ARTICLE

Influence of Licensed Spokescharacters and Health Cues on Children's Ratings of Cereal Taste

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Objective: To investigate whether licensed media spokescharacters on food packaging and nutrition cues affect young children's taste assessment of products.

Design: In this experimental study, children viewed 1 of 4 professionally created cereal boxes and tasted a "new" cereal. Manipulations included presence or absence of licensed cartoon spokescharacters on the box and healthy or sugary cereal name.

Setting: Shopping center in a large northeastern city in December 2007.

Participants: Eighty children (mean [SD] age, 5.6 [0.96] years; 53% girls) and their parents or guardians.

Main Exposure: Licensed cartoon characters and nutrition cues in the cereal name.

Outcome Measures: Children rated the cereal's taste on a 5-point smiley face scale (1, really do not like; 5, really like).

Results: Children who saw a popular media character on the box reported liking the cereal more (mean [SD], 4.70 [0.86]) than those who viewed a box with no character on it (4.16 [1.24]). Those who were told the cereal was named Healthy Bits liked the taste more (mean [SD], 4.65 [0.84]) than children who were told it was named Sugar Bits (4.22 [1.27]). Character presence was particularly influential on taste assessments for participants who were told the cereal was named Sugar Bits.

Conclusions: The use of media characters on food packaging affects children's subjective taste assessment. Messages encouraging healthy eating may resonate with young children, but the presence of licensed characters on packaging potentially overrides children's assessments of nutritional merit.

Arch Pediatr Adolesc Med. 2011;165(3):229-234

The use of trade (eg, Ronald McDonald) and licensed (eg, Shrek) spokescharacters is a popular marketing practice in child-directed products because the presence of these figures helps children identify and remember the associated product.[1-3] Because young children remember nonverbal representations more readily than verbal descriptions and typically are not yet capable or consistent readers, a visual cue, such as a friendly character or logo, helps them remember information presented in an advertisement.[4-7]

These characters also are more commonly found in child-directed marketing of food products of low nutritional quality despite a charge from the Institute of Medicine to display them only for healthful products.[8-10] Recent research indicates that appealing characters influence children's snack selections and that associating licensed characters with healthy foods can encourage healthier food choices among preschool-aged children, particularly characters that are beloved by children.[11,12]

Research findings are mixed regarding the extent to which the presence of characters alters a child's attitude toward the product. One study[13] found that children's spokescharacter recognition had a direct positive correlation with their attitude toward age-appropriate products (eg, cereal) but not "adult-only" products (eg, cigarettes). Another set of experiments[12,14,15] found that the presence of characters in advertising boosted children's attention toward, product recognition of, and liking for children's food products. However, recognition and liking of the spokescharacters are not always associated with children's product preferences or purchase intentions.[14]

Conclusiveness regarding the effect of trade and licensed characters is restricted by several general limitations in the lit-

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Figure 1. Copy of 2 of the separate cereal boxes shown to children, including side panels.

erature. Studies[13,16,17] reporting a negative relationship between the effect of characters and products on children focus on responses to trade characters associated with tobacco products. In addition, other studies[14,15] have tested children's liking of products and characters using characters that were initially unknown to the participants. Thus, many studies do not adequately simulate the ways in which children encounter these licensed and trade characters in their daily lives (eg, SpongeBob SquarePants on fruit snacks and Ronald McDonald for McDonald's restaurants).

Because of these design issues and, to our knowledge, the general scarcity of research regarding the effect of licensed characters, little is known regarding the influence of this pervasive child-targeted marketing strategy. The purpose of the present study was to experimentally investigate the influence of licensed characters on children's subjective rating of a food product (ie, cereal). In light of the recent increase in childhood overweight and obesity,[18,19] we were also interested in whether children's taste preferences are affected by packaging cues regarding the product's nutritional value. We anticipated that young children (ie, 4- to 6-year-olds) would rate the taste of a cereal more favorably if licensed spokescharacters were displayed on the box compared with a box with no characters on it, regardless of whether the name of the cereal implies that the product is healthy or sugary.

METHODS

SAMPLING AND DATA COLLECTION

After university institutional review board approval, data collection took place in a shopping center in a large northeastern city in December 2007. To recruit children to participate, adults accompanying young children were approached by the researchers. The adults were asked whether they were the parents or legal guardians of the children with them and, if so, whether the child was between the ages of 4 and 6 years. If the child was within this age range, parents or guardians were asked if they would like to participate in the study and told that compensation for their time included $5 and a sticker for the child. Before giving consent, parents or guardians were informed that their child would taste a small amount of dry cereal and would then be asked some questions about it. Children with nut or wheat gluten allergies were excluded from participation.

STIMULI

The study used a 2 × 2 between-subjects design with 4 conditions (healthy cereal name, sugary cereal name, character present, and character absent). The 4 cereal boxes were professionally produced to mimic commercially available cereal boxes (**Figure 1**). To have appeal similar to that of a standard cereal package, the baseline cereal box was designed to look similar to the no-character boxes of cereals marketed to children (eg, Kix and Frosted Mini-Wheats). The characters were then included on the front of the 2 experimental boxes. Except for the name of the cereal and the presence or absence of the characters, all other elements remained constant across the 4 boxes.

The characters used on the box were selected through a 2-step process. First, grocery stores were visited, and any character found on cereal packaging was eliminated from consideration to prevent any previous food or character association from influencing results. Second, we surveyed popular television programs, movies, and video games to select characters that would appeal to boys and girls. Six pairs of characters from well-known children's media products were identified. To make the final selection, these 6 character pairs were shown to 33 preschoolers and kindergarteners, who were asked to select their favorite. The most popular pair was Mumble and Gloria, cartoon penguin characters from the movie *Happy Feet*.

Finally, we selected a cereal for tasting that was likely to be unfamiliar to children (by sight and taste) and could convincingly pass as sugary or healthy. The chosen cereal, Cascadian Farms Organic Kids Clifford Crunch (Small Planet Foods Inc, Minneapolis, Minnesota), is sold primarily in natural food stores or upscale grocery stores, such as Whole Foods Market. It is marketed as a cereal that caters to children's tastes and is also nutritious (the nutrition panel indicates 6 g of sugar per serving, whereas Cheerios contains 1 g and Fruit Loops Marshmallow contains 16 g).

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PROCEDURES

After obtaining verbal assent from the child and written consent from the parent(s) or guardian(s), researchers assigned the child to a condition by selecting a poker chip (with the assigned group written on the chip) at random from a cloth sack. The child was then seated at a table with the investigator behind a partition so that parent(s) or guardian(s) would not influence the child's responses. The researcher then told each child that he or she would be trying a new cereal and that the researcher would like to know what the child thought about the cereal. When the child indicated that he or she was ready to begin, the researcher first made certain that the child understood the rating scale used for most of the responses. The 5-point rating scale consisted of smiley faces that displayed increasing amounts of positive affect (1, deep frown: really do not like; 5, big smile: really like). The child was asked 2 practice questions, which were designed to create diverse responses (ie, how much he or she liked ice cream or cleaning his or her room). Once it was apparent that the child understood the scale, the child was shown 1 of the 4 stimuli for the experiment (ie, the cereal box) to begin the data collection.

The researcher showed the child the cereal box and said the following: "Now I want to ask you about a cereal; it is called Sugar/Healthy Bits." The researcher made no mention of the characters (if present) on the box. Each child was then given a small cup holding a 10-g dry serving of the cereal to taste and was told that he or she could eat as much as desired. Next, the child was asked, "How much did you like the taste of the cereal?" using the previously mentioned scale. After recording the child's response, the researcher asked about the characters featured on the cereal box using a separate but identical picture of the characters. Specifically, children were asked whether they knew who the characters were, where they had seen them, and how much they liked the characters. This last set of procedures was used with all children in the study.

While children took part in the taste test, their parent(s) or guardian(s) filled out a questionnaire with another researcher. The questionnaire asked about the child's media use and consumer behaviors, as well as parent or guardian attitudes toward media use, their educational background, and their practices regarding their children's consumer development. Previous studies have documented that these variables (ie, parent's or guardian's educational level or child's media environment and use) are predictive of children's product choices.[20,21] When finished with the data collection, the children and parent(s) or guardian(s) were thanked for their participation and were given their compensation. The approximate time of completion for each entire data collection was 8 to 10 minutes.

STATISTICAL ANALYSES

All statistical analyses were performed using SPSS statistical software, version 15 (SPSS Inc, Chicago, Illinois). We used frequency tables to illustrate the sample's characteristics. Mean differences among our experimental groups were initially tested via univariate analysis of covariance; however, after discovering that none of the covariates (eg, age of child or parent's or guardian's educational level) were significantly affecting our tests, we switched to a univariate analysis of variance with a 2 (character present or absent) × 2 (Healthy Bits or Sugar Bits) factorial design. We used a Tukey honestly significant difference post hoc test to determine which subgroups within interactions were significantly different. For tests of statistical significance, $P < .05$ was considered significant.

Table. Characteristics of Children in the Sample[a]

Characteristic	Children (N=80)
Age, mean (SD), y	5.56 (1.0)
Sex	
Male	36 (45)
Female	42 (53)
No reply	2 (3)
Mother's or maternal guardian's educational level	
No high school diploma	11 (14)
High school diploma or GED	20 (25)
Some college or associate's degree	24 (30)
Four-year college degree	16 (20)
Graduate degree	5 (6)
No reply	4 (5)
Father's or paternal guardian's educational level	
No high school diploma	13 (16)
High school diploma or GED	21 (26)
Some college or associate's degree	21 (26)
Four-year college degree	10 (12)
Graduate degree	5 (6)
No reply	7 (9)
Don't know	3 (4)
Bedroom television	
Yes	45 (56)
No	31 (39)
No reply	4 (5)
Television watched per day	
None	4 (5)
<30 min	6 (8)
30 min-1 h	18 (22)
>1-2 h	20 (25)
>2-3 h	7 (9)
>3 h	15 (19)
No reply	10 (12)
Child recognized the characters	66 (82)

Abbreviation: GED, general equivalency diploma.
[a] Data are presented as number (percentage) of children unless otherwise indicated. Percentages may not total 100 because of rounding.

RESULTS

SAMPLE

Eighty 4- to 6-year-old children whose parent(s) or guardian(s) provided consent participated in this study, with 2 children excluded because of food allergies and 1 boy refusing to indicate how much he liked the cereal. Children were approximately 5.5 years old (mean [SD] age, 5.6 [0.96] years), and 53% of the sample were girls (**Table**).

TASTE OF CEREAL

There was a significant main effect for character presence on children's subjective report of taste ($F_{1,76}=6.37$, $P=.01$). Almost all children liked the cereal, but those who saw a popular media character on the box reported liking the cereal more (mean [SD], 4.70 [0.86]) than those who viewed a box without a character on it (mean [SD], 4.16 [1.24]). Neither recognition nor liking of the character influenced children's taste assessments. This may have occured because only a few of the children did not recognize the characters in the character condition (n=6)

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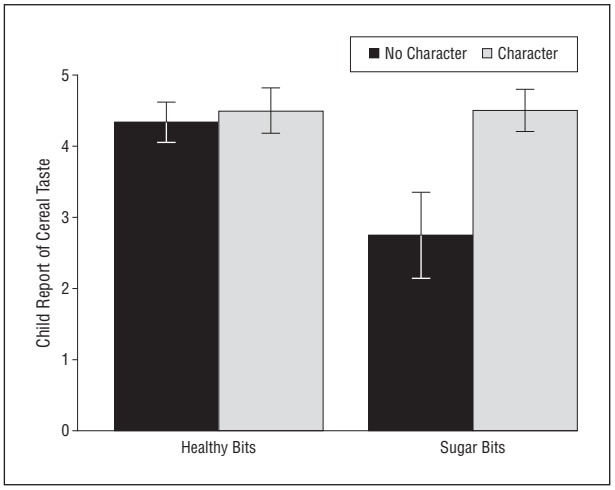

Figure 2. Mean (SD) taste assessment scores (on a scale of 1 to 5) based on character presence and cereal name.

and the characters are considered to be universally well liked (mean [SD], 4.31 [0.74]). Cereal name also had a significant effect on reported taste ($F_{1,76}$=4.35, P=.04). Children who sampled the cereal named Healthy Bits reported that they enjoyed the cereal more (mean [SD], 4.65 [0.84]) than children who were given the same cereal with the name Sugar Bits (4.22 [1.27]).

Analyses also revealed a significant interaction between the 2 factors ($F_{1,76}$=4.43, P=.04). Children who received the cereal named Sugar Bits with no character on the box reported enjoying the cereal's taste significantly less than children in each of the other 3 groups. No significant differences were found among children in the Healthy Bits group based on the presence or absence of characters (**Figure 2**). When there were characters present, children in the Sugar Bits group reported liking the cereal as much as the children who were in the Healthy Bits group.

COMMENT

The results of this experiment provide evidence that the use of popular characters on food products affects children's subjective assessment of taste. With just a brief exposure to a "new" cereal, 4- to 6-year-old children expressed higher ratings when the box featured popular characters. Children who saw characters on their cereal box reported significantly higher taste ratings than children whose box did not feature the characters. Thus, with the simple addition of popular media characters to the cereal box, children enjoyed the cereal more.

The name of the cereal also played an important role in shaping children's assessment of the product, although not in the expected direction. We believe there are 2 potential explanations for this finding. The first is that from a young age, children are commonly told that sugary foods are bad and should be avoided. As such, it is possible that children were reacting less enthusiastically to the name Sugar Bits because of these negative associations. Furthermore, we noted in our survey of cereals currently marketed to children that although many cereals use names that imply a sweet taste (eg, Honeycomb and Frosted Flakes), none included the word *sugar* in the title (the closest found was Cookie Crisp). If children were reacting less favorably to the word *sugar* in the product name (compared with the word *healthy*), it is promising that messages encouraging healthier eating habits seem to resonate with young children and disconcerting that the mere presence of a character on food packaging seems to override this judgment.

Another explanation for the difference in children's assessments of the cereal involves their expectations of the cereal taste based on the name. Specifically, the cereal used for this study had only a moderately sweet taste. Consequently, children may have been disappointed by the lack of sugary flavor in the cereal named Sugar Bits and pleasantly surprised by the sugary flavor in the cereal named Healthy Bits. At 6 g of sugar per serving, however, the sugar content was comparable to that of other commonly available sweet cereals (eg, 6 g in Honey Kix and 9 g in Honey Nut Cheerios). Nevertheless, whether the children were reacting to their expectations of the cereal's taste or expressing their skepticism of the merits of sugary products, when the character was present on the box, children reported a more favorable subjective experience with the product.

The significant interaction between cereal name and character presence sheds the greatest amount of light on the power of these characters to affect young children's assessment of food products (Figure 2). The findings suggest that the children's less enthusiastic response to the word *sugar* in the name of the cereal was overridden by the presence of the characters on the box. When the Sugar Bits cereal box did not prominently feature characters, the children in this group were able to assess the product on its apparent merits. However, with the characters present, participants appeared to assess the taste of the cereal based on their response to the characters.

Many steps were taken to ensure that reactions to the cereal were not influenced by previous exposure to nonmanipulated factors of the cereal or packaging, granting further face validity to the present study. To our knowledge, the cereal children tasted was not commonly available in conventional supermarkets, the characters we used were not already used to market other cereals, and the brand names of the "new" cereal were not in current use. In addition, the differences in the cereal boxes were limited to the experimental manipulations. The only aspects of the product that changed between participant conditions were the presence or absence of characters and the differing cereal names. Reactions to the cereal across conditions were uniform because age, parent's or guardian's educational level, media use, and reported liking of the characters were unrelated to taste ratings.

Results of this experiment complement similar studies performed by Robinson et al[20] and Roberto et al.[12] Robinson et al found that children were more likely to rate the taste of fast food products more favorably if the products were packaged such that children believed they were from a popular fast food restaurant (eg, McDonald's) rather than having unidentifiable packaging. Roberto et al found that children were more likely to respond favorably to snack foods when licensed characters were associated with the product compared with products that lacked such as-

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sociations. These studies, as well as our own, suggest that young children react powerfully to familiar advertising cues in ways that exceed simply establishing consumer preferences. Children experience these products differently based on cues on the packaging.

Our results also extend the research in an important way. Before tasting the food, the children in the study by Robinson et al were asked whether they knew which came from McDonald's, and the McDonald's products were explicitly pointed out to those children who did not know. Our findings largely mirrored their results, even when no explicit attention was called to the character before the product tasting and assessment. Furthermore, the studies by Robinson et al and Roberto et al required participants to taste 2 items (ie, 1 with familiar packaging and 1 in blank packaging) and select the better tasting of the pair. Because the children in our study were exposed to only 1 box and 1 version of cereal, these results add confidence to the general conclusion that children prefer products with appealing characters and logos even in the absence of a forced-choice situation between familiar and novel products.

Our results have direct implications for policy regarding marketing to children. The use of popular children's characters in marketing communication has the potential to unduly influence the purchasing decisions of children. Moreover, not only do appealing and familiar trade and licensed characters manipulate young children's subjective judgments, the resulting heightened preference for food products featuring these characters is likely to contribute to unhealthy eating habits[3,21] and increased materialism and parent-child conflict.[22,23]

Further studies are needed to determine the extent of licensed character influence on a broader age range of children and to see whether there are individual differences that might moderate effects, as well as the ramifications for children's eating behaviors. Unfortunately, parents and guardians in this study were not asked about children's race/ethnicity and weight status. It would be worthwhile to examine whether weight status influences children's reactions to marketing cues or whether there are differences among various racial/ethnic groups. It is uncertain whether overweight and obese children might react differently, particularly in regard to the healthy and sugary packaging cues. Recent studies[24,25] have shown that overweight children are more brand conscious than children who are not overweight, although it is unclear whether this increased brand consciousness leads to actual changes in dietary behavior with overweight children when exposed to commercial messages.[25-27] Prior research has indicated that socioeconomic status and media use influence children's reactions to product marketing, although race and ethnicity do not.[20,22] Further research on this subject is certainly needed, however. Interestingly, none of the other moderators for which we tested had an effect on children's taste ratings in this study, even those that have been found in previous research on children and advertising.[20,22,23]

Earlier research indicated that differences in older children's (ie, 7- to 11-year-olds) brand preferences depended on whether they experienced the product before or after viewing an associated advertisement.[28] Future studies with young children should manipulate the order of tasting the product and viewing the packaging to explore the possibility that expectations may similarly affect young children's assessments.

Great care was taken in this study to make the boxes with and without characters resemble the packaging of commercially available cereals popular with children so that potential differences would not be driven by the mere presence of *anything* appealing on the box. Still, it is possible that children who saw a box with no characters found the packaging "boring," which could explain the observed effects. Future research should use additional stimuli (ie, different characters and designs) to confirm the influence of licensed characters broadly.

We believe this study represents an important step in our understanding of the effects of marketing practices on young children and points to crucial avenues for future research. With increased information regarding the nature of the influence of marketing techniques, policymakers can encourage more appropriate means of child-directed food marketing so that parents or guardians and pediatricians can determine how best to teach children media literacy skills and healthy eating behaviors.

Accepted for Publication: July 29, 2010.
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Author Contributions: Mr Lapierre and Ms Vaala, who contributed equally to this project and whose authorship order was determined by coin flip, had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Lapierre, Vaala, and Linebarger. *Acquisition of data:* Lapierre and Vaala. *Analysis and interpretation of data:* Lapierre and Vaala. *Drafting of the manuscript:* Lapierre and Vaala. *Critical revision of the manuscript for important intellectual content:* Lapierre, Vaala, and Linebarger. *Statistical analysis:* Lapierre. *Obtained funding:* Lapierre and Linebarger. *Administrative, technical, and material support:* Lapierre, Vaala, and Linebarger. *Study supervision:* Lapierre, Vaala, and Linebarger.
Financial Disclosure: None reported.
Additional Information: Special thanks to Amy Jordan, PhD, and Robert Hornik, PhD, for their assistance with this project.

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