RESEARCH
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The Impact of Toddler Milk Claims on Beliefs and Misperceptions: A Randomized Experiment with Parents of Young Children

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ABSTRACT

Background Toddler milk (ie, a nutrient-fortified milk-based drink marketed for children aged 12 to 36 months) has been marketed increasingly in the United States with structure/function claims on product packaging that are potentially misleading.

Objective This study examined how structure/function claims impact parents' beliefs and perceptions about a toddler milk product.

Design This was a 3-arm between-subjects randomized experiment.

Participants A diverse sample of 2,190 US parents of children aged 1 to 5 years were chosen to take an online survey.

Intervention Participants were randomly assigned to view a toddler milk package with either an unrelated claim ("new and improved," ie, control condition), a "brain development" claim (ie, "brain" claim), or an "immunity-related" claim (ie, "immunity" claim).

Main outcome measures Outcomes included perceptions, intentions, and beliefs about the toddler milk product.

Statistical analyses performed Linear regression for continuous outcomes and logistic regression for dichotomous outcomes.

Results Parents who were exposed to the "brain" claim or the "immunity" claim were more likely to incorrectly believe that the toddler milk was as healthy or healthier than cow's milk compared with those who saw the control claim (89% for brain claim, 87% for immunity claim, and 79% for control; $P < .001$ for both comparisons). Parents exposed to either the brain or immunity claim had higher intentions to give the toddler milk to their child, higher perceived product healthfulness, and stronger beliefs that pediatricians would recommend the product compared with parents exposed to the control (all, $P < .001$).

Conclusions These findings suggest that structure/function claims on toddler milk packaging may mislead parents and increase the appeal of toddler milk. Our findings support calls for public health policies to regulate marketing on toddler milk packaging.
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THE FIRST 1,000 DAYS OF LIFE ARE CRITICAL IN shaping long-term development and health. It is during this period that children develop eating habits and food preferences.[1] The World Health Organization (WHO), public health and medical associations, and the 2020-2025 Dietary Guidelines for Americans advise parents not to feed children younger than 2 years foods with added sugar[2-5] because it can negatively impact children's food preferences.[3] Yet, the formula industry has introduced a category of toddler drinks, also known as "growing-up milk," (hereafter referred to as "toddler milk") that are marketed as beneficial for young children aged between 12 and 36 months, although they are not recommended by child health experts.[6] In addition, toddler milk is considered a commercial breast milk substitute that should not be marketed directly to consumers, under the WHO's International Code of marketing of breast-milk substitutes.[7] Toddler milk is composed predominantly of nonfat cow's milk, vegetable oils, and corn syrup solids or other sweeteners, and it contains more sodium and less protein than cow's milk.[6,8,9] It also provides no unique nutritional value compared to a healthy diet with a variety of adequate, safe, and nutrient-dense foods, and tends to cost more than cow's milk.[6] Despite the potentially deleterious effects for children's health, toddler milk sales are growing rapidly[7,10] and toddler milk is the fastest growing category of breast milk substitute in the United States.[11]

Common labeling practices on children's beverage packages can confuse consumers and make it difficult for parents to select more nutritious products and identify ingredients,

such as added sugars and non-nutritive sweeteners.[12,13] Food companies have been heavily marketing toddler milk products in the past 10 years using structure/function claims on product packaging.[6,11] Structure/function claims describe how an ingredient or nutrient affects the structure or function of the human body (hereafter referred to as structure/function claims).[14] On toddler milk packaging, despite no scientific evidence to support their accuracy,[15-17] these claims often state benefits for toddlers' nutrition, mental performance, and growth.[6,10]

Although the US Food and Drug Administration created a guidance document for structure/function claims on infant formula, such guidance did not apply to toddler milks.[10] Therefore, unproven claims on toddler milk packaging and other drinks for young children are widespread and could mislead parents by giving false information about the association of the product with health-related benefits.[18] In addition, just the presence of health and nutrition-related claims can be problematic if they cause parents to believe toddler milks are healthier for their children than they are, because parents might overestimate the healthfulness of a product based on a single claim, a phenomenon known as the "health halo effect."[19,20]

A body of literature has demonstrated how claims impact consumers' overall perception of food products and beverages,[21-23] however, there is limited evidence on toddler milk.[24,25] Studies have found that parents generally have positive perceptions about toddler milk in response to claims,[26] but the impact of toddler milk claims on perceptions has not been examined experimentally. Therefore, this study examines how structure/function claims influence beliefs and perceptions of a toddler milk product in an experiment with US parents of young children. The goal of the study was to determine the impact of claims on parents' intention to serve and perceived healthfulness of toddler milk, with the long-term objective of better informing public health authorities to develop policies to regulate structure/function claims on toddler milk.

RESEARCH SNAPSHOT

Research Question: Do claims on toddler milk packaging influence parents' perceptions and reactions to toddler milk?

Key Findings: This experiment found that parents exposed to structure/function claims about brain development and immunity were more likely to incorrectly believe that a toddler milk product was as healthy or healthier than cow's milk than those who saw the control claim (all, $P < .001$). Both claims led parents to have higher intentions to give a toddler milk product to their child, and stronger beliefs that pediatricians would recommend the toddler milk product than participants who viewed the control (all, $P < .001$).

MATERIALS AND METHODS

Participants

A sample of 2,218 US adults (aged 18 years or older) was recruited between May and July 2020 through 2 online panel research companies (Kantar and CloudResearch's Prime Panels). Participants were parents of children between the ages of 1 and 5 years, recruited for a parent study consisting of a virtual shopping experiment examining the impact of front-of-package claims on fruit-flavored drinks with added sugar (these results will be reported in a forthcoming article). Participants answered questions about the present study in a survey after the shopping task, which we will describe.

Procedures

After completing an eligibility screener, all participants provided written informed consent. As part of the virtual shopping experiment, participants completed a shopping task in a virtual store,[27] where they were asked to select 2 beverages and 1 granola bar for their child. After completing the shopping task, participants were directed to complete an online survey programmed through Qualtrics survey software.[28] During the survey, participants were instructed that the following questions would be "about a drink for toddlers (children ages 12-36 months)," and randomly assigned to view a toddler milk package with either a neutral claim that read "new and improved" (ie, control condition) or 1 of the following 2 structure/function claims: "supports brain development omega-3 DHA" [docosahexaenoic acid (ie, "brain" claim)] or "immune health dual prebiotics and vitamins (ie, "immunity" claim)." A professional designer created the toddler milk package image, using an international brand that would likely not be familiar to US consumers (Figure 1). The 2 claims were selected based on a review of the most frequent claims displayed on toddler milk packages for sale in the United States and in consultation with legal experts in the field of beverage claim regulation.[29] Participants received incentives in cash, gift cards, or reward points from the panel companies in appreciation of their time. The University of North Carolina Institutional Review Board approved the study. Before data collection, we preregistered the study on AsPredicted.org (https://aspredicted.org/blind.php?x=y7289e).

Measures

After viewing their randomly assigned toddler milk image, parents answered questions about toddler milk perceptions and attitudes. The survey assessed 6 outcomes. The first, misperception that the toddler milk product is healthier than plain cow's milk, was adapted from Brewer and colleagues,[30] and was measured as "Compared to plain milk, this product is ... ?" with responses ranging from "much less healthy" to "much healthier". The second, intention to give it to a toddler, was adapted from Roberto and colleagues,[31] and asked as "How likely would you be to give this product to a toddler?" with responses ranging from "not at all likely" to "extremely likely." The third, perceived healthfulness of the toddler milk, was adapted from Bollard and colleagues,[32] and measured as "How healthy would it be for a toddler to drink this product

Figure 1. Experimental labels in toddler milk packages used in the study (control claim, "brain" claim, and "immunity" claim). DHA, docosahexaenoic acid. Note: Full experimental labels images are available on request from the authors.

every day?" with responses ranging from "Very unhealthy" to "Very healthy." The fourth, perceived pediatrician approval of the product was measured as "Pediatricians would recommend this product for most toddlers" with responses ranging from "strongly disagree" to "strongly agree." The fifth, perceived brain development–related benefits, was adapted from Romo-Palafox and colleagues[33] and measured as "This product could help make toddlers smarter," with responses ranging from "strongly disagree" to "strongly agree". The sixth, perceived immunity-related benefits was adapted from Romo-Palafox and colleagues[33] and measured as "This product keep toddlers from getting sick as often," with responses ranging from "strongly disagree" to "strongly agree." Response scales for all items were Likert-type scales ranging from 1 (low) to 7 (high). For misperception that the toddler milk is healthier than plain cow's milk, we dichotomized into incorrectly and not incorrectly believe that toddler milk is healthier than plain cow's milk. In addition, the survey measured standard demographics, including age (18 to 29 years, 30 to 39 years, 40 to 54 years, and 55 years or older), gender identity (man, woman, and transgender or other gender identity), education (less than high school diploma, high school diploma, 4-year college degree, and graduate degree), employment status (employed part-time, full-time, unemployed or other), household annual income ($0 to $24,999, $25,000 to $49,999, $50,000 to $74,999, and $75,000+), use of Supplemental Nutrition Assistance Program (in the last year), body mass index (underweight, normal weight, overweight, and obese), ever served toddler milk, and have ever served toddler milk to a child (younger than 9 months, 9 to 12 months, 13 to 24 months, 25 to 36 months, and 27 months and older). Race was measured using racial self-classification based on 6 closed-ended options from the 2020 US Census[34]: White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and some other race. Latino ethnicity was measured and categorized as a dichotomous variable using the 2020 US Census measure. Race and Latino ethnicity in our analyses are not indicators of biological differences, but are representations of the sociopolitical processes that differentially impact individuals based on race and ethnicity. Exact item wording for survey measures appears in Figure 2 (available at www.jandonline.org).

Data Analysis

Analyses used Stata/SE, version 15.1[35] with 2-tailed tests and a critical α of .05. The analytic sample includes participants from the main study with data on at least 1 of the toddler milk-related outcomes (n = 2,190). Chi-square tests for the categorical variables and analysis of variance for continuous variables were used to examine whether randomization created equivalent groups. Because employment status (P = .001), use of Supplemental Nutrition Assistance Program in the last year (p = .025), and body mass index (p = .032) were not equally distributed across study arms, a sensitivity analysis was conducted to assess the analyses with and without adjustment for these baseline characteristics (Table 1; available at www.jandonline.org). Unadjusted analyses revealed an identical pattern of findings in terms of direction of effects and statistical significance compared to the adjusted findings. Hence, only the unadjusted findings were reported, following the Consolidated Standards of Reporting Trials guidelines for randomized trials[36] and our preregistered analytic plan. Misperception that toddler milk is as healthy or healthier than plain cow's milk was dichotomized. All other variables were treated as continuous. Linear regression was used for continuous outcomes and logistic regression for the dichotomous outcome, with study arm specified as a set of dummy variables indicating whether the participant was randomized to either claim condition compared with the control. Skewness of the residuals was examined using Shapiro-Wilk test. Sensitivity analyses used ordered logistic regression for outcomes with skewed residuals. Linear models were retained because the pattern of results did not change in terms of direction of effect and statistical significance. Effect sizes comparing each of the experiment arms to the control for each outcome were calculated using Cohen's d.[37] Then, moderation effect on the impact of the experimental arm on toddler milk's perceived healthfulness by demographic characteristics was examined in exploratory analyses. Separate models interacting race, ethnicity, low educational attainment (less than high school and high school diploma) and ever served toddler milk were run with the experimental arm and examined the statistical significance of the interaction term of each model. Focus on these variables as potential moderators to understand the potential impact of toddler milk claims on disparities in diet and child feeding behavior are based on studies that have found differences in parents' perceptions of toddler milk by parental level of education and Latino ethnicity.[38-40] Statistically significant interactions were probed by calculating means at different levels of the moderating factor.

RESULTS

Demographic Characteristics

Most study participants were women (65%), 44% had a college degree, and 33% had annual household income less than $50,000. Approximately 33% of participants identified as Latino/a and 21% identified as Black. Forty percent had served toddler milk to their child. Among those, 49% reported having served toddler milk to a child aged 9 to 12 months, 68% reported having served toddler milk to a child aged 13 to 24 months old, and 54% reported having served toddler milk to children aged 25 to 36 months (Table 2).

Toddler Milk Perceptions and Attitudes

Participants exposed to the brain claim and the immunity claim were more likely to incorrectly believe that the toddler milk was as healthy or healthier than cow's milk than those who saw the control claim (89%, Cohen's d = 0.28 for brain claim, 87%, Cohen's d = 0.20 for immunity claim and 79% for control; P < .001 for both comparisons; Table 3). Both the brain claim and immunity claim led parents to have higher intentions to give toddler milk to their child compared with control (mean = 4.20 and Cohen's d = 0.22 for brain claim, mean = 4.13 and Cohen's d = 0.18 for immunity claim, and mean = 3.78 for control; P < .001 for both comparisons). Participants who viewed the brain claim and the immunity claim had greater perceptions of toddler milk healthfulness than participants who viewed the control (mean = 5.09 and Cohen's d = 0.24 for brain claim, mean = 5.07 and Cohen's d = 0.22 for immunity claim, and mean = 4.76 for control; P <

Table 2. Demographic characteristics of parents participating in the experimental study (n = 2,190)

Characteristic	Data[a]
Age group, n (%)	
18 to 29 y	532 (24)
30 to 39 y	1,159 (53)
40 to 54 y	448 (21)
55+ y	51 (2)
Age, y, mean (SD[b])	35 (8)
Gender, n (%)	
Man	768 (35)
Woman	1,402 (65)
Transgender or other gender identity	1 (0)
Sexual orientation, n (%)	
Straight or heterosexual	1,997 (92)
Gay or lesbian	32 (1)
Bisexual	129 (6)
Another sexual orientation	12 (1)
Latino ethnicity, n (%)	729 (33)
Race, n (%)	
White	1,553 (71)
Black or African American	463 (21)
Other/multiracial	174 (8)
Education, n (%)	
Less than a high school diploma	25 (1)
High school diploma	718 (33)
4-year college degree	956 (44)
Graduate degree	472 (22)
Employment status, n (%)	
Employed part-time	433 (20)
Employed full-time	1,212 (56)
Unemployed (able to work)	424 (19)
Other	102 (5)
Annual household income, n (%)	
$0 to $24,999	254 (12)
$25,000 to $49,999	459 (21)
$50,000 to $74,999	460 (21)
$75,000+	990 (46)
No. of children in household (aged 0 to 18 y), n (%)	
1	827 (38)
2	799 (37)
3	355 (16)
4 or more	186 (9)
	(continued)

Table 2. Demographic characteristics of parents participating in the experimental study (n = 2,190) (*continued*)

Characteristic	Data[a]
Used SNAP[c] in the last year, n (%)	445 (21)
Used WIC[d] in the last year, n (%)	293 (14)
BMI,[ef] n (%)	
<18.5	100 (5)
18.5 to 24.9	894 (42)
25.0 to 29.9	576 (27)
>29.9	565 (26)
BMI, mean (SD)	27 (8)
Ever served toddler milk, n (%)	859 (40)
Have ever served toddler milk to a child,[f] n (%)	
Younger than 9 mo	306 (36)
9 to 12 mo	417 (49)
13 to 24 mo	579 (68)
25 to 36 mo	466 (54)
37 mo and older	321 (38)
Study arm, n (%)	
Control	731 (33)
Brain claim	733 (33)
Immunity claim	726 (33)

[a]Missing data ranged from 0% to 0.32%.
[b]SD = standard deviation.
[c]SNAP = Supplemental Nutrition Assistance Program.
[d]WIC = Special Supplemental Program for Women, Infants, and Children.
[e]BMI = body mass index; calculated as kg/m^2.
[f]Categories are not mutually exclusive.

.001 for both comparisons). Both brain and immunity claims led participants to have stronger beliefs that pediatricians would recommend toddler milk compared with participants who saw the control claim (mean = 5.09 and d = 0.24 for brain claim, mean = 5.06 and d = 0.24 for immunity claim and mean = 4.76 for control; $P < .001$ for both comparisons). Participants exposed to the brain claim had stronger beliefs that the toddler milk would make toddlers smarter (mean = 4.59 and Cohen's d = 0.26 for brain claim, mean = 4.16 for control claim; $P < .001$), but when exposed to the immunity claim, the association was not statistically significant (P = .072). However, participants exposed to both brain and immunity claims believed that the toddler milk would prevent toddlers from getting sick compared with the control (mean = 4.56, Cohen's d = 0.16; P = .003 for brain claim, mean = 4.93, Cohen's d = 0.39; $P < .001$ for immunity claim, and mean = 4.33 for control).

Moderation Effects

Race, ethnicity, educational attainment, and having served toddler milk were tested as potential moderators in the relationship between the exposure to the brain or immunity

Table 3. Impact of claims on perceptions about toddler milk among parents of young children in a randomized experiment (n = 2,190)[a]

Variable	Control (n = 729)	Brain Claim (n = 733)			Immunity Claim (n = 728)		
		% (n)	*P* value[b]	Cohen's *d*[b]	% (n)	*P* value[b]	Cohen's *d*[b]
Incorrectly believe toddler milk is as healthy or healthier than cow's milk	79 (576)	89 (652)	<.001	0.28	87 (633)	<.001	0.20
	Mean (SD[c])	Mean (SD)	*P* value[b]	Cohen's *d*[b]	Mean (SD)	*P* value[b]	Cohen's *d*[b]
Intention to give toddler milk to their child	3.78 (1.98)	4.20 (1.91)	<.001	0.22	4.13 (1.92)	<.001	0.18
Perceived healthfulness of toddler milk	4.76 (1.44)	5.09 (1.37)	<.001	0.24	5.07 (1.43)	<.001	0.22
Belief that pediatrician would recommend toddler milk	4.76 (1.45)	5.09 (1.37)	<.001	0.24	5.06 (1.41)	<.001	0.24
Belief that product would make toddlers smarter	4.16 (1.67)	4.59 (1.58)	<.001	0.26	4.32 (1.69)	.072	0.09
Belief that product would prevent toddlers from getting sick	4.33 (1.58)	4.56 (1.42)	0.003	0.16	4.93 (1.47)	<.001	0.39

[a]Missing data ranged from 0% to 0.32%. Continuous outcomes ranged from 1 (low) to 7 (high).
[b]*P* values and Cohen's *d* represent comparison of each claim vs control.
[c]SD = standard deviation.

claims on perceived healthfulness of toddler milk. The interaction between Latino ethnicity and the brain claim on perceived product healthfulness of toddler milk was statistically significant (interaction $P = .04$, Figure 3), such that the impact of the brain claim on increasing perceived product healthfulness was not as strong for Latinos compared with non-Latinos. There was no interaction between ethnicity and the immunity claim on perceived product healthfulness ($P = .093$). Other demographic factors did not moderate the impact of either claim on perceived product healthfulness (all, $P > .05$).

DISCUSSION

This study experimentally examined the effects of structure/function claims for a toddler milk product that participants were likely unfamiliar with (ie, not sold in the United States) among a diverse sample of US parents of young children. Parents exposed to a claim about brain development (brain claim) or to a claim about immunity benefits (immunity claim) had higher intentions of serving the toddler milk to their children compared with parents who did not view a claim. The results also showed that exposure to claims on the toddler milk increased parents' general perceived healthfulness of the toddler milk product. Parents who were exposed to either the brain or the immunity claims were more likely to believe that the toddler milk product would be recommended by pediatricians, which is contrary to medical associations and nutrition organizations' recommendations of avoiding sugar-sweetened beverages and prioritizing fresh foods and minimally processed foods in a young child's diet.[41,42] It is worth noting that the observed effect sizes were relatively small. The small effect sizes could potentially be due to the brief exposure to claims, the influence of existing marketing efforts, prior exposure to toddler milk claims in the real world, or the strength of pre-existing beliefs about toddler milk healthfulness. Future studies should examine whether these findings hold in nationally representative

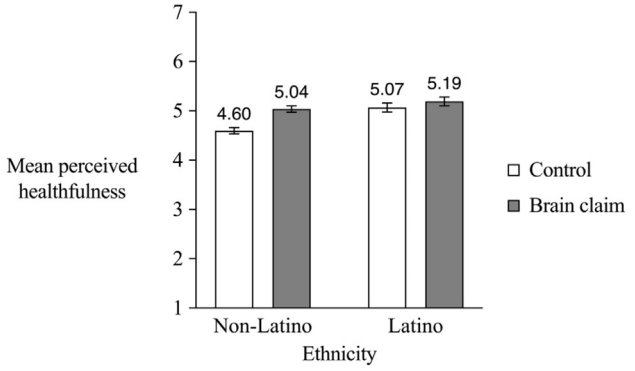

Figure 3. Impact of a toddler milk "brain" claim on perceived healthfulness in an experiment with Latino and non-Latino parents of young children (interaction P = .04) (n = 2,190). Note: Values range from 1 (very unhealthy) to 7 (very healthy). Brain claim read: "Supports brain development omega-3 DHA." DHA, docosahexaenoic acid.

samples and explore parents' beliefs in qualitative studies, including diving more deeply into the role of exposure to other channels of toddler milk marketing, as well as how social norms and marketing may influence parents' toddler feeding practices.

In addition, the exposure to the brain claim increased parents' perceptions that the product would make toddlers smarter. Similarly, the immunity claim increased parents' belief that the toddler milk product would prevent toddlers from getting sick. Exposure to the brain claim led participants to believe that toddler milk would prevent children from getting sick, which is a demonstration of the health halo effect. This effect refers to overestimating the overall healthfulness of a product based on a claim about a single quality,[19,20,43] a finding that has been demonstrated in other experiments on nutrition and tobacco claims as well.[44,45] This study also found that exposure to the brain and immunity claims increased the likelihood of incorrectly believing that toddler milk was as healthy or healthier than cow's milk. Taken together, these findings build on prior studies suggesting that claims on toddler milk packaging can lead to misperceptions and influence parents perceived healthfulness of the product.[18,39]

The impact of the brain claim on perceived product healthfulness was moderated by Latino ethnicity, such that the brain claim's impact on healthfulness was smaller among Latino parents than non-Latino parents. When the pattern of results was probed, perceived healthfulness was higher among Latinos in the control group than among non-Latinos, suggesting the claims had less "room" to change perceptions among Latinos who already thought toddler milks were healthier, even when not exposed to a claim. Previous research has shown that marketing of toddler milk is disproportionately targeted to the Latino population on Spanish-language television[6] and that Latinos caregivers are more likely to have ever purchased toddler milk compared with non-Latino caregivers.[39,40] One possible explanation for our findings is that because Latino parents are heavily exposed to toddler milk marketing, they already perceived higher product healthfulness even in the control group. Future studies should examine whether this finding holds in other samples and explore parents' healthfulness perceptions by ethnicity more deeply in qualitative studies. Having ever served toddler milk was also tested as a moderator on the impact of the brain claim and the immunity claim on perceived product healthfulness. The null findings for this moderation analysis may be a result of the fact that participants in our study likely had no precedent beliefs and attitudes about the toddler milk product's healthfulness because we used a non-US brand.

Strengths and Limitations

The strengths of this study include the diverse sample of parents of young children. The inclusion of neutral text in the control arm to account for addition of text, and the randomized design, minimized confounding factors and allowed for the establishment of a cause-and-effect relationship. In addition, the use of an unfamiliar product (not a US-based toddler milk) might have helped to isolate our effects to the structure/function claims because participants were unlikely to hold preexisting attitudes about the product. One limitation is that this study used a convenience sample that does not perfectly mirror the demographic composition of the general US population, so it is not possible to generalize the results of this study to the population as a whole. However, online convenience samples tend to provide valid results for experiments, accurately estimating the impact of manipulated variables.[46-48] Other limitations are that the study used a brief exposure to the study experimental labels on a computer screen and assessed nonbehavioral outcomes using self-report, and that participants may have confused toddler milk with infant formula, potentially leading to measurement error. Future studies should examine the effects of claims in naturalistic settings using objective outcomes, such as purchasing or consumption behavior.

Implications

The findings of this study and others[10,18,26,33,39,40] support the need for stronger regulations of toddler milk labels by governments to protect public health and consumers' well-being. The results have shown that claims lead consumers to believe that toddler milk is healthy, when in reality this belief is not supported by scientific evidence.[10] The World Health Assembly Resolution 69.9, adopted in 2016, called for the ending of inappropriate promotion of commercial products for infants and young children, including toddler milk.[49] However, in the vast majority of countries, including the United States, the promotion of toddler milk is permitted, and food companies have exploited this regulatory gap. Between 2006 and 2015, advertising expenditures on toddler milk increased 4-fold in the United States, and the sales volumes increased 2.6-fold concomitantly with a decrease in sales and advertising spending of formula.[11] Toddler milk labels that are "clear, transparent, and accurate"[10] would likely reduce misconceptions among consumers. This study suggests a need for stronger regulations to reduce inaccurate perceptions about toddler milks among parents. The US Food and Drug Administration should apply and build on existing regulations and guidance documents for infant formula and consult WHO recommendations for appropriate labeling requirements for toddler milks. In the meantime, public health stakeholders should encourage food companies to end improper labeling practices to support parent's decision

making based on reliable and accurate information when choosing food products for their children. In addition, public health stakeholders can engage in mass media campaigns to correct misperceptions about the healthfulness of toddler milks and that they are not recommended by health or nutrition experts.[50]

CONCLUSIONS

This study found that 2 structure/function claims on a toddler milk package increased parents' misperception that a toddler milk product is as healthy or healthier than cows' milk and increased their intentions to serve the toddler milk product to their child. In addition, it was also found that the presence of both claims on the toddler milk package made parents believe that the toddler milk is healthful, that pediatricians would recommend the product, and that one of the claims had a smaller impact on non-Latino parents' perceived healthfulness compared to Latino parents. Together these findings suggest that policy makers should regulate claims on toddler milk packaging to prevent misperceptions among parents.

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Item	Response scale
The next questions will ask you about the product below, which is a drink for toddlers (children aged 12 to 36 months). [display 1 image, per their randomly assigned condition]	
"Compared to plain milk, this product is ...?"[a]	1 = Much less healthy 2 = Less healthy 3 = A little less healthy 4 = Equally healthy 5 = A little more healthy 6 = Healthier 7 = Much healthier
"How likely would you be to give this product to a toddler?[b]	1 = Not at all likely 2 = A little likely 3 = Somewhat likely 4 = Fairly likely 5 = Likely 6 = Very likely 7 = Extremely likely
"How healthy would it be for a toddler to drink this product every day?"[c]	1 = Very unhealthy 2 = Unhealthy 3 = Somewhat unhealthy 4 = Neither healthy nor unhealthy 5 = Somewhat healthy 6 = Healthy 7 = Very healthy
"Pediatricians would recommend this product for most toddlers" (new item)	1 = Strongly disagree 2 = Disagree 3 = Somewhat disagree 4 = Neither agree nor disagree 5 = Somewhat agree 6 = Agree 7 = Strongly agree
"This product could help make toddlers smarter."[d]	1 = Strongly disagree 2 = Disagree 3 = Somewhat disagree 4 = Neither agree nor disagree 5 = Somewhat agree 6 = Agree 7 = Strongly agree
"This product keeps toddlers from getting sick as often."[e]	1 = Strongly disagree 2 = Disagree 3 = Somewhat disagree 4 = Neither agree nor disagree

(continued on next page)

Figure 2. Survey measures used in the toddler milk experiment.

Item	Response scale
	5 = Somewhat agree 6 = Agree 7 = Strongly agree
[a]Adapted from Brewer and colleagues.[30]	
[b]Adapted from Roberto and colleagues.[31]	
[c]Adapted from Bollard and colleagues.[32]	
[d]Adapted from Romo-Palafox and colleagues.[33]	
[e]Adapted from Romo-Palafox and colleagues.[33]	

Figure 2. *(continued)* Survey measures used in the toddler milk experiment.

Table 1. Results of unadjusted regression and adjusted regression by employment status, use of Supplemental Nutrition Assistance Program in the last year and body mass index

	Unadjusted Regression						Adjusted Regression					
	Brain Claim			Immunity Claim			Brain Claim			Immunity Claim		
Variable	β[a]	SD[b]	*P* value	β	SD	*P* value	β	SD	*P* value	β	SD	*P* value
Incorrectly believe toddler milk is as healthy or healthier than cow's milk (odds ratio)	2.17	0.32	<.001	1.72	0.24	<.001	2.16	0.33	<.001	1.70	0.24	<.001
Intention to give toddler milk to their child	0.42	0.10	<.001	0.35	0.10	0.001	0.41	0.10	<.001	0.31	0.10	0.002
Perceived healthfulness of toddler milk	0.33	0.07	<.001	0.31	0.07	<.001	0.33	0.07	<.001	0.29	0.07	<.001
Belief that pediatrician would recommend toddler milk	0.34	0.07	<.001	0.30	0.07	<.001	0.34	0.07	<.001	0.30	0.07	<.001
Belief that product would make toddlers smarter	0.43	0.09	<.001	0.15	0.09	0.075	0.42	0.09	<.001	0.15	0.09	0.089
Belief that product would prevent toddlers from getting sick	0.24	0.08	0.003	0.60	0.08	<.001	0.25	0.08	0.002	0.59	0.08	<.001

[a] β = correlation coefficient.
[b] SD = standard deviation.