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Perceptions of Arguments in Support of Policies to Reduce Sugary Drink Consumption Among Low-Income White, Black and Latinx Parents of Young Children

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Abstract

Purpose: To test for racial/ethnic differences in perceived argument strength in favor of structural interventions to curb childhood obesity among lower-income parents of young children.

Design: Cross-sectional, self-report.

Setting: Online research panel, national sample of 1485 US adults in Fall 2019.

Participants: Parents of children (age 0-5 years) with an annual income <\$40,000, stratified by White, Black and/or Latinx race/ethnicity.

Measures: SSB consumption, policy support, and strength of arguments in favor of marketing restrictions and a penny-per-ounce tax.

Analysis: Descriptive statistics, multivariable OLS models.

Results: Race/ethnicity was not a significant predictor of the perceived strength of a composite of marketing arguments ($p_{\text{Black}} = 0.07$; $p_{\text{Latinx}} = 0.10$), however it was a significant predictor of the perceived strength of tax arguments ($p_{\text{Black}} = 0.01$; $p_{\text{Latinx}} = 0.01$). Perceptions of strength of 12 of 35 discrete SSB tax arguments differed by race/ethnicity ($p < .05$). Arguments regarding industry targeting of Black children (marketing: $p_{\text{Black}} < .001$; $p_{\text{Latinx}} = .001$; tax: $p_{\text{Black}} < .001$; $p_{\text{Latinx}} = .001$), were particularly demonstrative of this difference. In contrast, arguments that these policies would provide support for parents (marketing: $p_{\text{Black}} = 0.20$; $p_{\text{Latinx}} = 0.84$) and communities (tax: $p_{\text{Black}} = 0.24$; $p_{\text{Latinx}} = 0.58$) were seen as strong arguments across groups.

Conclusions: Black and Hispanic/Latinx parents may be more prepared to move toward SSB policy support than white parents. Emphasizing community benefits of policy may be effective in moving constituents toward policy support across groups.

Keywords

health policy, young children, underserved populations, low income, racial minority groups, sugar-sweetened beverages, argument strength, health disparities, youth, nutrition

Sugar-sweetened beverage (SSB) consumption and obesity among young children are widely accepted as major public health concerns in the United States.^{1,2} Environmental and structural solutions to address obesity will be needed to reduce rates of obesity and obesity-related disparities experienced by communities of color and low-income communities.^{3,4}

One proposed approach to addressing childhood obesity is to restrict SSB marketing to children, a major factor driving consumption among children and adolescents.⁵ Junk food and sugary beverage companies disproportionately target Black and Latinx youth,^{6,7} as well as low-income communities.⁸ Furthermore, evidence suggests that non-Hispanic Black children are more strongly affected by such targeted advertisements.⁹ Since individuals have limited control over their marketing

environment, policies restricting SSB marketing are critical to reverse the impact of disproportionate targeting and to support parental and community efforts to reduce SSB consumption.

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Another promising socio-environmental approach is to apply excise taxes to SSBs at a minimum of one penny-per-ounce. Although this policy has demonstrated effectiveness at reducing SSB consumption,^{10,11} the SSB industry has led the opposition with claims that such policies are regressive. These arguments have carried over into public debates in some communities which have linked SSB taxes to racism, suggesting that an SSB tax would “marginalize people of color” in light of its potential disproportionate economic impact on Black and Latinx SSB consumers.¹² Nonetheless, the public health benefits of an SSB tax have the potential to be particularly strong among socioeconomically disadvantaged groups because low-income children and adults suffer greater disease from SSB consumption.^{1,13-16} While the debate about SSB taxes pits public health advocates against industry, voices from the communities targeted by SSB industry marketing are not frequently represented. Given the competing perspectives on the impact of SSB-related policies, complicated relationships between racial equity groups and the SSB industry,¹⁷ and differential SSB consumption rates among groups,¹⁸ racial/ethnic groups may differ in their perceptions of various arguments in favor of SSB policies.

The current study examined how low-income white, Black, and Hispanic/Latinx parents of young children think about these 2 policy strategies to reduce SSB consumption. We gauged levels of support for SSB marketing restrictions and penny-per-ounce SSB taxes and explored perceptions of a range of arguments in favor of these evidence-based policies. We used a web-based panel to recruit low-income parents of young children (0-5 years), stratified by race and ethnicity such that white, Black, and Latinx parents each comprised roughly one-third of the sample. These findings can inform the design of strategic messages to promote parental action to reduce SSB consumption among their children and in their communities.

This analysis is part of a larger, pre-registered project exploring promising strategic arguments to reduce SSB consumption and testing a novel strategy for identifying such arguments. One pre-registered hypothesis relates to a new tool (called a “wikisurvey”) to identify candidate arguments; those analyses will be summarized elsewhere. The current paper focuses on the second pre-registered hypothesis (Pre-registered Hypothesis 2, PH2, OSF Pre-Registration): “The top-ranked arguments, those perceived to be the strongest reasons to take action to reduce SSB consumption in early childhood, will differ by parents’ race/ethnicity.”

Methods

Sampling Strategy and Composition

We contracted with the Survey Research Institute at Cornell University to recruit a national sample of U.S. adults aged 18 and older who are parent to at least 1 child aged 0-5 years. The Survey Research Institute partnered with the online survey research panel Marketing Systems Group (M.S.G) to identify

panel members likely to have an annual household income below \$40,000 and identifying as white, Black, and/or Latinx, based on information collected when panelists registered to participate in M.S.G.’s survey panel. Potentially eligible panelists received an e-mail invitation directly from the vendor to participate in a study “about understanding how parents of young children think about sugary drinks.” Participants provided consent by clicking “I have read the above information and I consent to take part in the study,” after reading the informed consent page online. This study was approved as exempt by the institutional review boards of Cornell University (protocol 1907008949) and Oregon Health & Science University-Portland State University School of Public Health (protocol 196569-18).

We randomly assigned respondents to either a standard closed-ended survey version of the study ($n = 1702$; results reported here) or a wiki survey version ($n = 1601$; results summarized elsewhere). The closed-ended survey version collected a stratified sample in which roughly one-third of respondents each identified as white, non-Hispanic ($n = 562$), African American/Black, non-Hispanic ($n = 437$), and Hispanic/Latinx (any race) ($n = 486$). Well-established patterns of SSB-related health disparities among these groups^{1,14,15} and underrepresentation of both Black and Latinx populations in scholarly research^{19,20} drove this sampling decision. Respondents who selected only white as their racial identity were designated as white. Respondents who selected only African American or Black were designated as Black, and respondents who identified as Hispanic/Latinx were included in that category regardless of which race category they selected. Thirty percent of Hispanic/Latinx respondents identified as non-white and non-Black, nearly half (48%) identified as white, 10% identified as Black, and the remainder identified as multi-racial (choosing 2 or more racial categories). We excluded respondents ($n = 203$) who did not identify as white only, Black only, or Hispanic/Latinx and those ($n = 14$) who did not select any race or ethnicity. This process produced a final analytic sample of $n = 1485$. Supplemental Appendix Tables A and B present the demographic breakdown of respondents. Our sample predominately identified as female (86%), which we attribute to the survey requirement to be a parent of a child aged 0-5 years; overrepresentation of mothers is a recurring challenge in social/psychological research among parents.²¹ Most of the sample also reported being responsible for food shopping (80%) and preparation (79%), which could include purchasing SSBs for the household, thus making marketing and cost particularly salient to this group.

Measures

The primary outcomes were strength of arguments in favor of 2 distinct policies to reduce SSB consumption. We also examined parental and child SSB consumption behaviors and levels of overall support for SSB-related policies.

Primary outcome measures. We asked respondents to indicate the strength of various arguments in favor of (a) SSB marketing restrictions and (b) the implementation of a penny-per-ounce SSB tax, using a 7-point Likert-type scale (1 = extremely weak reason; 4 = neither strong nor weak reason; 7 = extremely strong reason). We collected and synthesized policy-related arguments that have appeared in public discourse from several sources, including published studies,²²⁻²⁷ campaign materials from ballot initiatives,^{28,29} an internal analysis by Berkeley Media Studies Group of 698 comments posted in response to a New York Times article about banning the use of food stamps for purchasing soda,³⁰ and materials that were in use by public health advocates focused on soda consumption and related policies. The research team reached consensus on the list of arguments for the study and shared the list with an advisory board of advocates and researchers who offered some additional items. There were 26 discrete arguments in favor of marketing restrictions (e.g., “Marketing of sugary drinks through celebrities confuses children by making them think these drinks are part of a hip lifestyle.”) and 35 discrete arguments in favor of an SSB tax (e.g., “Adding a tax to sugary drinks will help support community efforts to improve children’s health.”). The greater number of tax-related arguments perhaps reflects the fact that more jurisdictions have explored SSB tax policies than marketing restrictions. Means and confidence intervals, as well as a key to shorthand names for arguments, are available in Supplemental Appendix Tables C and D.

Given the demographic requirements for inclusion in the study (low-income parents of a child ages 0-5, stratified by race/ethnicity), we thought it particularly important to avoid attrition due to respondent fatigue. Thus, we presented each respondent with half of the possible arguments, selected at random, in favor of each of the 2 policies.³¹ We dealt with the planned missing data using the fully conditional specification multiple imputation function on IBM SPSS 27.³² Little’s test of missing completely at random indicated that the missing data were indeed random, justifying the imputation method for missing values ($\chi^2 = 66625$; $df = 67312$; $p = 0.97$).

Multiple imputation approaches model an imputed value based on observed variables within each case and the way observed variables behave across complete cases.³² The presence of numerous observed values per case make multiple imputation a good fit for this data. Our imputation model included race/ethnicity, gender identity, political party, education, income, SSB policy support, beliefs about the SSB industry, and both parents’ and children’s SSB consumption all of which correlated with argument strength. The percentage of missing data indicates the number of imputations that should be run³³; we ran fifty-five (55) imputations based on published guidance. Then we assessed pooled parameter estimates and robust standard errors provided by SPSS 27 through univariate analyses of multiply-imputed data.

Secondary outcome measures. We also gauged several secondary outcomes in the analysis. We measured overall support for the 2 SSB-related policies by asking, on a 7-point Likert scale,

whether respondents opposed or supported “adding a penny-per-ounce tax on sugary drinks that would add 12 cents to the cost of a 12-ounce can of soda” and an index of 6 items (Cronbach’s alpha = .90) gauging various forms of marketing restrictions and marketing-related policies, including items like “restricting advertising of sugary drinks during TV programs watched mostly by children” and “requiring sugary drink companies to pay \$1 to a healthy drink advertising fund for every \$1 they spend on any kind of advertising for sugary drinks.” We also used a series of items based on standard SSB consumption measures: the Beverage Frequency Questionnaire (BFQ) and the Beverage Questionnaire (BEVQ). The BEVQ³⁴ lists beverage options and asks respondents to report how often they consume that beverage per week. We included a battery of items about the parent’s SSB consumption. We chose midpoint values for each frequency range (e.g., 2-3 times per week was coded as 2.5 times per week). When respondents selected “Never or less than one time per week,” they were not asked to specify volume; frequency was coded as 0 times per week, and volume was also coded as 0 mL. We created an index of SSB consumption using responses on the frequency and estimated volume per drink of SSB consumption (SSBs included regular soda, fruit drinks, sports drinks, flavored waters, energy drinks, sweetened coffees, sweet tea, and tea or coffee with cream or sugar). Per the online BFQ,³⁵ minimum volume values were coded at 50% value (e.g., <250 mL was coded as 125 mL), and maximum volume values were coded at 125% of the scaled value (e.g., >710 mL was coded as 888 mL). We list means and confidence intervals for these items in Supplementary Appendix Table B.

Analytic Approach

We conducted all analyses with IBM SPSS v27. We first examined each argument’s perceived strength by ranking items based on their mean response both overall and among the subset of Black, white and Latinx respondents. To formally test PH2, we conducted multivariable OLS regression models. We predicted the composite index of perceived argument strength for each outcome (SSB marketing restrictions and a penny-per-ounce SSB tax) by race/ethnicity controlling for various behavioral, attitudinal, and demographic variables. These control variables included SSB policy support (to account for the fact that policy support likely shapes general perceptions of argument strength related to those policies), adult and child SSB consumption, an index of beliefs about SSB companies, gender identity, political party, income, education, political ideology, shopping and food preparation responsibility, and whether or not respondents received government nutrition benefits or experienced food insecurity in the past year. We also conducted a series of multivariable OLS regression models to assess relationships between race/ethnicity and each discrete argument’s perceived strength. Last, we conducted multivariable regression to assess SSB consumption among adult parents, support for SSB marketing restrictions, and SSB tax policies,

Table 1. Estimated Marginal Means of Perceived Strength of Arguments in Favor Marketing Restrictions on Sugary Drinks Among Different Race/Ethnic Groups of Lower-Income Parents.

| Argument | Black | | Hispanic/Latinx | | White | |
|---------------------------------------|--------------|-------------|-----------------|-------------|------------|-------------|
| | Mean(SE) | 95% CI | Mean(SE) | 95% CI | Mean(SE) | 95% CI |
| Composite Marketing Argument Strength | 4.64(0.09) | [4.48-4.81] | 4.62(0.08) | [4.46-4.77] | 4.50(0.08) | [4.35-4.66] |
| Support Parents Efforts | 4.93(0.13) | [4.68-5.19] | 4.78(0.12) | [4.55-5.01] | 4.76(0.12) | [4.53-4.99] |
| <i>Reduce Profits Over Health</i> | 4.83(0.12)* | [4.59-5.07] | 4.77(0.12) | [4.53-5.00] | 4.59(0.12) | [4.36-4.82] |
| Reduce Child Obesity | 4.82(0.13) | [4.57-5.07] | 4.85(0.12) | [4.62-5.07] | 4.70(0.12) | [4.47-4.93] |
| Limit Vulnerable Exposure | 4.78(0.13) | [4.51-4.98] | 4.75(0.12) | [4.51-4.98] | 4.68(0.11) | [4.46-4.90] |
| Reduce Advertising Exposure | 4.77(0.13) | [4.51-5.03] | 4.73(0.12) | [4.50-4.95] | 4.66(0.12) | [4.43-4.89] |
| Reduce Children Cavities | 4.75(0.13) | [4.49-5.00] | 4.76(0.12) | [4.49-4.97] | 4.68(0.12) | [4.45-4.91] |
| Stop Drink Ads | 4.74(0.13) | [4.49-4.99] | 4.73(0.13) | [4.48-4.98] | 4.65(0.12) | [4.42-4.89] |
| <i>Sponsors Confuse Children</i> | 4.74(0.13)** | [4.48-4.99] | 4.55(0.12) | [4.32-4.78] | 4.52(0.12) | [4.29-4.76] |
| Reduce Child Weight Gain | 4.73(0.13) | [4.47-4.99] | 4.72(0.12) | [4.49-4.96] | 4.65(0.12) | [4.42-4.89] |
| Celebrities Confuse Children | 4.71(0.14) | [4.45-4.98] | 4.64(0.13) | [4.38-4.89] | 4.52(0.13) | [4.27-4.77] |
| Support Community Efforts | 4.71(0.13) | [4.45-4.97] | 4.80(0.13) | [4.55-5.06] | 4.63(0.12) | [4.39-4.86] |
| <i>Targets Poor Children</i> | 4.70(0.14)** | [4.43-4.98] | 4.64(0.14)* | [4.37-4.91] | 4.36(0.13) | [4.10-4.62] |
| <i>Greater Parental Control</i> | 4.64(0.13) | [4.38-4.90] | 4.74(0.13)* | [4.49-4.99] | 4.51(0.13) | [4.27-4.76] |
| <i>Reduce Cancer Diagnoses</i> | 4.62(0.14)* | [4.35-4.88] | 4.71(0.13)** | [4.46-4.96] | 4.36(0.12) | [4.12-4.60] |
| Reduce Healthcare Costs | 4.60(0.14) | [4.32-4.87] | 4.59(0.12) | [4.34-4.83] | 4.38(0.13) | [4.14-4.63] |
| Reduce Child Pestering | 4.60(0.14) | [4.32-4.88] | 4.55(0.13) | [4.30-4.81] | 4.56(0.13) | [4.31-4.81] |
| Limit Targeted Spending | 4.59(0.14) | [4.32-4.87] | 4.50(0.13) | [4.25-4.75] | 4.53(0.13) | [4.29-4.78] |
| Reduce Sugar Consumption | 4.57(0.14) | [4.30-4.84] | 4.55(0.13) | [4.30-4.81] | 4.47(0.13) | [4.21-4.72] |
| Just Like Tobacco | 4.57(0.14) | [4.29-4.85] | 4.50(0.13) | [4.24-4.76] | 4.56(0.13) | [4.30-4.81] |
| <i>Targets Black Children</i> | 4.56(0.14)** | [4.29-4.83] | 4.31(0.14) | [4.04-4.59] | 4.15(0.13) | [3.88-4.41] |
| Reduce Child CVD | 4.56(0.13) | [4.31-4.81] | 4.64(0.12) | [4.40-4.88] | 4.48(0.12) | [4.25-4.88] |
| Decrease Child Consumption | 4.54(0.13) | [4.28-4.81] | 4.46(0.12) | [4.22-4.70] | 4.46(0.12) | [4.22-4.70] |
| Reduce Diabetes Prevalence | 4.51(0.14) | [4.24-4.78] | 4.56(0.13) | [4.32-4.81] | 4.41(0.12) | [4.17-4.65] |
| Reduce Child Cravings | 4.40(0.14) | [4.13-4.66] | 4.46(0.13) | [4.21-4.71] | 4.38(0.13) | [4.13-4.63] |
| Drink More Water | 4.37(0.14) | [4.09-4.66] | 4.43(0.13) | [4.17-4.69] | 4.34(0.13) | [4.08-4.60] |
| <i>Targets Latinx Children</i> | 4.34(0.15) | [4.06-4.63] | 4.37(0.13)** | [4.11-4.64] | 4.08(0.14) | [3.80-4.35] |

Notes: The table above presents the estimated marginal means and confidence intervals measuring the perceived strength for each of the discrete marketing arguments and the composite marketing variable made up of those arguments.

Covariates appearing in the model evaluated at mean values include: Political Ideology, Marketing Policy Support, Penny-per-Ounce Tax Support, Income, Beliefs about SSB Industry practices, Volume of SSBs Consumed by Adult, Volume of SSBs Consumed by Child. We also include a series of dummy variables for various demographic characteristics noted in the analytic approach section.

Italics indicate race as a significant predictor of argument strength modeled with White parents as the reference group and robust standard errors, significant levels are also indicated *($p < .05$), **($p < .01$), ***($p < .001$). Values presented are the pooled results of analysis following multiple imputation.

controlling for demographic variables in SSB consumption models, and for SSB consumption in SSB policy support models.

Results

Primary Outcome 1: Arguments for Restricting Marketing of Sugary Drinks to Children

Table 1 presents means by race/ethnicity for a composite measure of the average perceived strength of arguments for restricting marketing of SSBs to children, adjusted for the demographic and behavioral variables noted above. The table also contains adjusted means for 26 discrete marketing arguments. Race/ethnicity was not a significant predictor of the composite perceived argument strength variable for restricting the marketing of SSBs to children ($b_{\text{Black}} = 0.14$, $p_{\text{Black}} = 0.07$; $b_{\text{Latinx}} = 0.12$, $p_{\text{Latinx}} = 0.10$; Table 1). Parameter estimates with robust standard errors show 6 of 26 arguments differed

significantly by race when controlling for other variables. (See Supplemental Appendix Table E for univariable and multivariable models predicting composite marketing argument strength).

The strongest arguments in favor of restricting SSB marketing to children across racial/ethnic groups emphasized the need to support parental efforts to improve children's health. Arguments focused on protecting children from advertising were also rated highly across groups. In contrast, industry targeting behavior by race and ethnicity was perceived as a relatively weak reason to restrict marketing across racial and ethnic groups, particularly among white respondents.

Primary Outcome 2: Arguments for Implementing a Penny-Per-Ounce Tax on Sugary Drinks

Table 2 presents means by race/ethnicity for a composite measure of the average perceived strength of arguments for a penny-per-ounce tax on sugary drinks, also adjusted for

Table 2. Estimated Marginal Means of Perceived Strength of Arguments in Favor of a Penny-Per-Ounce Tax on Sugary Drinks Among Different Race/Ethnic Groups of Lower-Income Parents.

| Arguments | Black | | Hispanic/Latinx | | White | |
|-------------------------------------|---------------|-------------|-----------------|-------------|------------|-------------|
| | Mean(SE) | 95% CI | Mean(SE) | 95%CI | Mean(SE) | 95% CI |
| <i>Composite Tax Arguments</i> | 4.33(0.10)* | [4.14-4.53] | 4.31(0.09)* | [4.13-4.49] | 4.11(0.09) | [3.93-4.29] |
| Support Parents Efforts | 4.53(0.14) | [4.26-4.80] | 4.50(0.13) | [4.25-4.76] | 4.33(0.13) | [4.07-4.60] |
| Support Community Efforts | 4.50(0.14) | [4.22-4.78] | 4.41(0.13) | [4.15-4.67] | 4.34(0.13) | [4.09-4.60] |
| <i>Targets Poor Communities</i> | 4.53(0.15)** | [4.23-4.82] | 4.41(0.14)* | [4.14-4.69] | 4.12(0.13) | [3.86-4.38] |
| Adult Water Consumption | 4.44(0.14) | [4.16-4.72] | 4.46(0.14) | [4.18-4.74] | 4.44(0.13) | [4.18-4.69] |
| <i>Lower Adult Diabetes</i> | 4.41(0.15)* | [4.13-4.70] | 4.26(0.14) | [3.99-4.53] | 4.14(0.13) | [3.89-4.39] |
| Prevent Lobbying Efforts | 4.41(0.14) | [4.13-4.68] | 4.39(0.13) | [4.14-4.64] | 4.16(0.12) | [3.91-4.40] |
| Fund Child Education | 4.40(0.14) | [4.13-4.68] | 4.29(0.13) | [4.03-4.55] | 4.18(0.13) | [3.92-4.44] |
| <i>Reduce Cancer Diagnoses</i> | 4.39(0.15)** | [4.11-4.68] | 4.31(0.13)* | [4.04-4.57] | 4.02(0.13) | [3.76-4.28] |
| <i>Reduce Child Obesity</i> | 4.39(0.15) | [4.10-4.68] | 4.50(0.14)* | [4.23-4.76] | 4.19(0.13) | [3.94-4.45] |
| Decrease Adult Consumption | 4.39(0.15) | [4.10-4.67] | 4.38(0.14) | [4.11-4.65] | 4.34(0.14) | [4.07-4.60] |
| <i>Targets Black Communities</i> | 4.39(0.14)*** | [4.11-4.66] | 4.33(0.14)*** | [4.06-4.59] | 3.89(0.13) | [3.63-4.15] |
| Reduce Obesity Rates | 4.39(0.14) | [4.13-4.66] | 4.37(0.13) | [4.12-4.62] | 4.20(0.13) | [3.94-4.45] |
| Fund Obesity Prevention | 4.38(0.14) | [4.10-4.66] | 4.32(0.13) | [4.06-4.58] | 4.18(0.13) | [3.91-4.44] |
| <i>Targets Black Children</i> | 4.37(0.15)*** | [4.09-4.66] | 4.22(0.13)* | [3.96-4.48] | 3.85(0.13) | [3.60-4.10] |
| Limit Children Spending | 4.36(0.14) | [4.09-4.64] | 4.41(0.13) | [4.15-4.67] | 4.24(0.13) | [3.99-4.50] |
| Reduce Adult Weight Gain | 4.35(0.14) | [4.07-4.62] | 4.50(0.13) | [4.25-4.75] | 4.21(0.13) | [3.96-4.47] |
| Reduce Child CVD | 4.35(0.14) | [4.08-4.63] | 4.31(0.13) | [4.04-4.57] | 4.10(0.13) | [3.85-4.36] |
| Targets Poor Children | 4.35(0.14) | [4.07-4.63] | 4.29(0.13) | [4.02-4.55] | 4.17(0.13) | [3.91-4.43] |
| Reduce Adult CVD | 4.33(0.14) | [4.05-4.60] | 4.33(0.13) | [4.07-4.59] | 4.13(0.13) | [3.88-4.38] |
| Reduce Diabetes Prevalence | 4.32(0.15) | [4.03-4.60] | 4.22(0.14) | [3.95-4.50] | 4.15(0.13) | [3.89-4.41] |
| <i>Targets Latinx Children</i> | 4.32(0.14)*** | [4.05-4.59] | 4.30(0.13)*** | [4.04-4.55] | 3.88(0.13) | [3.63-4.14] |
| Has Been Successful | 4.31(0.13) | [4.05-4.57] | 4.23(0.13) | [3.98-4.48] | 4.12(0.13) | [3.88-4.37] |
| Adult Sugar Consumption | 4.30(0.15) | [4.02-4.58] | 4.34(0.14) | [4.07-4.60] | 4.20(0.14) | [3.94-4.47] |
| <i>Fund Local Government</i> | 4.29(0.15)** | [4.00-4.58] | 4.19(0.13)* | [3.93-4.45] | 3.88(0.14) | [3.62-4.15] |
| <i>Targeting Latinx Communities</i> | 4.27(0.14)*** | [3.99-4.54] | 4.05(0.13) | [3.79-4.34] | 3.73(0.13) | [3.48-3.99] |
| Adult Cancer Prevalence | 4.27(0.14) | [4.00-4.55] | 4.17(0.13) | [3.91-4.42] | 4.07(0.13) | [3.81-4.32] |
| Reduce Child Weight Gain | 4.26(0.15) | [3.97-4.55] | 4.36(0.14) | [4.09-4.63] | 4.10(0.14) | [3.83-4.36] |
| Reduce Adult Cavities | 4.24(0.14) | [3.96-4.52] | 4.28(0.13) | [4.02-4.53] | 4.12(0.13) | [3.87-4.38] |
| Drink More Water | 4.23(0.15) | [3.94-4.52] | 4.22(0.14) | [3.95-4.49] | 4.00(0.13) | [3.74-4.27] |
| <i>Decrease Child Consumption</i> | 4.21(0.14) | [3.93-4.49] | 4.31(0.14)** | [4.04-4.57] | 3.97(0.13) | [3.71-4.23] |
| <i>Reduce Taxpayer Burden</i> | 4.21(0.14) | [3.93-4.49] | 4.29(0.13)* | [4.03-4.55] | 4.01(0.13) | [3.75-4.27] |
| Has Funded Health Efforts | 4.20(0.14) | [3.92-4.47] | 4.14(0.13) | [3.88-4.40] | 4.22(0.13) | [3.97-4.46] |
| Reduce Children Cavities | 4.18(0.15) | [3.89-4.48] | 4.31(0.14) | [4.04-4.58] | 4.09(0.14) | [3.82-4.36] |
| Increase Price Similarity | 4.17(0.16) | [3.86-4.47] | 4.22(0.14) | [3.95-4.49] | 4.16(0.14) | [3.88-4.44] |
| <i>Limit Sugar Intake</i> | 4.15(0.14)* | [3.87-4.44] | 4.18(0.13)** | [3.93-4.44] | 3.83(0.13) | [3.57-4.09] |

Notes: The table above presents the estimated marginal means and confidence intervals measuring the perceived strength for each of the discrete tax arguments and the composite tax variable made up of those arguments.

Covariates appearing in the model evaluated at mean values include: Political Ideology, Marketing Policy Support, Penny-per-Ounce Tax Support, Income, Beliefs about SSB Industry practices, Volume of SSBs Consumed by Adult, Volume of SSBs Consumed by Child. We also include a series of dummy variables for various demographic characteristics noted in the analytic approach section.

Italics indicate race as a significant predictor of argument strength modeled with White parents as the reference group and robust standard errors, significant levels are also indicated *(p < .05), ***(p < .01), ****(p < .001). Values presented are the pooled results of analysis following multiple imputation.

demographic and behavioral variables noted above (see Supplemental Table F for univariable and multivariable models predicting composite tax support by race/ethnicity). The table also contains adjusted means for 35 discrete tax arguments. Race/ethnicity was a significant predictor of the perceived strength of arguments for implementing a penny-per-ounce SSB tax ($b_{Black} = 0.22$, $p_{Black} = 0.012$; $b_{Latinx} = 0.20$, $p_{Latinx} = 0.013$; Table 2). Multivariable OLS regression reveals 12 of 35 arguments differed significantly by race when controlling for other variables. White respondents ($M = 4.11$, CI: 3.93-4.29) found arguments generally weaker than did Black

($M = 4.33$, CI: 4.14-4.53) and Latinx ($M = 4.31$, CI: 4.13-4.49) respondents.

Overall, the highest-rated tax arguments emphasized that parents and communities need help to improve children's health and that taxes could fund specific needs, including obesity prevention and early childhood education. Arguments focused on industry targeting of poor communities resonated strongly among Black and Latinx parents but weakly among white parents. Specific health risks (e.g., certain cancers and heart disease) were perceived as relatively weak policy arguments. Some racial/ethnic industry targeting strategies were

Table 3. OLS Regression Model Predicting Support for Implementing Policies to Restrict Marketing of SSBs.

| | Model 1 | | | | Model 2 | | | |
|--|---------|------|-------|--------------|---------|------|-------|--------------|
| | b | SE | p | 95% CI | b | SE | p | 95% CI |
| (Constant) | 4.38 | 0.07 | <.001 | [4.25-4.51] | 3.44 | 0.28 | <.001 | [2.90-3.98] |
| Black (ref = White) | -0.06 | 0.10 | 0.55 | [-0.26-0.14] | 0.06 | 0.11 | 0.59 | [-0.16-0.27] |
| Hispanic/Latinx (ref = White) | 0.21 | 0.10 | 0.04 | [0.02-0.40] | 0.26 | 0.10 | 0.008 | [0.07-0.46] |
| Parent Age 35 and Older (versus under 35) | - | - | - | - | -0.06 | 0.09 | 0.54 | [-0.24-0.13] |
| Female (versus else) | - | - | - | - | 0.27 | 0.12 | 0.03 | [0.02-0.51] |
| Employed = 1 (versus Unemployed = 0) | - | - | - | - | 0.04 | 0.09 | 0.69 | [-0.13-0.20] |
| Does Majority of Household Shopping = 1 (versus Doesn't = 0) | - | - | - | - | 0.08 | 0.12 | 0.50 | [-0.15-0.31] |
| Does Majority of Food Preparation = 1 (versus Doesn't = 0) | - | - | - | - | -0.06 | 0.12 | 0.62 | [-0.29-0.18] |
| Received Food Assistance = 1 (versus Did Not Receive = 0) | - | - | - | - | -0.06 | 0.09 | 0.47 | [-0.24-0.11] |
| Reported Food Insecurity = 1 (versus Did Not Report = 0) | - | - | - | - | -0.04 | 0.08 | 0.62 | [-0.21-0.12] |
| Republican = 1 (versus Not Republican = 0) | - | - | - | - | -0.15 | 0.14 | 0.30 | [-0.41-0.12] |
| Democrat = 1 (versus Not Democrat = 0) | - | - | - | - | -0.01 | 0.11 | 0.93 | [-0.23-0.21] |
| Independent = 1 (versus Not Independent = 0) | - | - | - | - | 0.00 | 0.12 | 0.97 | [-0.24-0.24] |
| Political Ideology (higher more conservative 1-7) | - | - | - | - | 0.01 | 0.03 | 0.84 | [-0.05-0.06] |
| Some College or More = 2 (versus Through High School = 1) | - | - | - | - | 0.39 | 0.09 | <.001 | [0.22-0.56] |
| Income (equal increments up to \$40 k) | - | - | - | - | 0.11 | 0.04 | 0.005 | [0.03-0.19] |
| Adult's Weekly Amount of SSBs in Liters | - | - | - | - | -0.01 | 0.00 | 0.04 | [-0.02-0.00] |
| Child's Weekly Amount of SSBs in Liters | - | - | - | - | -0.01 | 0.01 | 0.02 | [-0.02-0.00] |

Note: This table reports the significance levels of unstandardized beta coefficients of OLS regression predicting support for policies to restrict the marketing of SSBs by race/ethnicity categorical demographics, and continuous/ordinal covariates. This measure is a composite of 6 policy items: Restricting advertising of sugary drinks during TV programs watched mostly by children; restricting marketing of sugary drinks on social media and video streaming services (like Netflix, Amazon Prime, Hulu, and YouTube); requiring TV networks to provide free airtime for public service announcements on healthy eating and exercise equal to the time used advertising sugary drinks; restricting sugary drink companies from collecting information about race or ethnicity to target digital advertisements to kids; requiring sugary drink companies to pay \$1 to a healthy drink advertising fund for every \$1 they spend on any kind of advertising for sugary drinks; requiring large warning labels about the health risks of drinking sugary drinks on all sugary drink advertisements. Model 1 includes a single block containing the predictor race/ethnicity; Model 2 includes a second block of demographic, psychographic, and observed variables. N = 1409 lower-income parents of young children in the United States, stratified by race/ethnicity.

perceived as moderately strong reasons for policy among Black and Latinx parents but perceived as weaker reasons among white parents.

We conclude that these findings offer limited support to our pre-registered hypothesis that the top-ranked arguments would differ by race/ethnicity. The perceived strength of arguments differed substantially by race/ethnicity for SSB tax policy but did not differ substantially for SSB marketing restrictions.

Secondary Outcomes: Sugar-Sweetened-Beverage (SSB) Consumption and Policy Support

We conducted a series of supplemental analyses to better understand the relationships among race/ethnicity, adult SSB consumption, and SSB policy support. We first used OLS regression to assess the relationship between race/ethnicity and SSB consumption, support for SSB marketing restrictions, and support for SSB tax policy, again controlling for certain demographic and behavioral covariates.

In analyses that do not adjust for other demographic or behavioral factors, Black respondents reported higher consumption of SSBs by volume than did other respondents (see Supplemental Appendix Table B for raw means). However, race/ethnicity was not a significant predictor of adult SSB consumption in models adjusted for parent gender identity, income, education, shopping/food preparation responsibility,

and whether or not respondents received government nutrition benefits or experienced food insecurity in the past year. Race/ethnicity was a significant predictor of children's weekly SSB consumption in models adjusted for other demographics and behavioral factors. The adjusted means indicate that children of white respondents drink lower quantities of SSBs (M = 3.18, CI: 2.35-4.01) than Black respondents' children (M = 5.15, CI: 4.19-6.10). The difference in SSB consumption was not significant between Latinx respondents' children (M = 4.35, CI: 3.47-5.23) and the other 2 groups.

In these models, higher education (some college or more), identifying as female, and higher income were related to a lower weekly SSB consumption volume among parents and children. Reporting food insecurity was related to a higher weekly volume of SSB consumption in both parents and children.

Table 3 presents the coefficients from OLS regression predicting support for policies to restrict marketing. The model predicts slightly higher support for SSB marketing restriction policies among Latinx (M = 4.42, CI: 4.19-4.64) respondents than Black (M = 4.21, CI: 3.97-4.46) and white (M = 4.16, CI: 3.94-4.38) respondents, whether or not models control for demographic and behavioral variables including consumption. The model does not predict a difference in marketing policy support between Black and white respondents. Additionally, identifying as female, attending some college or more, and

Table 4. OLS Regression Model Predicting Support for Implementing a Penny-per-Ounce Tax on SSBs.

| | Model 1 | | | | Model 2 | | | |
|--|---------|------|-------|--------------|---------|------|-------|--------------|
| | b | SE | p | 95% CI | b | SE | p | 95% CI |
| (Constant) | 3.14 | 0.08 | <.001 | [2.98-3.29] | 3.71 | 0.34 | <.001 | [3.05-4.38] |
| Black (ref = White) | 0.11 | 0.12 | 0.37 | [-0.13-0.34] | 0.12 | 0.14 | 0.39 | [-0.15-0.38] |
| Hispanic/Latinx (ref = White) | 0.52 | 0.12 | <.001 | [0.29-0.75] | 0.49 | 0.12 | <.001 | [0.26-0.73] |
| Parent Age 35 and Older (versus under 35) | - | - | - | - | -0.10 | 0.12 | 0.38 | [-0.33-0.12] |
| Female (versus else) | - | - | - | - | 0.02 | 0.15 | 0.90 | [-0.28-0.32] |
| Employed = 1 (versus Unemployed = 0) | - | - | - | - | 0.16 | 0.11 | 0.12 | [-0.06-0.36] |
| Does Majority of Household Shopping = 1 (versus Doesn't = 0) | - | - | - | - | -0.26 | 0.15 | 0.07 | [-0.55-0.02] |
| Does Majority of Food Preparation = 1 (versus Doesn't = 0) | - | - | - | - | 0.01 | 0.15 | 0.97 | [-0.27-0.30] |
| Received Food Assistance = 1 (versus Did Not Receive = 0) | - | - | - | - | -0.09 | 0.11 | 0.39 | [-0.31-0.12] |
| Reported Food Insecurity = 1 (versus Did Not Report = 0) | - | - | - | - | -0.06 | 0.10 | 0.58 | [-0.27-0.14] |
| Republican = 1 (versus Not Republican = 0) | - | - | - | - | -0.23 | 0.17 | 0.18 | [-0.54-0.12] |
| Democrat = 1 (versus Not Democrat = 0) | - | - | - | - | -0.21 | 0.14 | 0.14 | [-0.48-0.07] |
| Independent = 1 (versus Not Independent = 0) | - | - | - | - | -0.22 | 0.15 | 0.14 | [-0.50-0.09] |
| Political Ideology (higher more conservative 1-7) | - | - | - | - | -0.05 | 0.03 | 0.18 | [-0.12-0.02] |
| Some College or More = 2 (versus Through High School = 1) | - | - | - | - | 0.14 | 0.10 | 0.18 | [-0.06-0.35] |
| Income (equal increments up to \$40 k) | - | - | - | - | 0.00 | 0.05 | 0.96 | [-0.10-0.09] |
| Adult's Weekly Amount of SSBs in Liters | - | - | - | - | -0.01 | 0.01 | 0.004 | [-0.03-0.01] |
| Child's Weekly Amount of SSBs in Liters | - | - | - | - | 0.01 | 0.01 | 0.30 | [-0.01-0.02] |

Note: This table reports the significance levels of unstandardized beta coefficients of OLS regression predicting support for implementing a penny-per-ounce tax on SSBs by race/ethnicity categorical demographics, and continuous/ordinal covariates. The outcome variable is a single-item: *adding a penny-per-ounce tax*. Model 1 includes a single block containing the predictor race/ethnicity; Model 2 includes a second block of demographic, psychographic, and observed variables. N = 1409 lower-income parents of young children in the United States, stratified by race/ethnicity.

higher income were related to higher marketing policy support. Higher SSB consumption by both children and adults was related to slightly lower marketing policy support.

Race/ethnicity was a significant predictor of support for implementing a penny-per-ounce sugary drink tax, whether or not models controlled for observed differences in adult and child SSB consumption (see Table 4). The model predicts higher support among Latinx respondents (M = 3.54, CI: 3.26-3.81) than Black (M = 3.16, CI: 2.86-3.46) and white (M = 3.04, CI: 2.77-3.32) respondents. In contrast, higher SSB consumption by parents was related to lower support for implementing a penny-per-ounce tax.

Discussion

We evaluated the relationship between race/ethnicity and perceived strength of arguments in favor of restricting SSB marketing to children and implementing a penny-per-ounce tax on sugary drinks among low-income parents of 0-5-year-olds. The purpose of this study was to inform policy-promoting messages among priority populations. We hypothesized that the ranking of arguments in favor of policies would differ by race/ethnicity, and this was generally supported for arguments promoting an SSB tax but generally not supported for SSB marketing restriction arguments. Arguments emphasizing the need for strategies that support parents and communities were highly ranked for both policies and across racial and ethnic groups.

In terms of marketing restriction arguments, race/ethnicity was not a significant predictor of perceived strength, overall. However, some discrete arguments demonstrated differences

by race/ethnicity, particularly those associated with industry racial targeting practices. Despite these differences, respondents rated racial targeting arguments as comparatively weak relative to other types of arguments.

Race/ethnicity was associated with perceived strength of arguments in favor of implementing a penny-per-ounce tax on SSBs. White respondents perceived the arguments as weaker overall than did Black and Latinx respondents. Even the strongest arguments—that parents and communities need help improving children's health—were perceived as weaker by white respondents than Black and Latinx respondents. These findings raise the possibility that low-income white audiences may be more difficult to move toward supporting related policy, despite reporting policy support levels similar to those among Black respondents.

Black and Latinx respondents also tended to perceive arguments about industry racial targeting practices as stronger than did white respondents. For example, "Targeting Black Communities" ranked 11th by mean perceived argument strength among Black respondents, 13th among Latinx respondents, and 30th among white respondents. In contrast, industry targeting lower-income communities was perceived as a relatively stronger argument: it ranked 2nd by mean perceived argument strength among Black respondents, 6th among Latinx respondents, and 19th among white respondents. White respondents ranked increased water consumption and decreased adult SSB consumption as relatively strong reasons for implementing a tax. We interpret these responses as signals that communities of color may be more attuned, perhaps through lived experience with such practices, to the value of policy in shaping

commercial industry behavior. In contrast, arguments that emphasize the value of policy in shaping individual consumer behaviors (like increasing water consumption and decreasing consumption of SSBs) may be more resonant among low-income white parents.

Latinx respondents reported the highest levels of support for both policies, compared to Black and white respondents. In the tax policy model, only race/ethnicity and adult SSB consumption were predictive of support, such that white, non-Hispanic race/ethnicity, and higher adult consumption were related to lower support. The latter findings suggest lower-income populations may be attuned to the fact that the regressivity of SSB tax policy primarily impacts heavy consumers of the product.

Last, our exploratory analyses are consistent with previous work describing the potential impact of SSB-related policies on SSB consumption among low-income populations and those with fewer years of formal education. Consistent with prior studies, lower education levels and low-income were associated with higher parental SSB consumption within our sample. This finding is consistent with an argument that policies that restrict current SSB marketing practices hold potential to reduce consumption, given the industry's track record of targeting lower-income areas with lower graduation rates.^{36,37}

Limitations

Cross-sectional data prevents causal interpretations of the results. While performing multiple imputations can inflate standard errors, our analysis also involved multiple comparisons, which can lead to false inferences. To address this concern, we provide p-values and confidence intervals and describe both statistically significant results and the number of tests performed to help distinguish systematic patterns from chance findings. The gender composition of the sample was largely female, thus our findings may be more representative of women than men or other sex/gender identities.³⁸ The salience of arguments regarding racial targeting and equity may have shifted since data collection in fall 2019, in light of the 2020 movement for racial justice. Additionally, the pandemic of 2020 and beyond may have influenced the overall consideration of SSB taxes to raise revenue to support health initiatives.

Conclusion

Arguments highlighting how parents and communities will benefit from implementing a tax can help public health advocates frame their messages in ways that engage populations that are aggressively targeted by the SSB industry. In both SSB marketing restrictions and SSB tax contexts, there were several arguments that all groups perceived as relatively strong. These arguments emphasize the benefits to parents and communities that a tax or marketing restrictions would provide. This finding suggests that messages emphasizing the intersections among SSB industry behavior, parental decisions, and community efforts may be particularly effective in moving diverse constituents toward policy support. There is also a critical need to

So What?

What is already known on this topic?

Low-income, Black, and Hispanic/Latinx children face greater obesity-related health disparities, partly driven by aggressive target marketing of sugar-sweetened beverages (SSBs).

What does this article add?

This novel paper attempts to understand how communities most impacted by SSB industry marketing practices perceive arguments designed to promote SSB-related policies. The large (n = 1485) national sample of parents which is entirely lower-income (<\$40 k) and two-thirds Black and Latinx/Hispanic advances racial equity through research.

What are the implications for health promotion practice or research?

These results suggest messages emphasizing the intersections among SSB industry behavior, parental decisions, and community efforts may be effective in moving diverse constituents toward policy support. The study also calls for further research to understand how to approach discussions of racial injustice and inequity associated with current SSB industry practices, as low-income white parents found weakness in arguments emphasizing industry racial/ethnic targeting.

consider the potential for expanding support among Black and Latinx parents, and minimizing resistance among white parents, to arguments that emphasize racial/ethnic targeting by the industry.³⁹ These observations prompt a need for a deeper understanding of how to facilitate important discussions of racial inequity and injustice associated with current marketing practices in broader efforts to promote SSB tax and marketing policy across racial and ethnic groups.

Authors' Note

All authors have met the criteria for authorship in accordance with the International Committee of Medical Journal Editors (ICMJE) authorship guidelines. Participants provided consent by clicking "I have read the above information and I consent to take part in the study," after reading the informed consent page online. This study was approved as exempt by the institutional review boards of Cornell University (protocol 1907008949) and OHSU-PSU School of Public Health (protocol 196569-18).

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Supplemental Material

Supplemental material for this article is available online.

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