IF IT'S HEALTHY AND YOU KNOW IT, DO YOU EAT?

HEALTH PROMPTS REDUCE PRESCHOOLERS' CONSUMPTION

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UNDER REVIEW

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Abstract

We propose that marketing food as having instrumental, health benefits undermines preschoolers' enjoyment of this food and decreases their motivation to consume it. In support of this proposition, a survey study with parents of preschoolers finds that emphasizing health benefits does not increase consumption of vegetables above and beyond merely serving them (study 1). Two experiments involving actual consumption then show that preschoolers (age 3-5) rate crackers as less tasty and consume fewer of them when these children receive information on the crackers' instrumental, health benefits, as opposed to no information on benefits or information on the crackers' experiential, taste benefits (studies 2-3). These results add to the understanding of how young children respond to food marketing by deciding what and how much to consume. We discuss how children's decision processes may differ from adults'.

As obesity rates increase around the world (Brownell and Horgen 2004; Hill and Peters 1998), marketers, health providers, policy makers, and educators constantly attempt to get people to eat more healthfully (e.g., Chandon and Wansink 2007a), for example, by including nutritional information on food labels (Balasubramanian and Cole 2002) and advertising the importance of starting healthy consumption at an early age (e.g., slogans such as "An apple a day keeps the doctor away"). Our research argues and shows that marketing food items as "healthy," as opposed to no information or information on taste, can undermine the natural tendency of preschoolers as young as three years old to eat these food items, and decreases their level of enjoyment of these items.

Besides satisfying hunger, eating is motivated by two main benefits: taste and healthiness. Like satisfying hunger, taste is an experiential (intrinsic) benefit in that it is an integral part of the eating experience. By contrast, health benefits are instrumental (extrinsic) in that achievement of these benefits is separated and conditioned on completion of the activity. Thus, attending to health benefits can make eating an extrinsically motivated activity (Higgins and Trope 1990; Ryan and Deci 2000; Shah and Kruglanski 2002). Indeed, recent research shows that attending to the goals an activity serves, that is, its instrumentality (e.g., its healthiness), as opposed to the experience of pursuing the activity (e.g., pleasantness), undermines intrinsic motivation and leads to an overall less positive experience (Fishbach and Choi 2012).

Accordingly, we predict that marketing pitches emphasizing a food's health rather than taste benefits, or not emphasizing benefits at all, would shift attention from the experience (i.e., enjoying the taste) to the instrumentality (i.e., promoting health) of eating. Moreover, we predict

this shift in attention would decrease enjoyment of the food such that young consumers will rate it as less tasty and will therefore reduce current and planned consumption of the item.

Of particular interest is testing these predictions among children as young as three to five years old. Preschoolers are frequently exposed to food-related persuasion attempts in person and through the media (Desrochers and Holt 2007; Powell, Szczypka, and Chaloupka 2007). Additionally, children ages three to five years old seek more immediate rewards and do not have a chronic health goal active. As such, we assume these children rely primarily on taste, that is, the experiential aspect of eating, when deciding what and how much to eat. Children further use health information only to the extent that it is useful for making taste inferences. Adults, on the other hand, rely, at least partially, on health and more complex considerations such as guilt-reducing mechanisms (Chandon and Wansink 2007b; Coelho Do Vale, Pieters, and Zeelenberg 2008; Raghunathan, Naylor, and Hoyer 2006). Accordingly, if children deem healthy-framed food less tasty, they will reduce consumption.

THEORETICAL BACKGROUND

The actions in which consumers engage offer various types of benefits. Some are more experiential, and hence the reward is an immediate part of pursuing the activity, and some are more instrumental and offer rewards only after the action is completed. Experiential benefits are an integral part of the activity itself and are realized at the time of pursing the activity, such as relaxing while reading a good book. Instrumental benefits, on the other hand, are realized only after the action is completed and are associated with the goal the action represents. For example, a consumer might read a bestseller only in order to be able to have a conversation about it, or to

appear as up to date, making reading the book instrumental in achieving these goals. Similarly, exercising at the gym is instrumental in helping people stay in good shape and lose weight (a delayed reward), but it also provides a good experience by allowing one to relax or meet new people (a reward that is part of the activity). Thus the same activity can be more instrumental or experiential, depending on the context. When pursuing an activity mainly for the sake of pursuing it, the activity is considered experiential—the intrinsic experience forms its end. When pursuing an activity mainly as a means to an end, the activity is instrumental for achieving the end and is considered extrinsically motivated (Choi & Fishbach, 2011; Shah & Kruglanski, 2002).

Focusing on the instrumental benefits an action offers can have negative consequences on motivation, persistence, and overall experience, similar to the way external rewards can undermine motivation (Deci, 1971; Lepper, Greene, and Nisbett 1973). In particular, Fishbach and Choi (2012) show that attending to the instrumental benefits can undermine consumers' enjoyment from creating origami and practicing yoga, and undermine their intrinsic motivation to engage in these and other activities.

In this paper, we examine the interplay between experiential and instrumental benefits in the context of eating. In addition to satisfying hunger, eating is mainly motivated by taste and healthiness. Taste is an experiential benefit in that it is an integral part of the eating experience. In particular, enjoying the good taste of the food items provides an immediate reward that is an integral part of the eating activity. The food healthfulness, by contrast, is an instrumental benefit in that achievement of this benefit is separated and conditioned on completion of the activity. In particular, eating vegetables or a low-fat dish provides a delayed reward in the form of possibly losing weight or maintaining a low cholesterol level. Such rewards are realized only well after

the eating action in completed. We next review research on how emphasizing the health and taste benefits affect food consumption and taste ratings.

EATING HEALTHY

With obesity being declared as a global epidemic (Caballero 2007; Wang and Beydoun, 2007), academics, as well as marketers and health practitioners, are striving toward a better understanding of how to make people eat healthier food. Different initiatives, such as manipulating serving size and size labels (Aydınoğlu and Krishna 2011; Chandon and Wansink 2007b; Dubios, Rucker, and Galnisky 2012) or including nutritional information on packages (Kiesel, McCluskey, and Villas-Boas 2011; Moorman, Ferraro, and Huber 2012), have been investigated, some proven more successfully than others.

An important empirical question is whether emphasizing the instrumental, health benefits of food items increases or taste ratings and how it influences consumption. Research with adult participants generated mixed results (see Chandon and Wansink 2012 for a review). In some cases, marketing food as healthy can lead to lower taste ratings, as reported by Raghunathan et al. (2006). In particular, when the researchers presented consumers with food that was framed as healthy (e.g., low fat), compared to unhealthy (e.g., high fat), consumers rated the healthy food as less tasty and were also less likely to choose it in a forced-choice task. For example, people rated a lassi drink described as "made out of real mango pulp and milk; generally considered very healthy" as less tasty compared to a lassi drink that was described as "generally considered unhealthy."

In other cases, participants perceived the unhealthy-framed food as less tasty. For example, Irmak, Vallen, and Robinson (2011) found that dieters, but not non-dieters, rated unhealthy-named food (e.g., candy chews) as less healthy, less tasty, and eventually consumed less of it, compared to when the same food had a healthy name (e.g., fruit chews). According to Irmak et al. (2011), dieters self-manipulate taste perception (Gibbs 1991) to decrease consumption from food they should not consume. As such, they perceive unhealthy-framed food as less tasty, and as a result, they consume less of it.

Presenting food that is usually perceived unhealthy as healthy can also increase consumption. In particular, consumers ate more M&Ms when these were framed as low fat (compared to a neutral frame) and provided lower calorie estimation for them (Wansink and Chandon 2006). This effect was more pronounced among overweight consumers who are more sensitive to such labels. Similarly, Provencher, Polivy, and Herman (2008) report increased intake of a cookie framed as an "oatmeal snack" compared to an "indulgent gourmet snack." Marketing food as healthy can also increase reported hunger levels (Finkelstein and Fishbach 2010), especially among those who are not concerned about weight-watching. Consistent with this finding, Crum et al. (2011) found that presenting a milkshake as "sensible" and containing 140 calories led to lower satiation levels, as measured by ghrelin levels (a hormone associated with energy insufficiency), compared to when the same milkshake was presented as "indulgent" and containing 620 calories. They found no differences in taste ratings of the two milkshake frames.

To summarize, marketing food as healthy (versus not providing health information, or providing taste instead of health information) can lead to higher or lower taste ratings, depending on the situation and individual differences (e.g., whether the consumer would like to lose

weight), which in turn can affect consumption. Adults rely on a complex set of considerations when making inferences about a food's taste and rely on considerations beyond taste when deciding what and how much to consume (Chandon and Wansink 2007b; Coelho Do Vale et al. 2008; Vartanian, Herman, and Wansink 2008). As a result, past research sometimes reports an increase or decrease in taste ratings when the health benefits are emphasized. To better understand the effect of health benefits, in this paper we examine how emphasizing the instrumental, health benefits, relative to no such emphasis or emphasizing the experiential, taste benefits, affects taste ratings and consumption among young consumers, as young as three years old. This population is of special interest for several reasons, as we review in the next section.

THE PRESENT RESEARCH

Young children are frequently exposed to advertising and persuasion attempts. Although children ages three to seven years old are able to distinguish commercials from regular television programs (Blosser and Roberts 1985; Levin, Petros, and Petrella 1982), they are often not aware of the motives behind these advertisements to make them purchase the featured products (e.g., Robertosn and Rossiter 1974). At the same time, exposure to advertisements can be quite influential, affecting children's requests of toys (Burr and Burr 1977; Robinson et al. 2001) as well as food consumption (Borzekowski and Robinson 2001). Understanding how such marketing pitches, emphasizing the health or taste or no benefits, affect children's consumption and enjoyment of the food is therefore crucial.

When trying to assess the effect of health and taste messages on three- to five-year-olds' consumption and judgments, we assume these children rely primarily on taste when making

decisions about food. First, children this age have low self-control; they generally look for immediate rewards and have difficulty delaying gratification (Miller and Karniol 1976a, 1976b; Mischel and Mischel 1983; Mischel, Shoda and Rodriguez 1989). Therefore, they look for food that they judge as tasty in order to enjoy the immediate reward of good taste. Moreover, unlike adults, who may have a chronic dieting goal that affects their perception of food items and consumption behavior (Martz, Sturgis, and Gustafson 1996; Ward and Mann 2000), most children do not have such a goal. As such, children are driven mainly by the hedonic aspects of eating, namely, satisfying hunger and enjoying the food's taste. Therefore, food that is presented as tasty is likely to be attractive. The attractiveness of food that is presented as healthy depends on children's taste inferences from health information.

This reliance on taste is expected to affect children's consumption and enjoyment of food. Specifically, as reviewed above, shifting attention to the instrumental benefits has been shown to lead to overall less positive experiences relative to when the experiential benefits are emphasized or even when no benefits are emphasized. This is because people make the inference that there are less intrinsic benefits in engaging in the activity. Thus, emphasizing the instrumental, health benefits of food items, as opposed to the experiential, taste benefits or no benefits at all, should lead to lower taste ratings.

Because taste is the focal dimension on which children make consumption decisions, they will also consume less of food items they judge to be less tasty. Thus, unlike adults, for whom emphasizing the health benefits may increase or decrease taste ratings and indirectly affect consumption, children ages three to five years old will likely decrease consumption and taste ratings when we shift attention to the instrumental, health benefits. We therefore predict the following:

H1: Emphasizing the health benefits of food items will be ineffective and can decrease current and planned consumption, compared to when no benefits or the taste benefits are emphasized.

H2: Emphasizing the health benefits of food items will decrease taste ratings, compared to when no benefits or the taste benefits are emphasized.

To test these hypotheses, we collected data from preschoolers and parents of preschoolers across three studies. Parents reported what persuasive appeals they use when trying to convince their children to eat healthy and how effective these appeals are. This survey data provides us with initial evidence concerning how children respond to these appeals from the parents' point of view. We also collected data from three- to five-year-old children in a local daycare. These data allow us to test more directly how health, taste, and no-frame appeals affect children's actual consumption and taste ratings.

In particular, in the first study, we test Hypothesis 1 by asking parents of children ages three to five to report the frequency of serving vegetables, as well as the frequency of persuading their children to eat vegetables using health- and taste-based claims. We predict that whereas taste-based claims will increase consumption above and beyond merely serving vegetables, health-based claims will not. The second study tests the first hypothesis in an experimental setting, and predict that children ages three to five years old consume less and are less likely to choose for future consumption crackers that were framed as healthy, compared to tasty and neutral frames. The last study examines the second hypothesis, by exploring whether children ages three to four years old judge health-framed food as less tasty, which in turn reduces consumption of this food.

STUDY 1: THE PARENT'S PERSPECTIVE – HEALTH-BASED MESSAGES DO NOT INCREASE CONSUMPTION

As a first step, we sought to explore the persuasive appeals parents use when trying to convince their children to eat healthy, and how effective these appeals are in increasing children's healthy food consumption. To that end, we asked parents of three- to five-year-old children to indicate one food item they try hardest to convince their children to eat. Focusing on this item (vegetables, as explained below), we then asked parents to report (a) how frequently they serve vegetables at meal time, and how frequently they try to persuade their children to eat vegetables by using (b) health-based claims and (c) taste-based claims. As our dependent variable, we asked parents how frequently their children eat vegetables.

Method

Eighty-nine parents of children at the relevant age group (3-5 years old) were recruited through Amazon.com's Mechanical Turk (MTurk) and completed an online survey (mean parent age = 32; 54% female; 75% Caucasian, 11% African-American, 6% Asian-American and 6% Hispanic; 85% with some college education or more; 67% employed part-time or full-time). The surveyed parents listed one food item that they often try to convince their children to eat by saying it is healthy and one food item that they try to convince their children to eat by saying it is yummy. For both questions, the majority of parents listed vegetables as their answer (e.g., corn, spinach, carrots, cauliflower). Specifically, for the "convince by saying healthy" question, 75% listed vegetables and 25% listed other items (fruits, dairy, meat, and others, $X^2(1) = 22$, $p < .001$);

for the "convince by saying yummy" question, 62.5% listed vegetables and 37.5% listed other items as above ($X^2(1) = 5.5$, $p < .05$).

Participants further rated their agreement with several statements regarding their children's consumption of vegetables (1 = *strongly disagree*, 7 = *strongly agree*): (a) the frequency of serving vegetables: "During mealtime, I often serve vegetables;" (b) health-based persuasion: "I often tell my child that vegetables are healthy" and "I often tell my child that vegetables will make you strong;" and (c) taste-based persuasion: "I often tell my child that vegetables are yummy" and "I often tell my child that vegetables are fun." As a measure of consumption, they rated how often their children eat vegetables.

Results and Discussion

To understand the relative effectiveness of the different persuasion techniques on consumption, we first created "health-based" and "taste-based" indices by averaging the two health-based persuasion items ($r = .57$, $p < .005$) and the two taste-based persuasion items ($r = .28$, $p < .01$), respectively; we get similar results when using each of these variables separately. We then regressed the dependent measure, consumption, on four variables: frequency of serving vegetables, health-based index, taste-based index, and what item, vegetables (coded as 1) or other (coded as 0), parents report they try to convince their child to eat by telling their child it is healthy.

We find the strongest predictor of vegetable consumption is merely serving them during mealtime ($\beta = .48$, $t = 4.65$, $p < .005$), followed by using taste claims ($\beta = .21$, $t = 2.31$, $p < .05$). However, using health claims does not contribute to consumption above and beyond merely

serving the vegetables and using taste-based claims ($p > .2$). Thus, even though parents report using health claims more frequently ($M_{\text{healthy and strong}} = 6.25$, $SD = .98$) than taste claims ($M_{\text{yummy and fun}} = 5.22$, $SD = 1.2$; $t(88) = 7.23$, $p < .001$), these health claims do not increase vegetables' consumption above and beyond merely serving them.

We additionally find that the effect of food type (vegetables vs. others) that parents convince their children to eat by saying it is healthy is negative, and marginally predicts vegetables consumption ($\beta = -.164$, $t = -1.87$, $p = .065$). This finding suggests that parents who report trying to convince their children to eat more vegetables by saying they are healthy report their children also eat fewer vegetables than children whose parents convince them to eat other food items by telling them these are healthy. Of course, given the correlational nature of this study, it could be that because these children consume fewer vegetables, parents may indeed need to convince them to eat vegetables more often.

To summarize, even though parents frequently use health claims when trying to convince their children to eat more vegetables, these claims do not increase vegetables' consumption above and beyond serving them and using taste claims. A major limitation of this study is that it allows us to make conclusions only about correlations among variables and not about causality links among variables. To overcome the correlation-based nature of this study and to test the reasons health claims fail and may even backfire, we conducted two experimental studies that test whether framing food as healthy (vs. tasty or no frame) undermines preschoolers' taste evaluations and actual present and planned consumption.

STUDY 2: HEALTH FRAME UNDERMINES CONSUMPTION AND CHOICE

This study tests our hypothesis that emphasizing the health benefits of otherwise desirable food items decreases present and planned consumption. Because we found that children are frequently exposed to persuasion appeals involving consumption of vegetables, we used a different type of food here: Wheat Thins crackers. These crackers fit our research, because we needed a product we could truthfully represent and that could be perceived as both healthy and tasty, and for which we could accurately measure consumption. A pretest with eight mothers of children in the relevant age group confirmed these moms thought their children would *like* the Wheat Thins crackers, ($M = 5.78$, $SD = 1.2$, $t\ (8) = 4.44$, $p < .01$) and would think these crackers were *healthy* ($M = 5.13$, $SD = 0.83$, $t\ (8) = 3.81$, $p < .01$) and *tasty* ($M = 5.78$, $SD = 0.97$, $t\ (8) = 5.48$, $p < .01$). Significance tests are based on a one-sample t-test against the midpoint, 4, on a 7-point scale (1=*not at all*, 7=*very much*).

Preschoolers in our main study consumed the Wheat Thins crackers twice, approximately two weeks apart: once after receiving a marketing pitch regarding the crackers' health benefits, taste benefits, or no pitch (manipulated between subjects), and a second time after receiving no information about the crackers. The marketing pitch about the crackers was embedded in a story the experimenter told the children. We chose to use story telling as the experimental procedure because listening to a story in the classroom is a routine activity for children in this day care, and familiarity with the situation is critical for research with children (e.g., Peracchio 1990). We predicted the health message in the first measurement would decrease present and planned consumption compared with the taste and control messages and compared with the second measurement (no health information).

Method

Sixty-six children (age range: 4.5-5.5 years, 63% female) completed the experiment in one of three marketing-pitch conditions: healthy versus yummy versus control, manipulated between subjects. Each participant completed the study individually in a designated part of the classroom. In the "healthy" and "yummy" conditions, the experimenter read the children a story about Tara, who ate Wheat Thins crackers before going to play (see figure 1). Depending on the condition, different benefits were emphasized. In particular, in the "healthy" condition, the story emphasized the crackers' health benefits (the story read, "Tara felt strong and healthy, and she had all the energy…"), as did the experimenter, who pointed to her own arm muscles when reading that sentence. To verify the child understood the story, the experimenter asked after reading it, "Did you know that Wheat Thins crackers are good for your health?" In the "yummy" condition, the story emphasized the crackers' taste benefits ("Tara thought the crackers were yummy, and she was happy…"), as did the experimenter, who pointed to her own stomach when reading that sentence. As in the "healthy" condition, the experimenter asked after reading the story, "Did you know that Wheat Thins crackers are yummy?" Both appeals (healthy and yummy) were emotionally equivalent and presented similar pictures of a smiling girl. No story was used in the control condition.

Insert figure 1 about here

In all conditions, the experimenter then offered the child the chance to eat Wheat Thins crackers. To minimize interaction between the experimenter and the child during eating, the experimenter invited the child to move to another table labeled as the "eating station," where a

bowl with 15 crackers sat. The number of crackers the child ate served as our dependent variable to measure consumption.

When the children finished eating, they moved back to the main experiment table to choose between a bag of Wheat Thins crackers and a bag of Ritz crackers to take home. The choice of crackers served as our dependent variable to measure planned consumption. The experimenter then thanked participants, gave them a small thank-you gift and the crackers they chose, and had them return to class activities.

To explore whether the effect of the health message is caused by attention to health benefits (as we predicted) versus knowledge about these benefits, we approached participants in the "healthy" and "yummy" conditions again one to three weeks after they had completed the above procedure. These children then completed the control-condition procedure (i.e., eating crackers and post-eating choice). As a recall measure, the experimenter asked participants at the end of the session, "A few weeks ago I read you a story about Tara and these crackers. Do you remember what Tara thought about these crackers?," and recorded the open-ended responses. As in the first part, the experimenter then thanked the children and gave them a small thank-you gift and the crackers they chose.

Results and Discussion

Seven children, roughly equally distributed across conditions, did not want to eat at all (e.g., one had an upset stomach, another wanted to leave), and two children (from the "yummy" condition) were highly distracted, resulting in a valid sample of 57 children. Including everyone in the analysis does not significantly affect the results.

Consumption: As predicted, children in the "healthy" condition ate fewer crackers than children in the "yummy" and "control" conditions ($M_{healthy}$ = 3.1, SD = 3.25; M_{yummy} = 7.2, SD = 6.13; $M_{control}$ = 9.07, SD = 5.6, $F(2, 54) = 6.94$, $p < .01$). Planned contrasts revealed a significant difference between the "healthy" and "control" conditions ($t(54) = 3.7$, $p < .005$) and between the "healthy" and "yummy" conditions ($t(54) = 2.67$, $p < .05$), but not between the "yummy" and "control" conditions ($t < 1$). This finding supports our consumption hypothesis that health pitch reduced consumption among young children.

Thirty-five of the participants in the "healthy" and "yummy" conditions participated in the second session (the remaining 7 were not in the classroom at the time the second session was conducted). Supporting our prediction, we found an interaction between the message and time of measurement ($F(1,33) = 8.27$, $p < .01$; figure 2). Children who originally were in the "healthy" condition increased their consumption from t_1, i.e., immediately after the appeal (M = 3.1) to t_2, i.e., 2 weeks after the appeal (M = 7.31; $t(16) = 3.95$, $p < .005$), whereas consumption of those originally in the "yummy" condition did not change ($t < 1$). Moreover, at t_2, no differences in consumption existed between participants who originally were in the "healthy" and "yummy" conditions (7.31 vs. 7.86; $t < 1$).

Insert figure 2 about here

Recall: In the second measurement, we coded children's responses to the recall question into three categories: "strong/healthy," "yummy/tasty/good," and "nothing/other" (whenever the child did not remember, or gave an unrelated answer, e.g., "yes"). About half (53% of those originally in the "healthy" condition and 47% in the "yummy" condition) remembered the message correctly. Their consumption at t_2 was similar to those who did not remember correctly.

In particular, in ANOVA with correct recall (yes vs. no) and condition at t_1 (healthy vs. yummy) as independent variables and consumption as the dependent variable, neither main effect nor the interaction were significant (p >.28). This suggests that health information reduces consumption among children only when it is emphasized at the time of consumption (i.e., at t_1, when children consumed the crackers immediately after hearing the story). When the health information is not emphasized, even if the child can retrieve it, it does not impact consumption; thus attention to healthfulness, rather than knowledge about it, causes the effect.

Choice: We find a marginal effect of the message manipulation on choice between the Wheat Thins and Ritz crackers ($X^2(2) = 4.63$, p =.09). Consistent with our prediction, children in the "yummy" condition planned to consume the crackers more than those in the "healthy" condition, as they were more likely to choose them over the Ritz crackers (M_{yummy} = 65% vs. M_{healthy} = 32%, $X^2(1) = 4.62$, $p < .05$). Children in the control condition were in the middle (46%) and not significantly different than those in the "yummy" and "healthy" conditions. Similar to the consumption results, choice at t_2 was similar across the two conditions (i.e., comparing those who originally were in the "healthy" and "yummy" conditions at t_1;, $X^2(1) < 1$), suggesting health information reduces planned consumption also only when it is emphasized at the time of choice (figure 3). Finally, current consumption was positively correlated with planned consumption ($r(57) = .42$, $p < .005$).

Insert figure 3 about here

Taken together, these results confirm our hypothesis that marketing food as healthy decreases preschoolers' tendency to consume it, leading to decreased current and planned consumption. Importantly, whereas our first study found health claims do not increase consumption, the controlled experiment with actual consumers (i.e., the children rather than the

parents) found health claims actually decrease consumption. The experimental approach is superior to the survey used in the first study in the sense that we could manipulate which benefits are emphasized, allowing isolation of the distinct effect of each. Because we further tested children's actual consumption, as opposed to parents' recollections, we can conclude an emphasis on health not only does not help but it can backfire and reduce actual consumption.

STUDY 3: HEALTH FRAME UNDERMINES CONSUMPTION AND EVALUATION OF TASTE

Our third study had two main goals. First, we test whether preschoolers experience healthy-framed foods as less tasty, thereby decreasing their consumption. We predict that an emphasis on health benefits (an instrumental benefit) undermines perceived taste (an experiential benefit) and the result is lower consumption. Second, we examine whether the effect of reduced consumption is replicable among younger children (ages 3-4).

To test our predictions, we ran a study similar to our second study, with several modifications. First, we included post-eating liking measures to assess taste perception. Second, because in study 2 "yummy" and "control" frames had similar effects on consumption, we compared a message containing only health information to a control message that did not emphasize any benefits of the crackers. In particular, unlike study 2 where the control condition did not present any message, in this study the control condition presented a similar message to the one in the health condition, but without emphasizing any benefits.

Method

Forty-nine children (age range = 3-4 years; 41% female) were assigned to either a healthy-frame or control-frame condition. All participants first went through a preliminary training procedure for the "hand-opening" measure (Egan and Diermeier, 2012), which we later used to measure liking. Specifically, the experimenter first asked the children if they liked puppies, and then asked them to show how much they liked puppies by opening their hands. The experimenter explained that if they liked puppies a lot, they should open their hands wide, but if they did not like them very much, they should open their hands a little. The children then opened their hands accordingly, and the experimenter measured the hand spans using a measuring tape. The experimenter repeated the same procedure with spiders, to train the children how to use their hand spans when they did not like an item. In some cases, children did not like puppies or did like spiders, so the experimenter replaced puppies with other non-food liked items (e.g., cats, going to the beach) and replaced spiders with other non-food disliked items (e.g., germs, going to the dentist). Finally, the experimenter measured the full span of their hands to serve as a baseline.

Then, depending on the experimental condition, the experimenter read a story that either emphasized the health benefits or not (figure 4). As in study 2, the experimenter then offered all children the opportunity to eat the crackers from the story. After finishing eating, the children returned to the main experiment table, where they were asked to evaluate the crackers on three measures: (1) Smiley scale (Birch, Zimmerman, and Hind, 1980; Macklin and Machleit, 1990): The experimenter asked the child to indicate which face represented how much they enjoyed the crackers (see figure 5). If they liked the crackers a lot, they were told to choose the right-most face. If they did not like the crackers, they were told to choose the left-most face. And if they

liked the crackers only somewhat, or were not sure, they were instructed to choose the middle face. (2) Similarity scale: The experimenter asked the children to place a model of the Wheat Thins crackers on a scale, where one side was marked with a picture of ice cream and another side with a picture of an onion (see figure 5). A pretest with 17 moms of children in the relevant age group, showed ice cream and onions are the food items children in this age group like and dislike the most, respectively. The assumption in this scale is that placing the model close to the ice cream (onion) indicated the child's increased (decreased) liking of the crackers. For this assumption to be valid, the experimenter first verified the child indeed liked (disliked) ice cream (onions). In the rare cases in which the child liked onions (all participants liked ice cream), we replaced them with eggplants or mushrooms. (3) Hand-opening measure: The experimenter asked the children to indicate by opening their hands how yummy these crackers were, and then measured their open span with a measuring tape. The experimenter then thanked participants, gave them a small thank-you gift, and had them return to class activities.

Insert figures 4 and 5 about here

Results and Discussion

Two children did not want to eat at all (one from each condition), and three children (two from healthy and one from control conditions) were highly distracted (e.g., left in the middle of the experiment), resulting in a valid sample of 44 children. Including everyone in the analysis does not significantly affect the results.

As predicted, children in the "healthy" condition ate fewer crackers than children in the "control" condition ($M_{healthy}$ = 4.67, SD = 5.54; $M_{control}$ = 10.00, SD = 5.93; $t(42) = 3.07$, $p <$ .005), extending study 2's results to a younger population.

To assess liking, we first obtained a measure of the hand-opening measure by dividing children's responses to the "how yummy" question by the overall span of their hands, resulting in a score between 0 (no liking) and 1 (highest liking possible). Then, after standardizing all three variables (hand-opening, smiley, and similarity scales), we created an average score (Cronbach's alpha = .54). As predicted, participants in the "healthy" condition liked the crackers less than those in the "control" condition ($M_{healthy}$ = -.196, SD = .93; $M_{control}$ = .197, SD = .37; $t(42) = 1.86$, p =.035, one-tail).

To test whether liking mediates the effect of framing on consumption, we also establish the effect of the proposed mediator (liking) on the dependent variable, consumption, controlling for the framing manipulation ($t(41) = 2.08$, $p < .05$), in addition to establishing above the (marginal) effect of the framing manipulation on liking. Following the bootstrapping procedure (Preacher and Hayes 2004; Zhao, Lynch, and Chen 2010) with 5,000 resamples and setting a 95% confidence interval, we find significant mediation (B = .99, Low C.I. = .0634, High C.I. = 2.507).

To summarize, our second study replicates the effect of health (vs. neutral) marketing pitch on consumption, such that a health pitch decreases consumption. Additionally, we find support for the process by which health messages reduce food consumption: the health pitch (an instrumental benefit) decreases enjoyment of the crackers (an experiential benefit), such that those in the health-frame condition experienced the crackers as less tasty. The experience of

worse taste, in turn, led to decreased consumption. Thus, young children are susceptible to a "healthy=un-tasty" bias.

GENERAL DISCUSSION

Across three studies, using parents and children, with both within- and between-subjects measures, and using correlational and experimental designs, we find consistent evidence that emphasizing the health benefits of a food item, relative to emphasizing its taste benefits or nothing at all, decreases preschoolers' consumption (current and planned) by leading to lower taste ratings. Emphasizing health information shifts the attention from experiential, taste-related benefits to instrumental, health-related benefits. This shift makes eating an extrinsically motivated activity, which in turn undermines the experience of taste and lowers consumption among young children.

Our first study finds that although parents report using health-based arguments more often than they use taste-based arguments to convince their children to eat vegetables, the health–based arguments do not increase consumption above and beyond merely serving these vegetables, whereas taste-based arguments do. Building on this finding, our second study provides direct evidence for the failure of health-based arguments and shows that children between four and a half and five and a half years old consume less and are less likely to choose the consumed crackers when these crackers are presented as healthy, as compared to when no information is presented or the crackers are presented as tasty. These effects were not present after a two-week delay, suggesting attention to health messages, rather than knowledge about them, causes the effect on consumption and choice. In other words, children do not necessarily

believe in a general negative relationship between taste and health but attention to health benefits negatively affects their experience. Finally, our last study extends the effect on consumption to children three to four years old, showing also that emphasizing health benefits leads to the perception of food items as less tasty compared to no emphasis. Moreover, the reduced liking for the health-framed crackers mediates the effect on consumption.

Relation to Prior Research and Boundary Conditions

Prior research on intrinsic versus extrinsic motivation focused on the role of rewards, showing that rewards often undermine intrinsic motivation once removed, especially among young children (e.g., Lepper et al. 1973; but see Cooke et al. [2011], who show that rewards may not undermine consumption of a disliked food). Building on this literature, one can think of the health benefits presented in our research as rewards. Against this view, we argue our studies also presented taste benefits ("yummy" condition, study 2), which can be construed as rewards, but had no effect on consumption relative to the no-emphasis condition. Importantly, even if the health benefits formed a psychological reward, we find a decrease in consumption (i.e., lower intrinsic motivation) while the benefits are in place, and no effect when they are removed, unlike prior research that primarily found the decrease in motivation when the external rewards were removed.

Our research contributes to our understanding of how emphasizing instrumental versus experiential benefits affects motivation and overall experience. Whereas prior research compared mostly an experiential versus instrumental focus (Fishbach and Choi 2012), we show here that experiential focus behaves much like a control condition, strengthening the argument that the

focus on instrumental benefits decreases motivation, and not that experiential benefits increases motivation.

Our research adds also to the growing body of literature about the effect of marketing pitches that make health claims on consumption and enjoyment of food (Raghunathan et al. 2006; Wansink and Chandon 2006). Unlike Irmak et al. (2011), who show that healthy names (e.g., fruit chews) can increase consumption, taste ratings, and health ratings, especially among chronic dieters, we show that emphasizing health benefits actually decreases consumption and taste ratings. Presumably, this decrease occurs because children, unlike adults, rely mainly on taste when deciding what and how much to eat, due to lower self-control, desire for immediate rewards, and weak health goals. As such, they are not affected by the "guilt-reducing" mechanism these health messages provide. Our findings also differ from those of Raghunathan et al. (2006), who show that framing food as healthy (vs. unhealthy) can negatively impact adults' taste ratings. First, we present a stronger test, as we show this effect relative to control (no-frame) and taste-frame conditions while keeping the emotional aspects of all appeals equally positive. Moreover, the effect of health messages found by Raghunathan et al. (2006) could be due to the complex associations between fatty (unhealthy) food and good taste (Kahkonen and Tuorila 1999), or dieting tendencies (Irmak et al. 2011) adults may have, whereas preschoolers are unlikely to have developed and rely on these associations or to have dieting goals.

An important question arising from this research is what constitutes as healthy among young children. In this research, we used one aspect of healthy food, namely, food that makes one feel "strong and healthy and gives energy" (figure 1). Future research can look into whether other aspects of healthiness, such as "good for you" or "helps you stay in shape," also have a similar negative effect among young children. Presumably, the more complex perception of

health, which relies on actual fat and calorie content and complex implicit associations (Chandon and Wansink 2007a; Finkelstein and Fishbach 2010), develops at a later age. Therefore, among older children, who process information in a more complex manner (e.g., John 1999) acquire information differently (e.g., Peracchio 1992), and might rely less on taste when making food decision due to higher self-control, we may find different results.

Marketing Implications

To conclude, our findings contribute to the understanding of what affects young children's motivation and consumption behavior, as well as how health-related marketing affects their behavior. Our work suggests that when encouraging children to eat healthy food, focusing on the health benefits may backfire. Emphasizing the taste benefits, assuming these are credible, or even not mentioning the benefits at all, is superior to emphasizing health benefits in terms of encouraging consumption and creating a positive experience. This conclusion is consistent with Reicks et al. (2012), who find that merely placing pictures of vegetables on school lunch trays, without any accompanying messages, increased consumption of vegetables.

Marketing food as healthy may still have a positive impact on consumption among children, by influencing parents (and other caregivers) to purchase and serve this food. Parents affect children's food choices by making specific foods available, by acting as models for their children, and by adjusting their behavior in specific situations (e.g., Young, Fors, and Hayes 2004). To the extent that parents are convinced some food is healthy, they can play a crucial role in increasing their children's consumption of the healthy food, by simply serving these food items, without even attempting to convince their children to eat them. Our conclusion refers to

marketing pitches directed at the children themselves: we find that when serving food to preschoolers, it is best not to mention health benefits.

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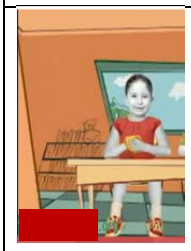
FIGURE 1:

STORIES USED IN STUDY 2 (THERE WAS NO STORY IN THE NO-FRAME, CONTROL CONDITION)

Healthy condition

This is Tara. Tara likes to eat a snack before she goes out and play.	Today Tara ate the 'Wheat Thins Crackers' for snack.	Tara felt strong and healthy, and	She had all the energy she needed to play outside.
			

Yummy condition

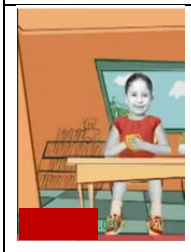
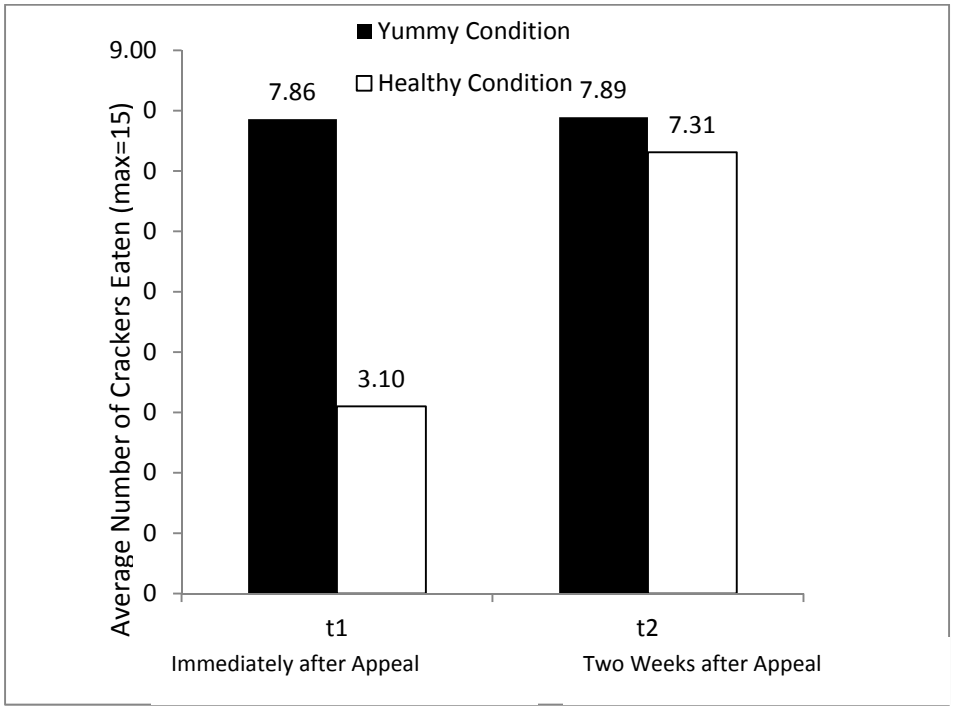
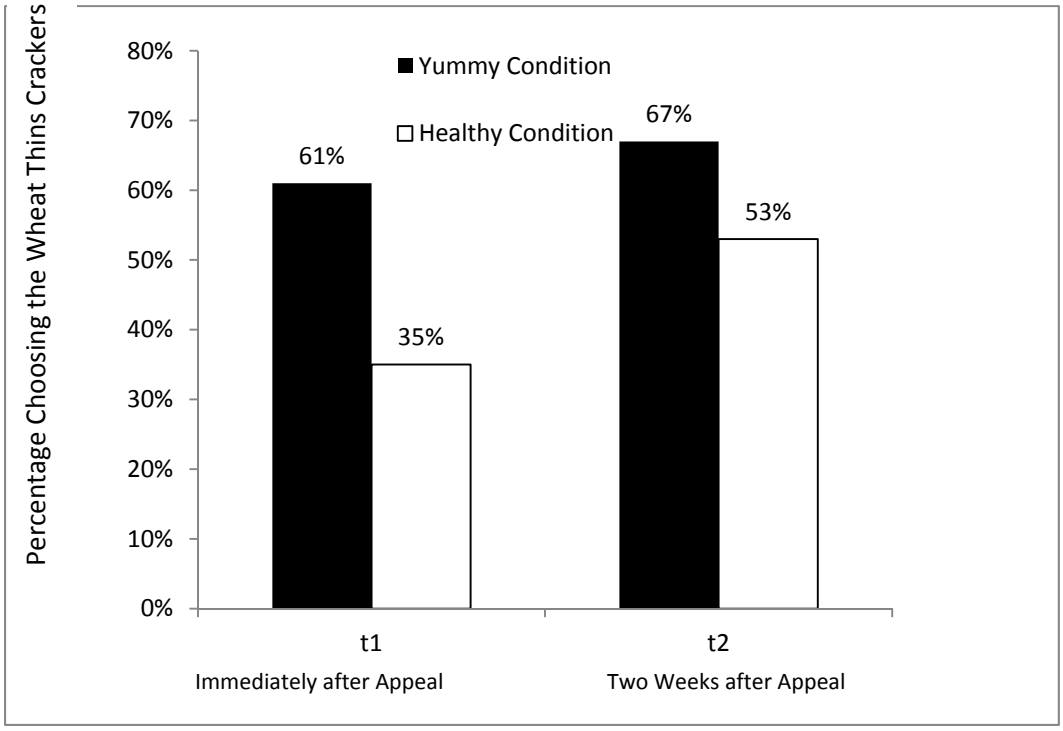
This is Tara. Tara likes to eat a snack before she goes out and play.	Today Tara ate the 'Wheat Thins Crackers' for snack.	Tara thought the crackers were yummy,	And she was happy to play outside.
			

FIGURE 2:
HEALTH FRAME DECREASES CONSUMPTION ONLY WHEN ACCESSIBLE DURING CONSUMPTION



Note: Of the 57 children who completed the first session (t_1), 35 participated in the second session (t_2), of which 17 were originally in the "healthy" condition and 18 in the "yummy" condition. Values in t_1 represent the average number of crackers eaten during the first session by children who proceeded to complete the second session.

FIGURE 3:
HEALTH FRAME DECREASES CHOICE OF WHEAT THINS CRACKERS ONLY WHEN ACCESSIBLE DURING CHOICE

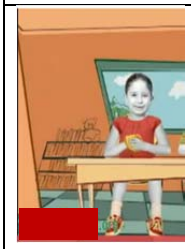


Note: Values in t_1 are based on the sub-sample who proceeded to complete the second session.

FIGURE 4:

STORIES USED IN STUDY 3

Health Condition

This is Tara. Tara likes to eat a snack before she goes out and play.	Today Tara ate the 'Wheat Thins Crackers' for snack.	Tara felt strong and healthy, and	She had all the energy she needed to play outside.
			

Control Condition

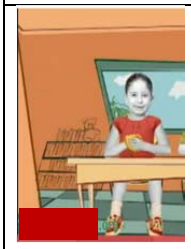
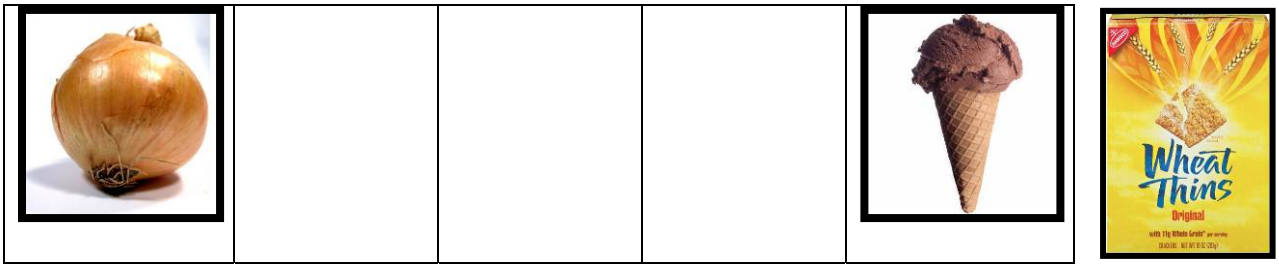
This is Tara. Tara likes to eat a snack before she goes out and play.	Today Tara ate the 'Wheat Thins Crackers' for snack	And she went to play outside.
		

FIGURE 5:

POST-EATING MEASURES USED IN STUDY 3

Smiley Scale:

Illustration of the Similarity Scale:



* Children place a card with the picture of the Wheat Thins crackers on one of the empty boxes. If they think the crackers are similar to ice cream [onion], thus indicating liking [disliking], they place the crackers next to the ice cream [onion], or in the middle if they are not sure.