

ORIGINAL ARTICLE

Effects of licensed characters on children's taste and snack preferences in Guatemala, a low/middle income country

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BACKGROUND: Marketing of high-energy, low-nutrient foods is one of the contributing factors to the obesity-promoting environment. Licensed characters are typically used to market these foods to children because they increase brand recognition and sales, and data suggest that they affect the taste and snack preferences of children in high-income countries, but it has not yet been explored in low/middle income countries (LMICs). We sought to examine how licensed characters on food packaging influence children's taste and snack preferences in Guatemala, a LMIC.

METHODS: One hundred twenty-one children (mean $\pm$ s.d. age, 7.4 ± 1.9 years) from four (two preschool and two elementary) public schools in Guatemala tasted three food types: potato chips, crackers and carrots. Each was presented in two identical packages, except that one had a licensed character and the other did not. Children tasted the foods (six total) in each package and answered whether they tasted the same or one tasted better. Snack preference was also evaluated.

RESULTS: Children were significantly ($P < 0.001$) more likely to prefer the taste of the foods inside the package with the licensed character compared with the one with no character (mean $\pm$ s.d., 0.24 ± 0.54). Most (66%) chose the food in the package with the character for a snack. Younger children ($P < 0.001$) were more likely to prefer the taste of the food inside the package with the character.

CONCLUSIONS: Licensed characters on food packaging influence Guatemalan children's taste and snack preferences. Given that these characters are typically used to promote high-energy, low-nutrient foods, their influence could contribute toward overconsumption of these foods and consequently increased risk of obesity in Guatemalan children. Therefore, public health advocates, in Guatemala and elsewhere, might explore restricting the use of licensed characters on food packaging as a public health strategy.

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INTRODUCTION

Childhood obesity is a public health concern increasingly affecting low/middle income countries (LMICs). Although the prevalence of overweight and obesity in high-income countries is almost twice than in LMICs (11.7% and 6.1%, respectively), 81% (35 million) of affected children live in LMICs. Furthermore, the relative increase in the past two decades has been higher in LMICs (65%) than in high-income countries (48%).¹

Marketing of high-energy, low-nutrient foods is one of the major contributing factors to the obesity-promoting environment surrounding children.^{2,3} Food marketing generates positive attitudes toward products and promotes consumption.^{4–6} It also influences children's food preferences and purchase requests.^{7,8} Concerns that the marketing of high-energy, low-nutrient foods are encouraging children to overconsume them, have led some countries (for example, Australia, Canada, United Kingdom, Ecuador) to implement restrictions of child-targeted food marketing, while other countries continue to debate such policies.^{9,10}

Food companies engage in child-targeted marketing to develop brand loyalty early on and because children can influence their parents' food purchases.^{11,12} Although companies engage in a range of child-targeted marketing techniques, promotional characters (for example, cartoon character) are those that can

improve brand recognition and lead to the development of strong product emotional attachment.^{8,13} Promotional characters have been found to attract children's attention, improve product recognition and create positive brand attitudes.^{14–16} As a result, food companies either develop their own brand spoke characters (for example, Quicky from Nesquik) or pay for licensed characters from popular children's television shows or movies (for example, Buzz Lightyear from Toy Story).¹⁷ Children are also more likely to prefer foods with familiar characters compared with unknown characters.¹⁸ Licensed characters have also been found to make packages stand out and increase sales.^{18–21} Furthermore, they have been found to influence children's taste and snack preferences (better taste and preference for those snacks with a character on the package compared with their counterparts with no character).²² These characters are frequently used to promote high-energy, low-nutrient foods.^{8,23} For example, in 2013 a Guatemalan company placed Tom and Jerry on the package of 'Tortillitas' (Señorial), a popular high-energy, low-nutrient snack among school-age children.

Guatemala a LMIC (Gross Domestic Product (GDP) per capita of US\$3351 compared to US\$49965 in the United States²⁴) is at the initial stages of the obesity epidemic. As in high-income countries, LMICs (including Guatemala) are being targeted by the food

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industry with the same child-targeted marketing techniques.⁷ As of December 2013, Guatemala lacks regulations on food marketing to children or evidence documenting the influence that licensed characters can have on children's taste and snack preference. Therefore, the overall objective of this study was to collect data to inform policy makers regarding the need to regulate food marketing to children. We specifically sought to examine whether licensed characters displayed on food packaging influence Guatemalan children's taste and snack preferences using a previously developed methodology.²²

MATERIALS AND METHODS

We conducted the study in four public schools (two preschool and two elementary) in the Municipality of Mixco in Guatemala after obtaining permission from the School District Supervisor and school principals. Teachers provided the lists of all students enrolled in preschool (Nursery-Kindergarten, age range 4–6 years old) and elementary school (Grades 1–3, 7–9 years old). The lists were stratified by gender to select children from each grade using a random digit generator. Parents of the selected children were then invited to a school meeting where the study procedures were described. Only children with written parental consent and child assent forms participated in the study. The study protocol was reviewed and approved by the IRB of the Institute of Nutrition of Central America and Panama (INCAP) in Guatemala.

Trained research assistants conducted face-to-face interviews with the child's mother (74%), father (7%), grandparent (14%) or other family member (5%) to gather information about the child's age and television-viewing habits (that is, amount of time spent watching television, number of movies watched per week). Children participated in a food-tasting activity either before or after the morning recess with trained research assistants.

Food-tasting activity

We used a previously developed methodology to assess the influence that licensed characters have on children's food taste and preference.²² The three food types used were honey graham crackers (Fit (Gama); serving size: 26 g, 110 kcal, 8 g of sugar, 3 g of total fat), potato chips (Rufitas, original flavor (Señorial); 20 g, 100 kcal, 0 g of sugar, 5 g of total fat) and baby carrots (Baby Beluga Carrots (Beluga); 85 g, 38 kcal, 6 g of sugar, 0 g of total fat). Foods were presented in two identical clear packages with identical stickers identifying the food type (for example, 'carrots,' 'potato chips') in Spanish. The only difference between each package was that one had a licensed character in the center and the other did not (Figure 1). To identify the three licensed characters used in the study, we asked fourteen children (age range 4–10 years old) from different schools to list their top five favorite television cartoons. SpongeBob SquarePants, the Pink Panther and El Chavo were the most frequently cited and therefore used for the food-tasting activity (Figure 2). To the best of our knowledge, none of these characters were being used during the study period for marketing of snack foods similar to the ones we used in the tasting activity. We used a random digit generator to ensure that children were exposed to all three food types and characters, but not in the same order or combination (foods were randomly paired with different characters for each child).

The food-tasting activity was conducted in each school in an empty classroom to avoid distractions. Each child sat at a table with one research assistant, who said, 'I am going to give you two foods to taste.' The research assistant then placed a tray with two packages of one of the three food types and said 'I would like you to take a bite of this food,' pointing to one side of the tray, opening the package and placing one piece in a disposable plate. Next, they were pointed to the other package, opened the package and placed one piece from that package on another plate and said, 'Now take a bite of this food.' After tasting the two samples, children were asked, 'Tell me if they taste the same or point to the food that tastes best.' Preference for the food in the package with the licensed character was coded as +1, without the character as -1 and no preference as 0. The research assistant then placed a smiley-face Likert scale in front of the child and asked (while pointing to one side of the tray), 'How much do you like the way this tastes? Do you love it, like it, it's OK, you don't like it, or you hate it?' The scale ranged from 5 (love it) to 1 (hate it). The child then rated the food from the other package and then was asked which one they would pick as a snack. Preference for the one in the package with the licensed character was coded as +1 and without the character as -1. The



Figure 1. Photograph of two separate potato chip packages shown to children, one with a licensed character and the other without.



Figure 2. Licensed characters used in the food-tasting activity with children.

same method was repeated for the remaining two foods. We randomly varied the side of the tray the food package with the character was on as well as the food that was pointed to first. Finally, children were asked to name the characters displayed on the packages, using a separate but identical image, and to rate how much they liked them by using the smiley-face Likert scale. At the end each child received a set of school supplies (that is, notebook, pencil, eraser, crayons) in recognition for their time.

Statistical analyses

The total taste preference score was the average of scores across all foods (between -1 and +1). Snack preference for the food in the package with the licensed character was coded as +1 and without the character as -1. Total snack preference score was the average of scores across all participants (between -1 and +1). Likert scale taste ratings were averaged to calculate a continuous measure of taste preference (between 1 and 5).

Descriptive statistics were used to summarize the sample demographics. Mean (s.d.) or median (25th–75th percentiles) were used when appropriate. Nonparametric McNemar tests were conducted to analyze the taste and snack preference for each of the food types. Finally, we explored whether demographic and other variables correlated with children's taste and snack preference scores using the nonparametric Spearman rank correlation for continuous variables, Wilcoxon–Mann–Whitney *U*-test for dichotomous variables and Kruskal–Wallis test for categorical variables.

RESULTS

Of the 246 families who were invited to participate, 144 attended the school meeting and 129 agreed to allow their children to participate (52% response rate). Eight participants had incomplete information and were excluded leaving 121 children in the sample. Excluded participants are likely to have the same

characteristics given that they were all recruited from the same public schools. Age ranged from 4.3 to 11.5 years, and a slight majority were female (Table 1).

Children preferred the taste of foods with characters on the packaging over those presented in plain packaging. The mean ($\pm$ s.d.) total taste preference score was 0.24 ± 0.54 and was significantly greater than zero ($P < 0.001$). Similar results were found using the Likert taste preference score. Mean taste preference score was 4.18 ± 0.67 . Taste preference for the food inside the package with the character ranged from 60.3% for the graham crackers to 49.6% for the potato chips (Table 2). Regarding snack preference, preference ranged from 71.1% for the potato chips to 60.3% for the baby carrots (Table 2).

The influence of characters on taste (but not snack) preference scores was associated with children's age and grade. Younger children ($P < 0.001$) were more likely to prefer the taste of the food inside the package with a licensed character (Figure 3). There were no other significant associations between taste and snack preference and gender, time spent watching television, movies watched per week, character liking or recognition. Almost all children correctly identified SpongeBob SquarePants (98%), El Chavo (98%) and the Pink Panther (92%).

DISCUSSION

To the best of our knowledge, this is the first study assessing the influence that licensed characters have on children's taste and snack preferences in a LMIC. Our results yield that Guatemalan

children significantly prefer the taste and are more likely to choose foods for snack that feature licensed characters on the packaging. These results are consistent with previous research. In the United States, 4- to 6-year-old children who saw a licensed character on their cereal box reported significantly higher taste ratings than those whose box did not feature the character.²⁰ Similarly, children in that same age range significantly preferred the taste of foods contained in a package with a licensed character.²²

Our findings confirm previous research documenting that licensed characters influence children's snack taste and preference and suggest that the effects might be different by age and food type.²² Although older children (7- to 11- years old) were also influenced by these characters, younger children were more likely to be swayed into thinking the foods from the packaging with characters tasted better. This might be because children less than 8 years old are capable of identifying characters and logos, but do not have the cognitive capacity to understand that marketing presents a biased point of view.^{25–27} However, snack preference did not differ by age or grade, suggesting that the influence on snack preference is regardless of child's age. Furthermore, our findings yield a significant difference in the influence that licensed characters have on the taste perception for a healthy snack (for example, baby carrots) as opposed to what was previously documented in the United States.²² This might be due to the larger size of our sample leading to increased power (40 children were included in the US study²²). Another possible explanation for the effect on the healthy snack is that a higher percentage of children identified the characters used in our study (92–98%) compared with the one conducted in the United States (60–90%).²² As a result, children might have a better emotional connection with the products, including the baby carrots.^{28,29} Participants in this study were from public schools in Guatemala and might have lower media literacy education and therefore less likely to critically analyze and evaluate media messages.⁵

Our findings have strengths and limitations. This is the first study published from a LMIC documenting the influence that licensed characters have on children's snack food taste and preference. The randomized design allowed us to manipulate the presence of a character on the package, enhancing the ability to draw causal inferences. To prevent bias, children did not receive feedback of their selections and food samples were presented in random order and position. Furthermore, children were also given the option of saying that the samples tasted the same. Regarding limitations, we only included public schools as opposed to other research that included school type (public or private) as a marker

Table 1. Children's demographics ($n = 121$)

Age, mean (s.d.), years	7.4 (1.9)
Female, n (%)	67 (55.4)
Grade category, n (%)	
Preschool (Nursery-Kindergarten)	60 (49.6)
Elementary (Grade 1–3)	61 (50.4)
Households with TV, %	96.7
Days per week watching TV, mean $\pm$ s.d.	6.2 ± 1.8
Hours per day watching TV, median (25th–75th percentile)	2 (1–3)
Number of movies watched per week, mean $\pm$ s.d.	1.3 ± 1.2
Licensed character recognition, %	
SpongeBob SquarePants	98.4
El Chavo	98.4
Pink Panther	91.5

Abbreviation: TV, television.

Table 2. Children's taste preferences and snack choices

Food type	Without character n (%)	Taste same n (%)	With character n (%)	P -value ^a
Potato chips				
Taste preference	37 (30.6)	24 (19.8)	60 (49.6)	< 0.001
Snack choice	35 (28.9)		86 (71.1)	< 0.001
Graham crackers				
Taste preference	32 (26.5)	16 (13.2)	73 (60.3)	< 0.001
Snack choice	41 (33.9)		80 (66.1)	< 0.001
Baby carrots				
Taste preference	40 (33.1)	19 (15.7)	62 (51.2)	< 0.001
Snack choice	49 (39.7)		73 (60.3)	< 0.001

^aNonparametric McNemar test.

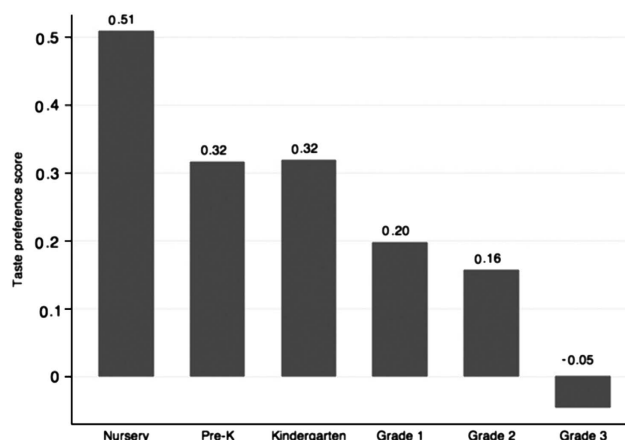


Figure 3. Association between taste preference scores and children's grades. Total preference scores may range from -1 (preferred the snack without licensed character in all comparisons) to $+1$ (preferred the snack with licensed character in all comparisons).

of socioeconomic status (low/middle and high, respectively).^{30,31} Therefore, our results might not be generalizable to children in private schools or those of higher socioeconomic status. In addition, research assistants were not blinded to the study's objective or character presentation. Although they were trained to maintain neutral body and facial expressions, it is possible that they gave unintentional signals possibly influencing children's responses. Finally, although we increased the sample relative to previously published research,^{20,22} the sample size remains small.

In conclusion, our results yield that licensed characters influence Guatemalan children's eating habits by increasing positive taste perceptions and snack preferences. Therefore, policies designed to restrict the use of child-targeted marketing practices, such as licensed characters, might help to reduce preferences for high-energy, low-nutrient products in Guatemala and other LMICs. Furthermore, licensed characters might be useful in promoting healthier foods. However, additional research should examine whether licensed characters on healthier foods can dissuade children from preferring or consuming less healthy foods with or without the characters.³² It is possible that child-targeted marketing efforts for healthy foods will not be influential enough, unless the marketing of unhealthy foods is simultaneously reduced, an important question for future research.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

- de Onis M, Blossner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. *Am J Clin Nutr* 2010; **92**: 1257–1264.
- Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med* 1999; **29**: 563–570.
- Harris JL, Graff SK. Protecting children from harmful food marketing: options for local government to make a difference. *Prev Chronic Dis* 2011; **8**: A92.
- Hastings G, Stead M, McDermott L, Forsyth A, MacKintosh AM, Rayner M et al. *Review of research on the effects of food promotion to children*. Final Report to the UK Food Standards Agency. Strathelyde, UK: University of Strathelyde, Centre for Social Marketing, 2003.
- Hastings G, McDermott L, Angus K, Stead M, Thomson S. *The extent, nature and effects of food promotion to children: a review of the evidence*. Technical Paper Prepared for the World Health Organization: Geneva, 2006.
- Schwartz M, Brownell K. Actions necessary to prevent childhood obesity: Creating the climate for change. *J Law Med Ethics* 2007; **35**: 78–79.
- Cairns G, Angus K, Hastings G. *The extent, nature and effects of food promotion to children: A review of evidence to December 2008*. World Health Organization, 2009.
- Committee on Food Marketing and the Diets of Children and Youth. *Food Marketing to Children and Youth: Threat or Opportunity?*. National Academies Press: Washington, DC, USA, 2006.
- Hawkes C. *Marketing food to children: the global regulatory environment*. World Health Organization: Geneva, Switzerland, 2004.
- Ministerio de Salud Pública. Reglamento de Etiquetado de Alimentos Procesados para Consumo Humano en Ecuador 2013. Available from <http://www.produccion.gob.ec/wp-content/uploads/2013/11/reglamento-de-etiquetado-de-alimentos-procesados-para-el-consumo-humano.pdf>.
- Mindy F. Children's relationships with brands: 'True love' or 'one-night' stand? *Psychology Marketing* 2002; **19**: 369–387.
- Roper S, Shah B. Vulnerable consumers: the social impact of branding on children. *Equal Opportunities Int* 2007; **26**: 712–728.
- Hebden L, King L, Kelly B. Art of persuasion: an analysis of techniques used to market foods to children. *J Paediatr Child Health* 2011; **47**: 776–782.
- Connor SM. Food-related advertising on preschool television: building brand recognition in young viewers. *Pediatrics* 2006; **118**: 1478–1485.
- Neeley S, Schumann D. Using animated spokes-characters in advertising in young children: does increasing attention to advertising necessarily lead to product preference? *J Advert* 2004; **33**: 7–23.
- Mizerski R. The relationship between cartoon trade character recognition and attitude towards product category in young children. *J Marketing* 1995; **59**: 58–71.
- Leibowitz J, Rosch T, Ramirez E, Brill J, Ohlhausen M. A review of food marketing to children and adolescents: follow-up report. *Federal Trade Commission* 2012.
- Kotler JA, Schiffman JM, Hanson KG. The influence of media characters on children's food choices. *J Health Commun* 2012; **17**: 886–898.
- Levin A, Levin I. Packaging of healthy and unhealthy food products for children and parents: the relative influence of licensed characters and brand names. *J Consum Behav* 2010; **9**: 393–402.
- Lapierre MA, Vaala SE, Linebarger DL. Influence of licensed spokescharacters and health cues on children's ratings of cereal taste. *Arch Pediatr Adolesc Med* 2011; **165**: 229–234.
- Dawn J. Licensing: food for thought. *Young Consumers* 2005; **7**: 39–42.
- Roberto CA, Baik J, Harris JL, Brownell KD. Influence of licensed characters on children's taste and snack preferences. *Pediatrics* 2010; **126**: 88–93.
- Chacon V, Letona P, Barnoya J. Child-oriented marketing techniques in snack food packages in Guatemala. *BMC Public Health* 2013; **13**: 967.
- The World Bank. GDP per capita (current US\$) 2013. Available from <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>.
- Ward S, Wackman D, Wartella E. *How children learn to buy*. Sage Publications: Beverly Hills, CA, USA, 1977.
- John D. Consumer socialization of children: a retrospective look at twenty-five years of research. *J Consum Res* 1999; **26**: 183–213.
- Gunter B, Oates C, Blades M. *Advertising to children on TV: Content, impact and regulation*. Lawrence Erlbaum Associates: Mahwah, NJ, USA, 2005.
- Kelly B, Hattersley L, King L, Flood V. Persuasive food marketing to children: use of cartoons and competitions in Australian commercial television advertisements. *Health Promotion Int* 2008; **23**: 337–344.
- Jones SC, Mannino N, Green J. 'Like me, want me, buy me, eat me': relationship-building marketing communications in children's magazines. *Public Health Nutr* 2010; **13**: 2111–2118.
- Montenegro-Bethancourt G, Doak CM, Solomons N. Fruit and vegetable intake of schoolchildren in Quetzaltenango, Guatemala. *Revista panamericana de salud publica* 2009; **25**: 146–156.
- Bermudez OI, Toher C, Montenegro-Bethancourt G, Vossenaar M, Mathias P, Doak C et al. Dietary intakes and food sources of fat and fatty acids in Guatemalan schoolchildren: a cross-sectional study. *Nutr J* 2010; **9**: 20.
- Wansink B, Just DR, Payne CR. Can branding improve school lunches? *Arch Pediatr Adolesc Med* 2012; **166**: 967–968.