated it by an average of 28% ($SD = 23\%$), and one parent perfectly estimated her prediction accuracy. These results suggest that people had difficulties estimating their prediction accuracy but were not generally over-confident about their performance.

Comparison with benchmark criteria: We compared parents' prediction accuracy for their own child with how well their predictions matched the meal choices of all other children in the study.[2] In Study 1, for the familiar two-option Meal Plan 1, parents' predictions on average matched 65% of the other children's meal choices, compared to the 73% accuracy for predicting their own child. This difference is statistically significant, $t(24) = 2.50$; $p = 0.02$, $d = 0.50$. In the unfamiliar four-option menus (Meal Plan 2), parents' mean accuracy for other children's choices was 36%, which again is significantly lower than the 46% accuracy for their own children on those menus, $t(27) = 2.31$, $p = 0.03$, $d = 0.44$. This

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[1]Data were corrected for chance level with the following formula: $p = (p' - C)/(1 - C)$, where p is the probability corrected for chance, p' the raw probability, and C the chance level (cf. Fleiss, 1975).

[2]Each parent's meal prediction was compared with the meal choices of all children except their own. The average prediction accuracy over all predicted children was taken as the parent's prediction accuracy for other children.

suggests that at least some of the parents' meal predictions were based on information specific to the relationship between the parents and their own child.

In Study 2, parents' predictions of how much their own child liked a meal matched the preferences of all other children on average 36% of the time on the 4-category scale. This is significantly lower than the 52% prediction accuracy for their own child, $t(57) = 8.7$; $p < 0.01$, $d = 1.0$, indicating again that some aspect of their specific relationship with their child guided parents' predictions.

For Meal Plan 1 in Study 1, prediction accuracy of the hypothetical base-rate forecaster was on average 70%, which is comparable to parents' 73% accuracy, $t(53) = 0.45$, $p = 0.65$, $d = 0.12$. For Meal Plan 2, the hypothetical base-rate forecaster predicted with 50% accuracy, again not different from parents' prediction accuracy of 46%, $t(56) = -0.76$, $p = 0.49$, $d = 0.2$.

In Study 2, the mean prediction accuracy of the hypothetical base-rate forecaster was 45%. In this case, parents were better at predicting their children's preferences, $t(114) = 2.97$, $p < 0.01$, $d = 1.04$.

Reliability of children's preferences: Preference reliability was assessed for Meal Plan 2 in Study 1. Here, the 16 children who filled out the preference retest four months later did not differ from the children who did not participate in the retest in terms of sex, $\chi^2(1,30) = 0.20$, $p = 0.72$, $\varphi = 0.08$, how often they ate at the canteen, $\chi^2(1, 30) = 1.10$, $p = 0.42$, $\varphi = 0.19$, or how accurately their parents predicted their preferences at the first measurement point, $t(26) = 1.17$, $p = 0.25$, $d = 0.45$. Therefore we assume that children's reliability and parents' prediction accuracy assessed at the second measurement point can be generalized to the entire sample.

Retest reliability was on average 51% ($SD = 21\%$), meaning that after 4 months, only about half of the choices were identical with the first measurement point. For the other half, children chose a different dish. Therefore parents' prediction accuracy in general could not be much higher than 51% (again with chance performance on the four dishes being 25%). We compared parents' prediction accuracy for their children's choices at Time 1 with accuracy for preferences at Time 2 and found that the predictions parents had made at the first measurement point correctly predicted on average 55% of children's meal choices at the second measurement point (not significantly different from children's preference stability, $t(15) = -0.64$, $p = 0.53$, $d = 0.16$, nor from these parents' prediction accuracy for their children's meal choices at first measurement point, $t(15) = -1.03$, $p = 0.32$, $d = 0.28$). The finding that parents' prediction accuracy was about as high as children's preference reliability implies that parents performed about as well as possible.

Prediction accuracy of likes versus dislikes: To test parents' prediction accuracy for likes versus dislikes, we dichotomized the preference scale used in Study 2 (scale values "like it" and "like it very much" versus "don't like it at all" and "don't like it very much"). Overall, children on

average liked 63% of the 30 meals, and parents on average predicted that their child would like 64% of the meals. We took the different base rates of likes and dislikes into account by separately calculating how many of the children's likes parents predicted correctly and how many of their dislikes were predicted correctly. Parents were more often correct in predicting likes than in predicting dislikes: on average across all dyads, 86% ($SD = 11\%$) of all likes and 68% ($SD = 24\%$) of all dislikes were predicted correctly, $t(57) = 5.2$, $p < 0.01$, $d = 0.65$.

On an individual level looking at erroneous predictions, we found that the majority of the parents (72%) more often predicted a dislike to be a like and thus assumed that their children liked more dishes than they actually did (26% of parents showed the reverse pattern and 2% as often mistook a like for a dislike as vice versa). These results imply that most parents facing uncertainty as to whether a meal will be fancied by their child assume that their child will like it. This 'optimistic' attitude would lead parents to expose their children to a larger variety of foods.

Cue use

Projection: To find out whether parents could have improved their prediction accuracy by using their own preferences as a cue more often we looked at the similarity between the meal preferences of each parent and their child. If this similarity is higher than the parent's prediction accuracy, then that parent could have improved his or her accuracy by projecting own preferences more often.

For Meal Plan 1 in Study 1, parents on average preferred the same meal as their child in 57% of all cases ($SD = 20\%$). This number is significantly lower than the mean parent prediction accuracy of 73%, $t(24) = -3.55$, $p < 0.01$, $d = 0.63$, and implies that on average parents could not have improved their prediction accuracy by projecting more. Assessed at the individual level, only 15% of the parents could have improved their prediction accuracy by projecting more often (because their similarity was higher than their prediction accuracy). For Meal Plan 2, parents had the same meal preference as their children in 37% ($SD = 21\%$) of the cases. Again, this number is significantly lower than their mean prediction accuracy of 46%, $t(27) = -2.01$, $p = 0.05$, $d = 0.39$. On this second meal plan, only 36% of the parents could have improved their prediction accuracy by projecting more often.

In Study 2, four parent–child dyads were excluded from the analysis because parents had not stated their own preferences. Parents' similarity with their children's meal preferences was on average 30% ($SD = 14\%$), and as in Study 1, parents' prediction accuracy was significantly higher than their actual similarity, $t(57) = -6.60$, $p < 0.01$, $d = 1.15$. Only 21% of the parents could have improved their prediction accuracy by projecting their own meal preferences more often.

Healthfulness: Children's choices for Meal Plan 2 in Study 1 matched the meal they identified as most healthful

in 34% of the cases ($SD = 27\%$). Similarly, meals that parents found to be most healthful matched their children's actual meal choices in 30% ($SD = 22\%$) of the cases, which is significantly lower than parents' actual prediction accuracy, $t(26) = 3.04$, $p < 0.01$, $d = 0.57$. Furthermore, parents' and children's agreement on which meals are healthiest was 33% ($SD = 19\%$). Overall, only 36% of the parents could have improved their prediction accuracy by using the cue of perceived meal healthfulness more often. Together, these results suggest that healthfulness is not a good cue for children's meal choices and their prediction.

Discussion

Through two studies in which we asked children and their parents to make realistic meal choices, we explored how well parents predicted their child's lunch choices, how well they thought they knew their child's preferences, how accurate they were at predicting likes versus dislikes, and which cues may have been involved in their predictions. We discuss our findings on each of these research questions in turn.

Prediction accuracy and estimates of prediction accuracy

We found that on average, parents' prediction accuracy for their child's meal preferences was about as high as it could be, given children's relatively unstable meal preferences over time. Prediction accuracy in our studies was higher than the accuracies reported in many previous studies on preference prediction. Parents' predictions for their own child were generally better than the benchmark criteria we measured, namely the hypothetical base-rate forecaster, and accuracy of agents' predictions when applied to all other targets in each of the studies, indicating that specific knowledge about the target (the parent's own child) plays a role. Our results suggest that agents can predict a target's preferences more accurately if the prediction domain is a familiar one where predictions are common. We also found that on this ecologically valid and relevant task parents did not generally overestimate their prediction accuracy. This is in contrast to results of many previous studies suggesting that people are generally overconfident in their abilities (e.g, Alba & Hutchinson, 2000).

The fact that parents' prediction accuracy was reasonably good overall in this task is all the more surprising given the factors that make it challenging: Food choice depends greatly on situational influences, including social factors (Clendenen et al., 1994; Herman, Roth, & Polivy, 2003), environmental factors (Hill et al., 2003), the variety of food eaten recently, and whether the food was chosen day-by-day or in advance for an upcoming period (Kahneman & Snell, 1992; Simonson, 1990). These influences distinguish food from many other consumer goods, including those investigated in the preference prediction studies discussed earlier, making preferences more likely to vary over time, and thus more difficult to predict. Furthermore, according to the "family paradox" parents' food preferences frequently differ from those of their children (Rozin, Fallon, & Mandell, 1984; Rozin, 1991). This limits the possibility of using projection of own preferences, which has been found to be a successful prediction strategy in some other domains not related to food (Hoch, 1987). Finally, children's food preferences are influenced by those of their peers (Birch, 1980b). Because school lunches of the sort we investigated are presented in a setting where children eat together with their peers rather than with their parents, these social influences can create context-specific preferences that parents might not be aware of.

Predicting likes and dislikes

Parents were better at predicting which meals their children liked than which they disliked. This is surprising because from the theoretical perspective of information theory, rarer events, such as dislikes in our studies, are considered informative (Shannon, 1948). Also, insofar as children might communicate dislikes with more emphasis than likes, they should be better remembered (Eisenhower, Mathiowetz, & Morgenstein, 1991). However, West (1996) argues that the informativeness of an event also depends on the costs of the particular prediction error one can commit regarding that event, be it a false positive or false negative. Given that about three-quarters of the parents in Study 2 were more likely to predict that a meal will be liked rather than disliked when they are in doubt about their child's preference, missing a liked meal may have been perceived as more costly than the erroneous assumption of a dislike. Thus, parents may have put more value on exposing their children to a large variety of different foods.

Cue use

In both studies, parents' predictions seemed to arise through the use of specific knowledge of their children's preferences and possibly also through some projection of their own preferences. Healthfulness of meals did not seem to be a particularly useful cue for parents' predictions. One reason for this finding could be the low agreement between parents and children on which food is the healthiest. An alternative explanation is that the majority of lunches on the meal plans we used may have appeared to be equally healthful, and therefore healthfulness might not have been a differentiating cue for parents' predictions. In general, whether or not parents based some of their child's meal predictions on cues, including their own preferences or perceived healthfulness, they could not have improved prediction accuracy further by relying on them more often. These findings are in line with our results on prediction accuracy; namely, that parents' prediction accuracy was as high as possible given children's preference stability.

Limitations

Especially in Study 1, the statistical power to detect medium to large effects was sometimes low due to the small sample size. Also, in Study 1 almost half of those parents who reported their sex were fathers. In many households fathers spend less time with children than mothers, including food related activities (Sayer, Bianchi, & Robinson, 2004). Thus, the fact that so many fathers filled out our meal plan questionnaires might have led to a lower overall prediction accuracy in Study 1. An alternative interpretation of the high number of participating fathers is that these particular individuals were more involved in household chores or child upbringing than in many other families. Furthermore, in Study 2 our participants were visitors at a scientific event, and thus may have had a socio-economic status above average. This, together with the composition of participating parents in Study 1, might limit generalizability of our findings to more diverse populations.

Conclusions

Contrary to the pessimistic conclusions of previous studies, people may not be so bad at predicting the preferences of others after all—if they do it in situations where preference prediction naturally occurs most often, namely for targets who are very familiar and in a domain that is of daily importance. More specifically, parents have the ability to accurately predict both, likes and dislikes. This knowledge is essential for parents to be able to make necessary healthful food compromises that children do not seem to make if the meal choice is left to them alone (Klesges, Stein, Eck, Isbell, & Klesges, 1991). Thus, parents' predictions of children's food preferences not only constitute an interesting domain for studying prediction accuracy and cue use—they are also crucial to the ongoing discussion about how to help children eat a healthier diet and how to help parents support their children in this effort.

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