Understanding individual and socio-cultural factors associated with hispanic parents' provision of sugar-sweetened beverages to young children

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ABSTRACT

Sugar-sweetened beverages (SSBs) contribute to childhood obesity, long-term risks for diet-related diseases, and health disparities affecting communities of color. Hispanic children are disproportionately affected by obesity, but research is needed to better understand culturally specific reasons for providing SSBs to Hispanic children. This exploratory study utilized the Social Ecological Model framework to evaluate Hispanic parents' perceptions of SSBs and serving them to young children. A cross-sectional survey (in English and Spanish) used a national US online panel to recruit a convenience sample of Hispanic parents (N = 350) with young children (aged 1–5 years). Participants reported types of drinks and SSB brands that they served their child in the past month and rated drink healthfulness. Attitude questions assessed individual, community-level, and socio-cultural factors, including normative beliefs, about serving SSBs to young children. Nearly all parents (98%) reported serving their child SSBs in the past month, averaging 6.7 different SSB types. For all categories of SSBs except fruit-flavored drinks, parents who served that type of SSB rated it as significantly healthier than parents who did not serve them. A linear regression model examined associations between individual and socio-cultural factors and number of SSB types served to their child. In the model, higher average rating of SSB healthfulness, child's age, normative beliefs that others serve SSBs to children, being born in the US/Puerto Rico, and parent and child enjoyment of SSBs were positively associated with serving more SSB types, while concerns about SSBs for their own health was negatively related. Language-related acculturation and community-level factors assessed were not significant. Public health initiatives should focus on healthfulness misperceptions of some SSB categories and address normative beliefs to help reduce serving SSBs to Hispanic children.

1. Introduction

1.1. Childhood obesity

Childhood obesity is an epidemic in the United States, with rates more than tripling since the 1970s (CDC, 2016). Furthermore, there are significant ethnic disparities in childhood obesity rates, with Hispanic children being at a disproportionate risk. Hispanic children (2–19 years) have the highest rates of obesity (26%) compared to other racial/ethnic groups, including non-Hispanic white and black children (14% and 22%, respectively) (Ogden, Carroll, Fryar, & Flegal, 2015). A major contributor to childhood obesity is consumption of sugar-sweetened beverage (SSBs) (Kral et al., 2008; Lott, Callahan, Duffy Welker, Story, & Daniels, 2019) defined as "any beverage with added sugar or other caloric sweeteners" (Friedman & Brownell, 2012). SSB consumption begins at an early age: 25% of toddlers (12–24 months) and 45% of preschoolers (24–48 months) consume SSBs on a given day (Roess et al., 2018; Rosinger, Herrick, Gahche, & Park, 2017; Welker, Jacquier, Catellier, Anater, & Story, 2018). Fruit drinks are the most common type of SSB consumed by young children (Bleich, Vercammen, Koma, & Li, 2018; Welker et al., 2018). However, children as young as 2 years old also consume other types of SSBs, including soda, iced teas, and sports drinks (Welker et al., 2018).

As a result, the American Academy of Pediatrics (AAP) and other leading health organizations recommend that children under age 6 should never consume SSBs (Lott et al., 2019). Health experts also

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recommend public health initiatives to promote healthy beverage intake during early childhood and highlight the need for research to better understand SSB consumption among racial/ethnic minority children to better inform these initiatives (Lott et al., 2019).

1.2. Hispanic children's SSB consumption

As found with children overall, young Hispanic children regularly consume SSBs. Among children 0–24 months old, Mexican-American children were more likely to consume sweetened beverages compared to non-Hispanic white children (Grimes, Szymlek-Gay, & Nicklas, 2017). Another study of toddlers (2–4 years) using 24-h dietary recalls found that on a given day 45% of Hispanic children consumed a sweetened beverage, contributing 109 calories to their diet (Welker et al., 2018). Another study found that 54% of young Mexican-American children (2–5 years) and 43% of non-Mexican Hispanic children consumed sweetened beverages on a given day (Bleich et al., 2018). Furthermore, among Mexican-American children, soda consumption was strongly associated with increased risk of obesity (Beck, Tschann, Butte, Penilla, & Greenspan, 2014).

However, research is needed to better understand some inconsistencies in studies that have assessed differences in consumption of SSBs by Hispanic children versus non-Hispanic children. For example, data from the National Health and Nutrition Examination Survey (NHANES) show that young children (2–5 years) in Mexican-American households—but not non-Mexican Hispanic households—were more likely to consume SSBs than non-Hispanic white children (Bleich et al., 2018). In addition, Mexican-American toddlers (1–2 years) consumed SSBs at higher rates than non-Hispanic white and black toddlers (Miles & Siega-Riz, 2017). In other studies, young Hispanic and non-Hispanic white children (2–4 years) were equally likely to consume any SSBs, but Hispanic children were more likely to consume some SSB types (e.g., sports drinks) (Herrick, Terry, & Afful, 2018; Welker et al., 2018). One study found that Hispanic parents were more likely to report serving their children fruit-flavored drinks and sports drinks than non-Hispanic white parents (Munsell, Harris, Sarda, & Schwartz, 2016). However, another study that examined the contribution of different beverage types (including water, milk, soft drinks, and 100% juice) to children's total beverage consumption found no significant differences between Hispanic and non-Hispanic white youth (2–19 years) (Herrick et al., 2018). In addition, studies that assess SSB consumption do not consistently analyze types of SSBs separately, and surveys designed for a general population may not capture culturally specific SSBs served in Hispanic households (e.g., nectar juices, Nido). Therefore, additional research is needed to more closely examine individual and socio-cultural differences within the Hispanic population to understand these seemingly inconsistent findings.

1.3. Understanding why parents serve SSBs to young children

Understanding parents' decisions to serve SSBs to their young children is also essential to developing effective public health initiatives to discourage SSB consumption and encourage healthier drink choices. For example, children with parents who regularly consume soft drinks are more likely to consume these drinks themselves (Grimm, Harnack, & Story, 2004), and Hispanic adults are more likely to consume regular soda than non-Hispanic white and black adults (Kumar et al., 2014). One study showed that Hispanic parents are more likely to perceive fruit-flavored and sports drinks to be healthy choices for their children compared to non-Hispanic white parents, and perceived healthfulness was associated with serving these drinks to their children (Munsell et al., 2016). Moreover, understanding the cultural context of SSB consumption is integral to understanding why parents serve SSBs. For example, in qualitative research Hispanic mothers report giving their children SSBs to avoid tantrums and disagreements with male family members and to accommodate their children's taste preferences (Beck, Takayama,

Halpern-Felsher, Badiner, & Barker, 2014; Mason, Welch, & Morales, 2015). However, these studies did not compare Hispanic and non-Hispanic mothers, so it is not clear whether these findings reflect cultural differences.

Further complicating the development of public health initiatives for Hispanic populations are substantial cultural differences within the US Hispanic population. Health behaviors and outcomes vary substantially depending on factors such as country of origin and language-related acculturation (Hamilton et al., 2009). Studies have found that more acculturated US Hispanic adults have worse health outcomes (Taningco, 2007), including greater risk of cardiovascular disease (Pabon-Nau, Cohen, Meigs, & Grant, 2010) and metabolic syndrome (De Los Monteros, Gallo, Elder, & Talavera, 2008), as well as overall worse diet quality (Yoshida et al., 2017), including consuming more SSBs and fast-food meals (Sharkey, Johnson, & Dean, 2011), compared to more recent or native-born Hispanic immigrants. However, within the Hispanic community, the relationship among acculturation, country of origin, and health is not fully understood (Daviglus, Pirzada, & Talavera, 2014). Illustrating this point, one study found a positive association between acculturation and consumption of sugar and SSBs but no relationship with dietary fat consumption or percent energy from fat (Ayala, Baquero, & Klinger, 2008). Acculturation may also play a role in Hispanic parents' decision to serve SSBs to their young children and the specific products they choose to serve. However, research has not specifically examined this relationship.

1.4. The Social Ecological Model (SEM) framework

The SEM provides one framework to begin to understand the complex factors that may influence Hispanic parents' decisions to serve SSBs and examine socio-cultural differences within the Hispanic community. The SEM proposes that health behaviors are influenced by interactions between individuals, their communities, and the broader environment. Individual factors (including demographics, knowledge, and preferences), community settings (e.g., home, childcare and schools, food retailers), sectors (e.g., healthcare, government, marketing, business sectors), and social and cultural norms and values (e.g., belief systems, traditions, heritage) all interact to affect food activity decisions (USDA, n.d.).

Due to the substantial numbers of factors and interactions between factors proposed by the SEM, no one study can examine all potential influences. However, the SEM has been used to explain other health-related behaviors such as flu vaccine determinants (Kumar et al., 2012), physical activity in African-American women (Fleury & Lee, 2006), improving health literacy (McCormack, Thomas, Lewis, & Rudd, 2017), and melanoma outcome disparities for US Hispanics (Harvey, Oldfield, Chen, & Eschbach, 2016). In addition, the SEM incorporates many factors that have been proposed to explain potential differences in SSB consumption between Hispanic populations, including differing social norms between Hispanics with different cultural backgrounds and greater availability of SSBs in lower-income Hispanic neighborhoods (Adeigbe, Baldwin, Gallion, Grier, & Ramirez, 2015). It also incorporates individual differences that may influence all parents' decisions to serve SSBs to young children, including the age of their child, parents' understanding of the harms of SSB consumption by children, their own SSB consumption, and parents' perceptions of the healthfulness of different types of SSBs (Munsell et al., 2016).

1.5. The present research

The purpose of this research was to explore individual and socio-cultural factors associated with Hispanic parents' decisions to serve SSBs to young children, focusing on normative beliefs, access to SSBs in their communities, and individual factors, including language-related acculturation, child's age, parents' attitudes towards SSBs and knowledge about SSB healthfulness, and other demographic characteristics.

We also examine associations between individual and socio-cultural factors and the number of different SSBs types that Hispanic parents reported serving to their young children in the past month. This exploratory study uses a convenience sample of English- and Spanish-speaking Hispanic parents to begin to understand socio-cultural differences within the Hispanic community and other individual factors that may be associated with Hispanic parents' decisions to serve SSBs. These findings will help inform potential public health initiatives to reduce provision of SSBs to young Hispanic children.

2. Methods

2.1. Survey administration

This cross-sectional study used an online survey with a convenience sample of Hispanic parents, including mothers and fathers, with children aged 1 to 5 who live in their home. Participants were recruited by Offerwise, an online research company that maintains a panel of English- and Spanish-speaking US Hispanics (including Puerto Rican) (Offerwise, n.d.). Offerwise compensates their panelists for participating in its panel but not for completing individual surveys. The survey was administered using Qualtrics online survey software in 2018. The study was determined to be exempt by the University's Institutional Review Board. Participants chose to take the survey in English or Spanish.

Offerwise sent an email invitation to adult panelists who were parents of young child (ren) living in their household to participate in the survey (N = 699), and 98% agreed to participate (N = 683). Those who agreed were screened for self-identifying as Hispanic, having a 1- to 5-year-old child who lives with them at home, and not having another family member who previously took the survey, resulting in 439 qualified participants (63% of those who agreed). Participants who had more than one child in this age group were asked to answer the questions about the child who had the most recent birthday.

2.2. Reported provision of SSBs and other drinks

Participants were first asked to select all categories of drinks they had given their child in the past month. Types of SSBs assessed included fruit-flavored drinks, nectar juices, sports drinks, regular sodas, non-diet sweet teas, sweetened milk drinks, and sweetened flavored waters. For each category, participants selected the specific brands they had provided, presented in random order, with an option to write-in their own answer or select none of the drinks in that category (Supplemental Table 1). These questions were based on previous research conducted with a diverse sample of parents that demonstrated significant differences in perceptions of categories of SSBs versus individual brands (Munsell et al., 2016). In addition, qualitative research with Hispanic parents has demonstrated confusion about the difference between sugar-sweetened fruit drinks and 100% fruit juice (Beck, Takayama, et al., 2014). Categories and brands of drinks were chosen based on previous research detailing popular options for US Hispanics (Mason et al., 2015; Nickelson, Lawrence, Parton, Knowlden, & Mcdermott, 2014). Additional brands and commercial drink categories popular with Hispanic families were also included, such as Inca Kola, Malta soda, and nectar juices. Serving of nectar juices was asked as a "yes" or "no" question, as previous studies have not examined specific brands of nectar juices that are popular with Hispanic families. For comparison purposes, parents also provided prevalence of serving drinks in other categories (i.e., non-SSBs), including 100% fruit juice, diet drinks, plain milks, and plain water. Plain milks were assessed as different types of milk (e.g. white skim, white whole milk) and plain water as three different sources (tap, bottled, and fountain). Serving of diet soda was asked as a "yes" or "no" question. For each drink type that parents indicated serving their child in the past month, they then answered how often they gave their child those types of drinks (including "more than once a day", "once a day", "a few times a week", "a few times in the last

month", and "about once a month").

2.3. Attitudes about SSBs

The next set of questions examined attitudes about providing SSBs adapted from previous public health research that utilized the SEM framework (Kumar et al., 2012). Individual preferences were assessed by asking child and parental preferences for SSBs and parental concerns for their child's and their own sugar intake. Individual knowledge was assessed by evaluating perceptions of SSBs for their health and their child's health, impact on cavities, and awareness of recommendations to limit children's sugar intake. Community setting factors were assessed through perceived ease of access to SSBs for both the parent and child outside of the home and cost of SSBs. Socio-cultural norms included perceived SSB consumption by friends and family and community, familial and community concern about serving SSBs, whether SSBs are a normal part of a child's diet, and if they had been served SSBs by their parents growing up. Normative beliefs questions were based on previous research examining parents' beliefs about children's fast-food consumption in an ethnically diverse sample (Grier, Mensinger, Huang, Kumanyika, & Stettler, 2007). Based on the methods used in that paper, we combined these variables into one scale for normative influence (Cronbach's alpha = 0.69) (Supplemental Table 2). All attitude questions used a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). At the end of this section, participants rated the healthfulness of all categories of drinks assessed on a scale from 0 (not healthy) to 10 (very healthy).

2.4. Participant characteristics

Finally, participants answered demographic questions, including their gender, marital status, education level, country of origin, annual household income, and employment status. Language-related acculturation was assessed using the Brief Acculturation Scale for Hispanics, a validated measure of acculturation that asks about language usage (English or Spanish) to speak and read, speak at home, think, and speak with friends, assessed on a 5-point Likert scale (1 = only English to 5 = only Spanish) (Norris, Ford, & Bova, 1996). As in previous studies (Hamilton et al., 2009), participants who scored 3.0 or above were classified as lower acculturation.

We pretested the survey using cognitive testing with 10 parents of young children to assess understanding and ease of response to individual survey questions. The survey was translated to Spanish by a native Spanish-speaking registered dietitian and researcher.

2.5. Statistical analysis

We report the proportion of parents who served each drink category to their child in the past month and means and standard deviations for number of brands in each category they reported serving. Total number of SSB types served was calculated by adding the number of different drink brands that parents indicated they had served their child in the past month from all SSB categories, including the total number of brands selected in the fruit-flavored drinks, sports drinks, regular sodas, non-diet sweet teas, sweetened milk drinks, and flavored sweetened waters categories, and nectar juices (counted as 1 brand). We also report means and standard deviations for healthfulness ratings of each drink category. Average healthfulness rating for SSBs was calculated by averaging participants' ratings for all seven SSB categories.

Participants were also categorized by language-related acculturation (higher vs. lower) and according to the age of their child (1–2 vs. 3–5 years old). Previous studies using the same dataset showed much higher levels of SSB consumption by preschoolers (2–4 years) (Welker et al., 2018) than by toddlers (1–2 years) (Demmer, Cifelli, Houchins, & Fulgoni, 2018; Kay, Welker, Jacquier, & Story, 2018; Roess et al., 2018). Differences between participants by acculturation and child's age group

were assessed using independent sample t-tests with Bonferroni corrections to adjust for multiple comparisons for total number of SSBs served and healthfulness rating of each drink category in addition to chi-squared tests for percentage of parents who served each category. Independent sample t-tests with Bonferroni corrections also compared perceived healthfulness of each drink category between parents who served and did not serve the drink to their child in the past month.

A regression model, with number of SSBs served as the dependent variable, was built using a backwards elimination approach. All attitude variables were included in the initial model, as well as average SSB healthfulness rating and demographic variables (child age, parent born in the US or Puerto Rico, parent education, income, acculturation, and gender). In the second step, variables with greater than 0.10 significance were removed, and all remaining variables were significant ($p < 0.05$). Supplemental Table 2 presents all attitude questions and significance levels in the initial model. Data were tested for linearity, multivariate normality, no multicollinearity, and homoscedasticity. Only participants who completed the survey (N = 350) were included in the analyses. All statistical analyses were conducted using IBM SPSS Statistics 25.

3. Results

3.1. Participant demographics

A total of 350 participants with children between 1 and 5 years old completed the survey for an 80% completion rate. Females represented slightly more than one-half of respondents (Table 1). Approximately one-half had a high school degree or less, and 28% had a 4-year college degree or higher. The children described in the survey were one-half female; and one-third were 1–2 years old. Approximately one-half of participants were born in the US or Puerto Rico, and another 23% in Mexico. Similarly, 51% answered the survey in English, and 52% of the respondents had a higher language-related acculturation. These three variables (country of origin, language of survey, and language-related

acculturation) were highly related (all $X^2 > 136.0$, $p < .001$).

3.2. Types of drinks served

Nearly all parents (98%) reported serving their child at least one type of SSB within the past month (Table 2). The categories of SSBs most commonly served were fruit-flavored drinks and sweetened milk drinks (90% and 71%, respectively) followed by regular soda, sports drinks, and nectar juices (served by approximately one-half or more). Approximately one-third reported serving sweetened flavored water and/or sweet tea. On average, parents reported serving their child 6.7 different types of SSBs in the past month. Among other drinks (non-SSBs), 88% of participants served 100% fruit juice, while more parents reported serving plain water (97%) and plain milk (96%) than any category of SSB.

The majority (50% or more) of parents who served their child healthier non-SSBs (plain water, plain milk, and 100% fruit juice) reported serving them at least once per day (Supplemental Table 3). Similarly, 61% of parents who served sweetened milk drinks served them once a day or more. For the other SSB categories, the majority of parents (50% or more) who served them reported serving them a few times a week or more often. However, parents who served regular soda and sports drinks reported serving them less frequently than other SSBs: almost 50% reported serving them a few times per month or less. Thus, parents reported serving milk (both plain and sweetened) and plain water most frequently, while sports drinks and regular soda were served least frequently.

3.3. Differences by acculturation and child's age

There were some differences by acculturation in drink categories

Table 1
Participant characteristics (N = 350).

Socio-demographic characteristics		%	N
Parent age	18–24	13.1	46
	25-45+	86.9	304
Parent gender	Male	43.1	151
	Female	55.1	193
Marital status	No answer	1.7	6
	Single	31.4	110
	Married	63.4	222
	Widowed, divorced, separated	5.1	18
Level of education	High School/GED or less	50.0	175
	Some college + 2-year college	21.7	76
	4-year college and beyond	28.3	99
Country of origin	US + Puerto Rico	52.3	184
	Mexico	23.1	81
	Central America, South America, Other	24.3	85
Income	Under 15k	27.5	92
	15k - 24,999	22.1	74
	25k - 39,999	17.3	58
	40k - 49,999	7.8	26
	50k-74,999	6.3	21
	75k+	19.1	64
Employment status	Full-time	32.6	114
	Part-time	19.7	69
	No	47.7	167
Language of survey	English	48.6	170
	Spanish	51.4	180
Child age	1–2 years old	32.3	112
	3–5 years old	67.6	235
Child gender	Male	50.7	177
	Female	47.6	166
Language-related acculturation	Lower (score ≥3.0)	48.0	168
	Higher (score <3.0)	52.0	182

Table 2
Categories of drinks served to their child in the past month (N = 350).

	% of participants who served	No. of products served per category		Top products served*
		M	(SD)	
SSB categories				
Any SSB	98.0	6.68	(4.49)	
Fruit-flavored drink	89.8	2.36	(1.68)	Capri Sun Original, Lemonade†, Kool Aid, Punch‡, SunnyD
Sweetened milk drink	70.9	1.08	(0.93)	Nesquik
Regular soda	59.3	1.08	(1.19)	Coke, Sprite
Sports drink	55.7	0.75	(0.79)	Gatorade
Nectar juice§	48.6			
Sweetened flavored water	35.4	0.44	(0.66)	Capri Sun Roarin' Waters
Sweet tea	31.1	0.52	(0.80)	
Other drink categories				
Plain water (all sources)	97.4			
Plain milk	96.3			
100% fruit juice	88.0	1.54	(1.02)	Apple and Eve, Capri Sun, Minute Maid, Welch's
Diet drink§	11.4			

* Top products include any brand that was selected by 25% or more of parents Plain water (all sources) includes bottle, tap, and fountain combined.
† Lemonade was listed with two brand options: Minute Maid and Lipton Brisk.
‡ Punch was listed with two brand options: Hawaiian, Tampico.
§ Nectar juices and diet drinks were assessed as yes/no questions without product options.

Table 3
Proportion of parents who reported serving categories of drinks to their child in the past month.

Differences by acculturation	Higher acculturation (N = 182)	Lower acculturation (N = 168)	p-value
	% serving (95% CI)	% serving (95% CI)	
SSB categories			
Any SSB	97.2 (95.1–99.3)	98.8 (96.6–100.0)	0.300
Fruit-flavored drink	91.6 (87.1–91.6)	88.0 (83.3–92.6)	0.268
Milk drink	70.2 (63.5–77.0)	71.1 (64.1–78.1)	0.822
Sports drink	**62.9 (55.7–70.2)**	47.0 (39.5–54.5)	0.002
Regular soda	51.7 (44.5–58.9)	**66.3 (58.8–73.7)**	0.007
Nectar juice	41.0 (33.7–48.3)	**56.0 (48.5–63.6)**	0.004
Flavored water	38.8 (31.7–45.8)	32.1 (24.0–38.6)	0.218
Sweet tea	32.0 (25.2–38.9)	30.1 (23.0–37.2)	0.941
Other drink categories			
100% fruit juice	**91.6 (86.8–96.4)**	83.7 (78.8–88.7)	0.024
Plain water (fountain)	**25.8 (19.8–31.9)**	16.9 (10.6–23.1)	0.049
Plain water (all sources)	97.8 (95.4–100.0)	97.0 (94.5–99.4)	0.647
Plain milk	97.2 (94.4–100.0)	95.2 (92.3–98.1)	0.321
Plain water (bottled)	92.1 (87.9–96.4)	89.8 (85.4–94.1)	0.544
Plain water (tap)	28.1 (21.7–34.5)	21.7 (15.1–28.3)	0.155
Diet drink	10.1 (5.4–14.8)	12.7 (7.8–17.5)	0.348

Differences by child age group	1-2 year olds (N = 112)	3-5 year olds (N = 235)	p-value
	% serving (95% CI)	% serving (95% CI)	
SSB categories			
Any SSB	95.5 (92.9–98.2)	**99.1 (93.3–100)**	0.025
Fruit-flavored drink	83.9 (78.3–89.5)	**92.6 (88.7–96.5)**	0.013
Milk drink	61.6 (53.2–70.0)	**74.8 (68.9–80.7)**	0.011
Nectar juice	47.3 (38.0–56.6)	48.7 (42.2–55.2)	0.723
Sports drink	43.8 (34.6–52.9)	**60.4 (54.0–66.8)**	0.003
Regular soda	43.8 (34.8–52.7)	**66.1 (59.8–72.3)**	<0.001
Sweet tea	27.7 (19.1–36.3)	32.2 (26.2–38.2)	0.381
Flavored water	26.8 (18.0–35.6)	**38.7 (32.5–44.8)**	0.024
Other drink categories			
Plain water (all sources)	98.2 (95.2–100.0)	97.0 (94.9–100.0)	0.515
Plain milk	97.3 (93.8–100.0)	95.7 (93.2–100.0)	0.471
Plain water (bottled)	94.6 (89.4–99.9)	89.6 (85.9–93.2)	0.107
100% fruit juice	83.9 (77.8–90.0)	89.6 (85.3–93.8)	0.118
Plain water (tap)	18.7 (10.7–26.8)	27.0 (21.8–32.1)	0.073
Plain water (fountain)	8.9 (1.5–16.4)	**27.0 (21.8–31.2)**	<0.001
Diet drink	6.3 (4.0–12.1)	**13.5 (9.4–17.5)**	0.042

Bold indicates significantly higher response.
Plain water (all sources) includes bottle, tap, and fountain combined.

served (Table 3). Parents with higher acculturation were more likely to report serving sports drinks, whereas parents with lower acculturation were more likely to serve regular soda and nectar juices. For non-SSBs, parents with a higher acculturation were more likely to serve 100% fruit juice and plain water from a fountain. Overall, parents with higher acculturation served significantly more total SSB types (M = 7.2, SD = 4.9) compared to parents with lower acculturation (M = 6.1, SD = 3.9), t (339) = 2.34, $p < 0.05$.

There were more differences in the categories of drinks that parents served their children by age group. Parents were more likely to serve 3- to 5-year-olds more categories of SSBs than 1- to 2-year-olds, including fruit-flavored drinks, sweetened milk drinks, sports drinks, regular soda, and sweetened flavored waters. Overall, parents reported serving significantly more total SSB types (M = 7.2, SD = 4.7) to 3- to 5-year-olds compared to 1- to 2-year-olds (M = 5.1, SD = 3.8), t(337) = 3.37, $p < 0.05$. For non-SSBs, the only significant differences by child age were that participants were more likely to serve plain water (fountain) and diet drinks to 3- to 5-year-olds.

3.4. Healthfulness ratings of drinks by category

Healthfulness ratings (on a 10-point scale) for SSBs ranged from 5.9 for sweetened milk drinks to 2.5 for regular soda (Table 4). With the exception of diet drinks, healthfulness ratings for non-SSBs were higher, ranging from 8.5 for plain water to 7.1 for 100% fruit juice. Parents who served most types of drinks to their child rated the drink as significantly healthier than parents who did not serve the drink, except for fruit-flavored drinks, 100% fruit juice, and plain water. Parents with higher acculturation were more likely to rate sports drinks, milk drinks, and plain milk as healthier. However, there were no differences in healthfulness ratings by acculturation for other drink categories. The only significant difference in perceived healthfulness by age of child was that parents of 3- to 5-year-olds rated diet drinks as significantly healthier than parents of 1- to 2-year-olds (data not reported).

3.5. Parent attitudes about SSBs and regression model

Supplemental Table 2 presents average parent ratings for all SSB attitude questions. In the final regression model, only four out of fifteen attitude measures were associated with number of SSB types served, after controlling for demographic factors. One individual knowledge question ("Sweet drinks are bad for my health") was negatively related to number of SSB types served, while two individual preference questions ("I (i.e., parent) enjoy drinking sweet drinks" and "my child enjoys drinking sweet drinks") and the normative beliefs scale were positively associated with number of SSB types served (Table 5). Average healthfulness ratings for SSBs was significant and showed the strongest association with number of SSB types served.

Among demographic variables entered into the model, child's age had the highest association with number of SSB types served. Parents who were born in the US (including Puerto Rico) was also associated with serving more types of SSBs to their child. However, language-related acculturation, parent gender, and income were not significant after controlling for other variables in the model. The final model accounted for approximately 30% of the variability in the number of SSB types that parents reported serving their child.

4. Discussion

This study documents widespread provision of many different types of SSBs to young children in a convenience sample of Hispanic parents. Despite expert recommendations that children under age 6 should never consume SSBs (Lott et al., 2019), nearly every parent in the survey reported giving their child at least one SSB in the past month, and most provided them weekly or more often. Approximately 90% of parents also reported serving healthier drinks (i.e., plain water, milk, and 100% juice).

This study identified individual and socio-cultural factors that were associated with the number of SSB types that Hispanic parents served to their young children. As expected, parents were significantly more likely to serve most categories of SSBs and a greater number of SSB types to a preschooler (3–5 years) than a toddler (1–2 years), although prevalence of serving SSBs and numbers of SSB types served to 1- and 2-year-olds were still high. In addition, there were some differences by language-related acculturation in the categories of SSBs served to young children. However, acculturation was not independently related to the number of SSB types that Hispanic parents served their young children after controlling for other individual and socio-cultural variables. Acculturation primarily measures language preference, and it appears that other factors may better explain differences between Hispanic populations. In our exploratory model, being born in the US (including Puerto Rico) was significantly associated with number of SSB types served. Therefore, being born in the US and perhaps country of origin may be a more important differentiator than acculturation or language preference in public health initiatives aimed at a Hispanic population.

Table 4
Parents' healthfulness ratings of all drink categories (N = 350).

	Average healthfulness rating (all participants)		Comparison between participants who did vs. did not serve the drink category		
			Served drink	Did not serve drink	
	M	(SD)	M (95% CI)	M (95% CI)	*p*-value*
SSB categories					
Sweetened milk drink	5.91	3.04	**6.4 (6.0–6.7)**	4.8 (4.2–5.4)	<0.001
Nectar juice	5.36	2.98	**6.0 (5.5–6.4)**	4.8 (4.4–5.2)	<0.001
Sweetened flavored water	4.85	3.01	**6.0 (5.5–6.5)**	4.2 (3.8–4.6)	<0.001
Fruit-flavored drink	4.33	3.03	4.4 (4.0–4.7)	3.9 (2.9–4.9)	0.443
Sports drink	4.16	2.89	**4.9 (4.5–5.3)**	3.2 (2.8–3.7)	<0.001
Sweet tea	3.73	2.89	**4.6 (4.1–5.1)**	3.3 (3.0–3.7)	<0.001
Regular soda	2.46	2.97	**2.8 (2.4–3.2)**	1.9 (1.4–2.4)	0.004
Other drink categories					
Plain water	8.54	2.67	8.5 (8.2–8.8)	8.9 (7.1–10.0)	0.689
Plain milk	7.71	2.62	**7.8 (7.5–8.1)**	5.3 (3.9–6.7)	0.001
100% fruit juice	7.14	2.81	7.1 (6.8–7.5)	6.9 (5.9–7.8)	0.242
Diet drink	3.03	2.99	**4.9 (4.0–5.8)**	2.8 (2.5–3.1)	<0.001

*Differences between participants who served vs. didn't serve the drink.
Bold indicates significantly higher response.

As found in previous research with a diverse sample of parents (Munsell et al., 2016), this research also demonstrates the importance of parents' perceptions of SSB healthfulness in their decisions to serve individual categories of SSBs to their young children and the total number of SSB types served. Agreement with the statement, "Sweet drinks are bad for my health," was also negatively related to number of SSBs served. This study also identified misperceptions about the healthfulness of some categories of SSBs. For example, on average parents rated the healthfulness of sugar-sweetened milk drinks (e.g., Nesquik, Nido) as 5.9 out of 10 and nectar juices as 5.4. In addition, parents rated sweetened flavored waters, sports drinks, and fruit-flavored drinks as almost twice as healthy as regular soda, although these drinks contain comparable amounts of added sugar and little or no juice (Harris, Fleming-Milici, Kibwana-Jaff, & Phaneuf, 2020).

However, despite high awareness about the harms of serving sugary drinks to children, agreement with these statements was not related to number of SSB types served. In contrast, parents' reported enjoyment of SSBs and their children's enjoyment of SSBs were positively associated with number of SSB types served. As found in previous research that examined various health-related behaviors (Tipton, 2014; Zoellner, Estabrooks, Davy, Chen, & You, 2012), normative beliefs about others serving SSBs to children were also associated with number of SSB types served. These results support previous findings that parental diet and preferences strongly influence their children's diet (Grimm et al., 2004)

Table 5
Regression model with number of SSB types served to children as the dependent variable.

Independent variable	Standardized β	B	SE
Average healthfulness rating for SSBs***	0.24	0.48	0.10
Child age***	0.21	0.68	0.15
I enjoy drinking sweet drinks**	0.14	0.54	0.19
My child enjoys drinking sweet drinks*	0.12	0.45	0.19
Parent born in the US (including Puerto Rico)*	0.11	0.97	0.42
Normative beliefs scale**	0.14	0.78	0.30
Sweet drinks are bad for my health**	−0.13	−0.54	0.20
Constant	1.31	−2.23	
R²	0.30		
F-ratio	20.56		
N	338		

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

and previous research with caregivers of non-Hispanic black children showing that parent and child enjoyment of SSBs, positive attitudes towards SSBs, and subjective normative values were associated with serving SSBs to young children (Tipton, 2014).

To our knowledge, this study is the first to quantitatively evaluate associations between individual and socio-cultural factors and Hispanic parents' serving of SSBs to their young children and to assess differences within the Hispanic population. It also assessed provision of drinks in seven different SSB categories and utilized specific brand names (including culturally specific brands) to provide a comprehensive picture of the wide range of SSBs that Hispanic parents serve. Furthermore, participants included both mothers and fathers, while most previous research on Hispanic childhood nutrition focused only on mothers. The survey questions were also designed utilizing the SEM framework, which has been validated for community health and nutrition-related behaviors, to measure individual, community level, and socio-cultural factors that may be associated with Hispanic parents' decisions to serve SSBs. The large proportion of participants who took the survey in Spanish represents another strength of this study.

4.1. Limitations

However, this study has limitations. The sample did not include non-Hispanic participants, so we cannot make conclusions about differences between Hispanic and non-Hispanic parents. This study examines prevalence of serving brands and categories of SSBs in the past month, but it did not identify amount served or frequency of serving individual brands. Other commonly used measures, such as recalls and food diaries, provide more accurate consumption data. However, questionnaires represent a common, less resource-intensive means to assess beverage intake in children in situations where researchers wish to examine specific products served (Grummon, Sokol, Hecht, & Patel, 2018). Researchers did not assess portion sizes as they also add burden to participation and are prone to significant measurement error (Grummon et al., 2018). In addition, the study only assessed commercially prepared SSBs and not homemade culturally specific drinks, such as horchatas and aguas frescas. Nonetheless, this design provides new information about the broad range of SSB categories and specific brands that Hispanic parents served their young children over a longer time period than would be possible with other types of intake measures. Finally, although the beverage serving and attitude survey questions were based on previously published research, they have not been validated.

The small, convenience sample also limits the external validity of

prevalence estimates. Moreover, the cross-sectional design cannot assess causality, so we cannot conclude that the factors in the model were the underlying reasons that parents served SSBs. Due to the sample size and relatively small number of covariates, we cannot rule out potential residual confounding in our model. Lastly, as in all survey research, there is a risk of social desirability or memory bias. However, the large number of SSB categories and types that parents reported serving to young children appears to minimize this concern.

4.2. Implications and future research

These findings have numerous implications for public health initiatives to specifically address serving SSBs to young children within the Hispanic population. Due to higher prevalence and number of SSB types served to 3-5-year-olds, it appears that ages 2–3 is a critical age for public health interventions to prevent serving sugary drinks. Development of public health campaigns to address serving SSBs to young Hispanic children should also address the influence of normative beliefs and parent and child enjoyment of SSBs to maximize their impact. These findings suggest that campaigns to replace SSBs with healthier alternatives should also address social norms and enjoyment of healthful options. These efforts should focus on changes at the community level, as well as individuals.

It also appears that public health messages recommending against serving SSBs should specify SSB categories and/or brands in place of general sugary drink messaging. Most parents agreed that sugary drinks are harmful for children, but their perceptions of the healthfulness of different categories of SSBs varied widely, and those perceptions were strongly associated with serving them to their child. Education efforts should distinguish fruit-flavored drinks and nectar juices from 100% fruit juice, and sweetened milk drinks from plain milk, to increase parents' understanding of products that are SSBs and not recommended for children. Previous research has demonstrated that marketing messages that imply healthfulness of specific SSB brands, such as through the use of claims (e.g., good source of Vitamin C, all-natural), may mislead parents to believe marketed brands and associated drink categories are healthful choices for their children (Pomeranz & Harris, 2020; Romo-Palafox, Pomeranz & Harris, 2020). Additional research is needed to assess whether these marketing tactics, as well as marketing that directly targets Hispanic consumers, may disproportionately impact Hispanic parents' provision of SSBs to their young children.

In future research, purposive sampling by country of origin would also be useful to identify differences between individuals born in the 50 states, Puerto Rico, Mexico, and other Spanish-speaking countries to assess differences within the US Hispanic population by US region and country of origin. Qualitative research would be helpful to better understand specific normative beliefs about serving SSBs and potential culturally appropriate messaging to better convey the harms of serving SSBs to their children. Furthermore, future research should utilize the SEM framework to

examine other potential factors that may influence Hispanic parents' provision of SSBs to their children, such as the built environment, exposure to marketing, schools and childcare facilities, and public policies.

5. Conclusions

Widespread provision of SSBs to young Hispanic children is an urgent public health concern. This research identified parents' perceptions of SSB healthfulness, normative beliefs about serving SSBs to children, and parent and child enjoyment of SSBs as potential influences on parents' decision to serve SSBs to young children. Language-related acculturation did not explain differences within the Hispanic community; however, being born in the US and Puerto Rico may be a useful differentiator. Public health initiatives should focus on informing Hispanic parents about the healthfulness of brands and categories of SSBs and the harms of all SSB consumption by young children, as well as addressing normative beliefs to more effectively reduce provision of SSBs to Hispanic children.

Appendix A. Supplemental Tables

Supplemental Table 1
Brands and types of beverages surveyed.

SSB categories	
Milk drink	Nido, Nesquik, Pediasure, Flavored milk (chocolate, strawberry, etc.)
Fruit-flavored drink	SunnyD, Hi-C, Punch[‡], Kool-Aid, Capri Sun, Lemonade[†] Hugs
Regular soda	Coca Cola/Pepsi, Sprite/Mountain Dew, Fanta, Jarritos, Malta (Iberia, Goya, India, Pony), Inca Kola
Sports drink	Gatorade, Powerade, Propel
Sweetened flavored water	Vitamin Water, SoBe Lifewater, Capri Sun Roarin' Waters
Sweet tea	Snapple, Lipton Brisk, Gold Peak, Arizona
Nectar juice[§]	
Other drink categories	
Plain water	Tap water, water fountain, bottled water
Plain milk	White skim (1% or 2% milk), White whole milk, Non-dairy milks (almond, soy, etc.)

(continued on next page)

Supplemental Table 1 (*continued*)

SSB categories	
100% fruit juice	Minute Maid 100% juice, Capri Sun 100% juice, Apple & Eve 100% juice, Welch's 100% juice
Diet drink[§]	

†Lemonade was listed with two brand options: Minute Maid and Lipton Brisk.

‡Punch was listed with two brand options: Hawaiian, Tampico.

§Nectar juices and diet drinks were assessed as yes/no questions without brand options.

Supplemental Table 2

Initial linear regression model of parent attitudes with number of types of SSBs served as the dependent variable (N = 338).

Level	Questions	Mean	SD	Standardized β*	*p*-value
Individual preferences	**My child enjoys drinking sweet drinks**	**3.82**	**1.16**	**0.10**	**0.056**
	I am concerned about my child getting too much sugar from sweet drinks	3.90	1.34	0.02	0.781
	I enjoy drinking sweet drinks	**3.66**	**1.19**	**0.14**	**0.009**
	I am concerned about getting too much sugar in sweet drinks	3.99	1.10	0.01	0.868
Individual knowledge	Sweet drinks are bad for my child's health	3.88	1.11	−0.01	0.926
	Sweet drinks cause cavities	4.11	1.11	−0.03	0.669
	Sweet drinks are bad for my health	**3.91**	**1.20**	**−0.14**	**0.047**
	I am aware of the recommendations to limit the amount of sugar children get	4.20	1.00	−0.08	0.144
Perceived access	It is easy for my child to get sweet drinks outside of our home	3.50	1.35	0.09	0.127
	Sweet drinks are easy for me to get	3.99	1.17	−0.06	0.328
	My child gets sweet drinks from other places within our community	3.17	1.35	0.02	0.657
	Sweet drinks are inexpensive	3.38	1.21	0.08	0.126
Social norms	My parents gave me sweet drinks while growing up	3.52	1.29	0.00	0.934
	My friends and family are concerned about getting too much sugar in sweet drinks	3.96	1.06	0.07	0.213
	Normative beliefs scale[†]	**3.40**	**0.80**	**0.12**	**0.040**

Bold indicates attitude variables included in the final model.

*Result from the full model, prior to elimination of non-significant variables.

†Normative beliefs scale includes: My friends and family enjoy drinking sweet drinks; Most of my friends and family give their children sweet drinks; Sweet drinks are a normal part of a child's diet [in my family]; Most parents give their children sweet drinks [in my community]; Sweet drinks are a normal part of a child's diet [in my community].

Supplemental Table 3

Proportion of how often parents reported serving drinks.

	N	Once a day or more	Few times a week	About once to a few times a month
Plain water	338	86.4	8.9	4.8
Plain milk	328	76.2	15.9	8.0
Fruit-flavored drink	318	40.2	31.3	28.0
100% fruit juice	299	50.2	31.1	18.4
Sweetened milk drink	240	60.8	23.3	15.8
Regular soda	212	19.4	33.0	47.7
Sports drink	192	21.3	29.7	48.9
Nectar juice	170	40.0	28.8	31.2
Sweet tea	129	33.4	31.0	35.6
Sweetened flavored water	121	45.4	24.0	30.6
Diet drink	37	37.8	21.6	40.5

References

Adeigbe, R. T., Baldwin, S., Gallion, K., Grier, S., & Ramirez, A. G. (2015). Food and beverage marketing to latinos. *Health Education & Behavior, 42*(5), 569–582. https://doi.org/10.1177/1090198114557122

Ayala, G. X., Baquero, B., & Klinger, S. (2008). A systematic review of the relationship between acculturation and diet among latinos in the United States: Implications for future research. *Journal of the American Dietetic Association, 108*(8), 1330–1344. https://doi.org/10.1016/j.jada.2008.05.009

Beck, A. L., Takayama, J. I., Halpern-Felsher, B., Badiner, N., & Barker, J. C. (2014a). Understanding how latino parents choose beverages to serve to infants and toddlers. *Maternal and child health, 18*, 1308–1315. https://doi.org/10.1007/s10995-013-1364-0

Beck, A. L., Tschann, J., Butte, N. F., Penilla, C., & Greenspan, L. C. (2014b). Association of beverage consumption with obesity in Mexican American children. *Public Health Nutrition, 17*(2), 338–344. https://doi.org/10.1017/S1368980012005514

Bleich, S. N., Vercammen, K. A., Koma, J. W., & Li, Z. (2018). Trends in beverage consumption among children and adults. *Obesity, 26*(2), 432–441. https://doi.org/10.1002/oby.22056, 2003-2014.

(n.d.) CDC, Obesity. (2016). Retrieved january 20, 2020, from CDC healthy schools website: https://www.cdc.gov/healthyschools/obesity/index.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhealthyschools%2Fobesity%2Ffacts.htm.

Daviglus, M. L., Pirzada, A., & Talavera, G. A. (2014). Cardiovascular disease risk factors in the hispanic/latino population: Lessons from the hispanic community health study/study of latinos (HCHS/SOL). *Progress in Cardiovascular Diseases, 57*(3), 230–236. https://doi.org/10.1016/j.pcad.2014.07.006

De Los Monteros, K. E., Gallo, L. C., Elder, J. P., & Talavera, G. A. (2008). Individual and area-based indicators of acculturation and the metabolic syndrome among low-income Mexican American women living in a border region. *American Journal of Public Health, 98*(11), 1979–1986. https://doi.org/10.2105/AJPH.2008.141903

Demmer, E., Cifelli, C. J., Houchins, J. A., & Fulgoni, V. L. (2018). Ethnic disparities of beverage consumption in infants and children 0-5 years of age; National Health and Nutrition Examination Survey 2011 to 2014. *Nutrition Journal, 17*(1), 78. https://doi.org/10.1186/s12937-018-0388-0

Fleury, J., & Lee, S. M. (2006). March). The social ecological model and physical activity in African American women. *American Journal of Community Psychology, 37*, 129–140. https://doi.org/10.1007/s10464-005-9002-7

Friedman, R., & Brownell, K. (2012). *SUGAR-SWEETENED BEVERAGE TAXES an updated policy Brief*.

Grier, S. A., Mensinger, J., Huang, S. H., Kumanyika, S. K., & Stettler, N. (2007). Fast-food marketing and children's fast-food consumption: Exploring parents' influences in an ethnically diverse sample. *Journal of Public Policy and Marketing, 26*(2), 221–235. https://doi.org/10.1509/jppm.26.2.221

Grimes, C. A., Szymlek-Gay, E. A., & Nicklas, T. A. (2017). Beverage consumption among U.S. children aged 0–24 months: National health and nutrition examination survey (NHANES). *Nutrients, 9*(3). https://doi.org/10.3390/nu9030264

Grimm, G. C., Harnack, L., & Story, M. (2004). Factors associated with soft drink consumption in school-aged children. *Journal of the American Dietetic Association, 104*(8), 1244–1249. https://doi.org/10.1016/j.jada.2004.05.206

Grummon, A., Sokol, R., Hecht, C., & Patel, A. (2018). *Assessing beverage intake in children and adolescents: State of the science, recommendations, and resources for evaluation*.

Hamilton, A. S., Hofer, T. P., Hawley, S. T., Morrell, D., Leventhal, M., Deapen, D., et al. (2009). Latinas and breast cancer outcomes: Population-based sampling, ethnic identity, and acculturation assessment. *Cancer Epidemiology Biomarkers and Prevention, 18*(7), 2022–2029. https://doi.org/10.1158/1055-9965.EPI-09-0238

Harris, J. L., Fleming-Milici, F., Kibwana-Jaff, A., & Phaneuf, L. (2020). *Sugary drinks FACTS: Food advertising to children and teens score*.

Harvey, V. M., Oldfield, C. W., Chen, J. T., & Eschbach, K. (2016). Melanoma disparities among US Hispanics: Use of the social ecological model to contextualize reasons for inequitable outcomes and frame a research agenda. *Journal of Skin Cancer, 2016*. https://doi.org/10.1155/2016/4635740

Herrick, K. A., Terry, A. L., & Afful, J. (2018). Beverage consumption among youth in the United States, 2013-2016 data Brief No. 320. Retrieved January 20, 2020, from National Center for Health Statistics website: https://www.cdc.gov/nchs/produc ts/databriefs/db320.htm.

Kay, M., Welker, E., Jacquier, E., & Story, M. (2018). Beverage consumption patterns among infants and young children (0–47.9 Months): Data from the feeding infants and toddlers study, 2016. *Nutrients, 10*(7), 825. https://doi.org/10.3390/nu10070825

Kral, T. V. E., Stunkard, A. J., Berkowitz, R. I., Stallings, V. A., Moore, R. H., & Faith, M. S. (2008). Beverage consumption patterns of children born at different risk of obesity. *Obesity, 16*(8), 1802–1808. https://doi.org/10.1038/oby.2008.287

Kumar, G., Pan, L., Park, S., Lee-Kwan, S. H., Onufrak, S., & Blanck, H. (2014). Sugar-sweetened beverage consumption among adults — 18 states, 2012. Retrieved January 20, 2020, from Morbidity and Mortality Weekly Report Centers for Disease Control and Prevention website: https://www.cdc.gov/mmwr/preview/mmwrhtm l/mm6332a2.htm.

Kumar, S., Quinn, S. C., Kim, K. H., Musa, D., Hilyard, K. M., & Freimuth, V. S. (2012). The social ecological model as a framework for determinants of 2009 H1N1 influenza vaccine uptake in the United States. *Health Education & Behavior, 39*(2), 229–243. https://doi.org/10.1177/1090198111415105

Lott, M., Callahan, E., Duffy Welker, E., Story, M., & Daniels, S. (2019). *Healthy beverage consumption in early childhood recommendations from key national health and nutrition organizations*.

Mason, M., Welch, S. B., & Morales, M. (2015). Hispanic caregiver perceptions of water intake recommendations for young children and their current beverage feeding practices. *Journal of Applied Social Science, 9*(1), 35–46. https://doi.org/10.1177/1936724414526718

McCormack, L., Thomas, V., Lewis, M. A., & Rudd, R. (2017). Improving low health literacy and patient engagement: A social ecological approach. *Patient Education and Counseling, 100*(1), 8–13. https://doi.org/10.1016/j.pec.2016.07.007

Miles, G., & Siega-Riz, A. M. (2017, June 1). Trends in food and beverage consumption among infants and toddlers: 2005-2012. *Pediatrics, 139*, Article 20163290. https://doi.org/10.1542/peds.2016-3290

Munsell, C. R., Harris, J. L., Sarda, V., & Schwartz, M. B. (2016). Parents' beliefs about the healthfulness of sugary drink options: Opportunities to address misperceptions. *Public Health Nutrition, 19*(1), 46–54. https://doi.org/10.1017/S1368980015000397

Nickelson, J., Lawrence, J. C., Parton, J. M., Knowlden, A. P., & Mcdermott, R. J. (2014). What proportion of preschool-aged children consume sweetened beverages? *Journal of School Health, 84*(3), 185–194. https://doi.org/10.1111/josh.12136

Norris, A. E., Ford, K., & Bova, C. A. (1996). Psychometrics of a Brief acculturation scale for Hispanics in a probability sample of urban hispanic adolescents and young adults. *Hispanic Journal of Behavioral Sciences, 18*(1), 29–38. https://doi.org/10.1177/07399863960181004

Offerwise, & Offerwise. Latin America market research. Retrieved January 20, 2020, from https://www.offerwise.com/.

Ogden, C. L., Carroll, M. D., Fryar, C. D., & Flegal, K. M. (2015). *Prevalence of obesity among adults and youth: United States, 2011–2014 data Brief No 219*. National Center for Health Statistics.

Pabon-Nau, L. P., Cohen, A., Meigs, J. B., & Grant, R. W. (2010). Hypertension and diabetes prevalence among U.S. Hispanics by country of origin: The national health interview survey 2000-2005. *Journal of General Internal Medicine, 25*(8), 847–852. https://doi.org/10.1007/s11606-010-1335-8

Pomeranz, J. L., & Harris, J. L. (2020). Children's fruit "juice" drinks and FDA regulations: Opportunities to increase transparency and support public health. *American Journal of Public Health, 110*(6), 871–880. https://doi.org/10.2105/AJPH.2020.305621

Roess, A. A., Jacquier, E. F., Catellier, D. J., Carvalho, R., Lutes, A. C., Anater, A. S., et al. (2018). Food consumption patterns of infants and toddlers: Findings from the feeding infants and toddlers study (FITS) 2016. *Journal of Nutrition, 148*(9), 1525S–1535S. https://doi.org/10.1093/jn/nxy171

Romo-Palafox, M. J., Pomeranz, J. L., & Harris, J. L. (2020). Infant formula and toddler milk marketing and caregiver's provision to young children. *Maternal and Child Nutrition, 16*(3). https://doi.org/10.1111/mcn.12962

Rosinger, A., Herrick, K., Gahche, J., & Park, S. (2017). *Sugar-sweetened beverage consumption among U.S. Youth, 2011-2014 data Brief No. 271*.

Sharkey, J. R., Johnson, C. M., & Dean, W. R. (2011). Nativity is associated with sugar-sweetened beverage and fast-food meal consumption among Mexican-origin women in Texas border colonias. *Nutrition Journal, 10*(1). https://doi.org/10.1186/1475-2891-10-101

Taningco, M. T. V. (2007). *Policy Brief revisiting the latino health paradox EXECUTIVE SUMMARY*.

Tipton, J. A. (2014). Using the theory of planned behavior to understand caregivers' intention to serve sugar-sweetened beverages to non-hispanic black preschoolers. *Journal of Pediatric Nursing, 29*(6), 564–575. https://doi.org/10.1016/j.pedn.2014.07.006

USDA. (n.d. The social-ecological model - 2015-2020 dietary guidelines. Retrieved January 20, 2020, from Office of Disease Prevention and Health Promotion website: https://health.gov/dietaryguidelines/2015/guidelines/chapter-3/social-ecological -model/.

Welker, E. B., Jacquier, E. F., Catellier, D. J., Anater, A. S., & Story, M. T. (2018). Room for improvement remains in food consumption patterns of young children Aged 2-4 years. *Journal of Nutrition, 148*(9), 1536S–1546S. https://doi.org/10.1093/jn/nxx053

Yoshida, Y., Scribner, R., Chen, L., Broyles, S., Phillippi, S., & Tseng, T.-S. (2017). Role of age and acculturation in diet quality among Mexican Americans — findings from the national health and nutrition examination survey, 1999–2012. *Preventing Chronic Disease, 14*, 170004. https://doi.org/10.5888/pcd14.170004

Zoellner, J., Estabrooks, P. A., Davy, B. M., Chen, Y. C. Y., & You, W. (2012). Exploring the theory of planned behavior to explain sugar-sweetened beverage consumption. *Journal of Nutrition Education and Behavior, 44*(2), 172–177. https://doi.org/10.1016/j.jneb.2011.06.010