



*Citation for published version:*

Gillison, F, Grey, E & Griffin, T 2020, 'Parents' Perceptions and Responses to the UK Soft Drinks Industry Levy', *Journal of Nutrition Education and Behavior*, vol. 52, no. 6, pp. 626-631.  
<https://doi.org/10.1016/j.jneb.2019.11.005>

*DOI:*

[10.1016/j.jneb.2019.11.005](https://doi.org/10.1016/j.jneb.2019.11.005)

*Publication date:*

2020

*Document Version*

Peer reviewed version

[Link to publication](#)

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# Parents' Perceptions and Responses to the UK Soft Drinks Industry Levy

Research article

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**Acknowledgements:** Our thanks to Kam Ling Sabrina Tam who carried out the data collection for this work.

**Financial support:** This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

**Conflict of interest:** None.

**Authorship:** FG designed the study, supervised data collection, conducted data analysis and drafted the manuscript. EG and TG contributed to interpretation of data and manuscript revision.

**Ethical standards disclosure:** This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Department of Psychology Ethics Committee at the University of Bath. All participants provided informed consent electronically.

## Abstract

**Objective:** To record parents' awareness of the UK Soft Drinks Industry Levy (SDIL), and explore associations between negative psychological reactance to the levy and motivation and intentions to change consumption and purchasing.

**Methods:** A cross-sectional online survey with UK-based parents of 5-11 year old children (n=237). Regression analyses were used to test associations between psycho-social responses to the levy and behavioural intentions to change family consumption and purchasing.

**Results:** 92% of responding parents were aware of the SDIL. 57% supported its aims, but 29% felt it threatened their freedom of choice. 41% expressed intention to change shopping habits or restrict their child's intake as a result. Reactance and motivation were poorer in low income families, and intentions to change positively predicted by motivation.

**Conclusions and implications:** This snapshot suggests the UK Soft Drinks Industry Levy is largely supported by parents and associated with intentions to change their children's intake.

Key-words: Sugar tax; psychological reactance; motivation; financial policy, parent response

## Introduction

In April 2018 the UK Government enforced a soft drinks industry levy (SDIL) for producers and importers of drinks with added sugar aiming to prompt the reformulation of soft drinks and a reduction in portion sizes<sup>1</sup>. While the SDIL was targeted at changing the behaviour of producers (i.e. to reformulate products)<sup>2</sup>, it was introduced as part of the Childhood Obesity Strategy<sup>3</sup> and explicitly aimed to reduce children's sugar consumption. Taxation policies on suppliers and producers in other domains, such as tobacco and alcohol, have been shown to impact individuals' purchasing and consumption patterns<sup>4,5</sup>, often because producers increase product prices to cover the cost of the tax.

Research exploring the effects of policies on health and behaviours rarely considers the psychological and psychosocial factors that may mediate their outcomes<sup>6,7,8,9</sup>, yet this can be an important determinant of how people respond. For example, policies may be perceived as motivating and helpful in shifting social norms; such outcomes have been reported in response to many tobacco reduction policies by people who are trying to quit smoking<sup>6</sup>. However, policies may also result in psychological reactance, defined as negative emotional reactions to a policy, associated with people entrenching behaviour in the opposite direction from that intended<sup>7</sup>. Reactance is often triggered when policies are perceived to infringe on personal freedom, raise anxiety, or fail to reflect people's values and priorities<sup>8</sup>. In relation to obesity policy, individuals' obesity attributions (i.e. the degree to which people believe obesity is caused by environmental, genetic or individual factors) have also been shown to explain part of public support for policy<sup>9</sup>. Studying psychosocial responses to emerging policies through natural experiments could help to create a better understanding of the psychological mechanisms in play, and inform future policies and how they are framed. Finally, a person's attitude towards a behaviour may influence how they respond to a policy that targets the behaviour<sup>10</sup>.

The aim of this study was to explore parents' reactions to the UK Government's SDIL shortly after its introduction in April 2018. As young children are not usually in direct control of food

and drink purchases, any effects of the SDIL on children's consumption of SSBs are likely to be through changes in their parents' purchasing of SSBs and regulation of their children's consumption.

The focus was to assess support for the SDIL, alongside indicators of policy effects on parents' motivation to reduce family SSB purchasing and intake, and reactance against the levy through testing three hypotheses. The first was that parents' perceptions of threat to their freedom raised by the SDIL, alongside their obesity attributions (i.e. greater individual attribution, and lesser genetic and environmental attribution), would predict psychological reactance. Second, that the degree of psychological reactance experienced would in turn predict autonomous motivation to change purchasing and consumption (higher reactance predicting lower autonomous motivation and behaviour change). Third, that autonomous motivation would predict positive intentions towards purchasing and consumption. This final hypothesis provides the link between initial psychological responses and their likely translation to a behavioural response that can be predicted by intention <sup>11</sup>.

In light of the evidence that fiscal policies have different effects on people according to their socio-economic status (SES)<sup>12, 13</sup>, a secondary aim was to explore differences in responses from parents in households at or below the UK average income with those on higher than average incomes.

## **Methods**

### **Participants**

Parents with at least one primary school aged (5-11 years) child, living in the UK were eligible to take part. Recruitment took place primarily through social media (Facebook and research volunteer websites), and through handing out flyers at community 'fun day' events in South West England run by leisure providers aimed at families. Entry into a prize draw for a £50 (64 USD) shopping voucher was offered as an incentive to complete the study.

## Design

The study was conducted as an online survey using a convenience sample, and was approved by the Institutional Review Board at the University of Bath. The first page of the survey provided information about participating in the study and recorded parent consent. The inclusion criteria required that respondents be parents of one or more 5-11 year old child, to be fluent in English and able to respond through a computerised survey. Parents who had more than one child were asked to answer the questions relating to the food and drink intake of their oldest primary-school aged child. Responses were provided between the 18<sup>th</sup> May and 31<sup>st</sup> July 2018.

## Measures

### Demographics

Respondents reported their age, gender, nationality (free-text response), ethnicity (from 16 options, including 'other'), highest level of education, combined household income (within set ranges), and employment status. The number and ages of their children were also recorded.

### Sugar Sweetened Beverage intake

Intake of SSBs was assessed using the Beverages Intake Questionnaire<sup>14</sup>, which required parents to report their child's daily consumption (frequency and volume) of 9 types of beverage. Intake was calculated by multiplying number of servings per week by estimated serving size. Weekly totals of SSBs and sugar-free beverages were computed. Pure fruit juice was not included in either category.

### Awareness of and attitudes towards the SDIL

Parents were provided with a brief definition of the SDIL adapted from text provided on the gov.uk website<sup>15</sup>: *The 'soft drinks industry levy' introduced in the UK in April 2018 targets the producers and importers of sugary soft drinks to encourage them to remove added sugar and reduce portion sizes for high sugar drinks. It means soft drinks companies will pay a charge for drinks with 5% or more of added sugar, and that cost may be passed on to the people buying the drinks.* Parents' were asked whether or not they were aware of the SDIL

and if they had “noticed any changes to the cost of soft drinks”. Attitudes towards the SDIL were assessed by asking parents to rate on a 7-point Likert scale whether they support what the SDIL is trying to accomplish (labelled from *strongly disagree* to *strongly agree*; scale developed in accordance with guidance on attitude measurement)<sup>16</sup>.

#### Threat to freedom

Perceived threat to freedom was measured using a 4-item questionnaire<sup>17</sup> adapted through altering the stem to refer to the SDIL, e.g. “*The soft drinks levy tries to make a decision for me*”. Responses were recorded on a 5-point Likert scale labelled from *strongly disagree* to *strongly agree*, and combined to provide a mean total score.

#### Psychological Reactance

Reactance to the SDIL was measured by asking participants to rate their emotional response to the SDIL in relation to whether its introduction made them feel: irritated; angry; annoyed; and aggravated<sup>17</sup>. Participants responded on 5-point Likert scales with higher scores indicating greater reactance. A mean of ratings for all 4 items was used as a measure of reactance.

#### Causal attributions

Parents’ causal attributions for obesity were measured using the Attributions for Obesity scale<sup>18</sup>. Two items are included for each of three subscales: i) individual attributions (e.g. *Most people lack the willpower to diet or exercise regularly*); ii) environmental attributions (e.g. *There is too much unhealthy and fatty food in restaurants and supermarkets*); and iii) genetic attributions (e.g. *Being overweight is something you inherit from your parents*). Scores were recorded on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), and averaged to calculate subscale scores. The mean rating across both items was used for each subscale.

#### Intentions

A health behaviour intentions questionnaire was adapted to measure parents’ intentions in relation to 5 key SSB-related behaviours, identified from past research<sup>19</sup>. Parents’ were

asked to report their intentions over the next month, along a 5-point Likert scale (*strongly disagree* to *strongly agree*), for each behaviour: buying fewer sugar-sweetened drinks in my regular shop; buying fewer sugar-sweetened drinks for my children when outside the home; reducing the number of sugar-sweetened drinks my children have; drinking fewer sugar-sweetened drinks myself; and making no conscious changes to how many sugar-sweetened drinks my family buy or drink.

### Motivation

Motivation towards reducing “*the amount of sugary drinks my family drinks*” was measured using an adapted version of the treatment self-regulation questionnaire<sup>20</sup>. The questionnaire incorporates 15 items tapping autonomous (e.g. *because I feel that I want to take responsibility for my own health*) and controlled (e.g. *because I would feel bad about myself if I did not eat a healthy diet*) regulations towards reducing SSB intake. Autonomous motivation (i.e. feeling one is acting in line with one’s values, as a behaviour is personally meaningful) is routinely associated with sustained behaviour change, while controlled motivation (acting to gain rewards, avoid punishments, negative judgements or feeling guilty) can boost initial uptake but rarely results in sustained behaviour<sup>21</sup>.

### Analysis

Analyses were conducted using SPSS (IBM SPSS Statistics for Windows. 22.0 ed. Armonk, NY, 2013). T-tests, Pearson’s Chi-square tests and correlations were used to assess bivariate associations. Separate multiple linear regression analyses were used to test each hypotheses, each time controlling for SSB intake and household income as these factors have been found to influence motivation and behaviour around SSB intake<sup>22, 23</sup>. All variables were entered into the model together using the forced entry (Enter) method.

### Results

The survey was completed by 237 parents (*M* age =37 years (*SD*=6.5), 90% women, 87% White British). Respondents had between one and five children, with ages ranging from 1 to 17. The sample was largely well educated (60% had completed higher education after

finishing secondary school), with a median household income of £30,000-£39,999 (38,600 USD – 51,500 USD; range <£10,000 to >£90,000 (<12,900 USD to >116,000 USD)).

The majority of parents (n=217, 92%) were aware of the SDIL, and 44% felt they had noticed increases to the price of soft drinks as a result of the levy. Over half of parents (57%) were in support of what the SDIL was trying to accomplish (only 10% were not, the remainder were neutral), but 29% of the full sample considered it to threaten their freedom to choose. Eleven percent reported negative emotional reactions, indicative of psychological reactance.

Participants perceiving an increase in the cost of soft drinks since the SDIL were less supportive of it (M support =4.40 (SD=1.91) for those perceiving a cost increase vs M support =5.51 (SD=1.50) for those perceiving no increase,  $p<0.001$ ), perceived greater threat to their freedom to choose (M=3.13 (SD=1.29) vs 2.19 (SD=1.07),  $p<0.001$ ) and showed more reactance (M=2.19 (SD=1.49) vs 1.23 (0.70),  $p<0.001$ ). Perceived cost increases were more likely to be reported by those with higher SSB intake (M SSB intake = 2.15 drinks/week (SD=3.02) vs 1.36 (SD=2.09),  $p=0.02$ ). Nonetheless, there was no difference in intention to reduce purchasing and consumption according to perceptions of changes in cost (M=2.99 (SD=1.06) vs 3.00 (SD=0.02),  $p=0.92$ ).

Parents in households at or below the UK average income were more likely to report noticing increased prices (Chi-square = 32.83,  $p<0.001$ ). In addition, parents with higher vs lower incomes showed greater support for the SDIL (M higher income =5.30 (SD=1.17) vs M lower income =4.44 (SD=2.18)) and autonomous motivation for change (M higher income =5.18 (SD=1.38) vs M lower income =4.32 (SD=1.64)), and lower reactance (M higher income =1.42 (SD=0.96) vs M=2.13 (SD=1.54)).

There was some evidence that parents' causal attributions about obesity were associated with their intentions to reduce purchasing and consumption, as set out in Table 1: perceiving an environmental cause for obesity (i.e. too much availability of unhealthy options) was negatively associated with motivation and intentions to change. Somewhat surprisingly, given the SDIL is considered an environmental-level intervention, greater

Table 1. Means and associations between SSB intake and psychosocial study variables.

	Sample Mean value (SD)	Bivariate correlations					
		Support	Threat	Reactance	Intention	Autonomous motivation	Controlled motivation
SSB intake (servings/week)  (range: 0-21)	1.70 (2.6)	-.10	.14	.07	-.14*	-0.18**	-0.05
Parents' causal attributions for obesity							
Individual causes	2.78 (0.91)	.09	-.06	-.06	-.10	.01	.01
Environmental causes	2.34 (0.79)	-.28***	.11	.07	-.05	-.26***	-.18**
Genetic causes	3.77 (0.77)	-.07	-.10	.03	-.06	.03	-.09
Reactance (range 1-5)	1.55 (1.11)	-0.71***	0.69***		-0.15 <sup>‡</sup>	-0.34***	-0.29***

Notes: \* p<0.05, \*\*p<.01, \*\*\*p<0.001, <sup>‡</sup>p=0.05. All statistics are based on the full sample of 237 participants. SSB = sugar sweetened beverage, SD = standard deviation.

agreement in environmental causes of obesity were negatively associated with support for the SDIL.

#### Children's SSB consumption

Reported children's intake of SSBs was much lower than intake of non-sugar-sweetened drinks (1-2 portions/week vs 7-8 portions/week), but this was not associated with a parent's perceived threat to personal freedoms from the SDIL or psychological reactance. Forty-one percent of parents reported an intention to change SSB purchasing or consumption (their own or their child's) over the coming month. However, parents reporting higher SSB consumption by their children reported lower autonomous motivation and intention to change.

#### Predictors of psychological reactance

The regression model predicting reactance to the SDIL from perceived threat to freedom and obesity attributions was significant in explaining 52% of the variance ( $R^2=0.52$ ,  $p<.001$ ).

Greater reactance was predicted by perceiving a greater threat against one's freedom to choose (standardised beta ( $\beta$ ) =0.69 (SE=0.05),  $p<.001$ , 95% CI [0.53, 0.73]) and by a lower household income ( $\beta$  =-0.17 (SE=0.16),  $p<.001$ , 95% CI [-0.81, -0.18]). Obesity attributions were not significant predictors of reactance.

#### Predictors of autonomous motivation

Autonomous motivation to reduce family SSB intake was significantly, negatively predicted by reactance ( $\beta$  =-0.28 (SE=0.09),  $p<0.001$ , 95% CI [-0.54, -0.17]), endorsement of environmental determinants of obesity ( $\beta$  =-0.26 (SE=0.13),  $p<0.001$ , 95% CI [-0.72, -0.22]) and SSB intake ( $\beta$  =-0.15 (SE=0.04),  $p<0.05$ , 95% CI [-0.16, -0.01]), and positively predicted by income ( $\beta$  =0.15 (SE=0.27),  $p<0.05$ , 95% CI [0.05, 1.10]). The model explained 23% of the variance in autonomous motivation ( $R^2=0.23$ ,  $p<0.001$ ).

## Predictors of intentions of purchasing and consumption behaviour

Intention to change was significantly predicted by autonomous ( $\beta = 0.20$  (SE=0.07),  $p < 0.05$ , 95% CI [0.01, 0.27]) and controlled motivation ( $\beta = 0.22$  (SE=0.08),  $p < 0.05$ , 95% CI [0.05, 0.37]).

## Discussion

This study provides a snapshot of a sample of parents' immediate perceptions and responses to the UK SDIL, and suggests that parents were aware of the introduction of the SDIL with over half supporting what it was aiming to achieve. For the majority of parents (71%), the SDIL was not perceived to threaten their freedom to make decisions for themselves, and the reported level of reactance in the sample was also low (~11%). Instead, 41% of respondents intended to take action to reduce family SSB consumption in the months following the SDIL introduction.

These findings of general support for an industry levy among the present sample are consistent with numerous studies modelling predicted responses of the public to hypothetical SSB pricing policies<sup>24-26</sup>, and with a large, representative cross-sectional study of 3104 adults conducted in the UK prior to the introduction of the SDIL<sup>2</sup>. In Pell et al's 2017<sup>2</sup> study, adult respondents reported positive expectations for the effectiveness of a SDIL for changing SSB formulation (they were not asked whether it would affect their own behaviour), and accepted that there is a link between SSB intake and obesity. However, support for the levy was lower among parents of dependent children. Given that attitudes are often found to shift after the introduction of a policy<sup>27</sup>, the present study provides useful data on the reality of the attitudes of parents of dependent children after the levy's introduction. Within the present sample, support for the SDIL remained strong and despite 43% noticing a cost increase there was little evidence of a backlash (i.e., a low proportion of people reporting high reactance to the SDIL).

Studies of responses to hypothetical or proposed food taxes have shown that support increases when the revenue will be used for health-promoting purposes<sup>26, 28</sup>. As well as

framing the SDIL as a levy on producers rather than consumers, the revenue raised from it is reported to go towards increasing funding for health promotion programmes in schools<sup>1</sup>. This might help explain the generally supportive responses found in the current study, which was conducted soon after the levy was introduced and before any changes in school health programmes were evident. Future research could look to assess whether support for the levy has been influenced by the visibility to parents of the increased investment in school sports facilities and healthy breakfast clubs that the SDIL revenue has funded.

Research in the US suggests that taxing SSBs can reduce consumption in lower-income communities<sup>29</sup>. Other work, summarised in a systematic review, suggests that taxes on SSBs are equivalent, if not more effective in bringing about weight change in lower socioeconomic households<sup>23</sup>. In the present sample, families on lower incomes experienced more reactance to the policy and less autonomous motivation for change. Some of this difference may be accounted for by the nature of the taxation models included within the systematic review and other studies, some of which are more directly targeted at consumers rather than industry levies. Evidence suggests that those who would most benefit from a reduction in SSB consumption are less likely to choose to make changes and more likely to show resistance to direct health messaging<sup>22</sup>. However, income was not a predictor of intention to change consumption or purchasing patterns within the present sample; it may be that other factors (such as perceived cost increases) moderate the impact of psychosocial effects for families with lower incomes, and thus the impact on reactance and motivation are not sufficient to undermine the positive behavioural effects of the levy. This work suggests that policies which rely on parent engagement and motivating individuals to make changes may have different effects on people according to socio-economic status; as such, alternative, environmental-level policies regarding SSB consumption may be more effective in terms of reducing health inequalities.

## Limitations

A strength of this study was its timing, taking place immediately after the introduction of the SDIL, allowing us to capture parents' views when media coverage of a new policy was high and when the impact of industry and retail responses (e.g. explicit supermarket promotions of drinks with sugar content below the taxable level) would be more salient.

However, there were also limitations of this responsive approach; while the sample provided responses from a range of parents of primary school-aged children, the limited window for recruitment resulted in a relatively small sample, which was not representative of the whole UK, limiting its generalisability. The survey engine used also did not allow for the estimation of the number of people starting but not completing the survey to help estimate drop out of the study. As such, the findings are presented as a snapshot of responses rather than a definitive account of shifts in SSB intake. The study was also reliant on self-report data and used parents as proxies to report on children's dietary intake; as such, the results are likely subject to a social desirability bias and may be limited in accuracy as parents may be unable to control or monitor their children's intake at all times. Food frequency measures, of the type used in this study, are known to provide only an approximation of true intake<sup>30</sup> and it should be noted that the Beverage Intake Questionnaire, used in this study, has not been validated for secondary reporting by parents for children.

## Implications for Research and Practice

In the current study of parents of primary-school aged children, the 2018 UK soft drinks industry levy was positively perceived and its introduction prompted around 40% of parents to form an intention to change their families' SSB consumption. Further research, involving objective measurement, is needed to evaluate the impact of the levy on purchasing and consumption behaviours. By recruiting large, diverse samples, future research could valuably explore differences in the psychological and behavioural effects of the levy according to socioeconomic status.

Regarding practice, policy makers and producers alike can be encouraged by the positive reception of the SDIL among parents. Soft drinks industry was the only one to face a sugar levy in the UK, however the government has called on the food industry to reduce sugar by 20% in 10 other popular food categories (e.g. cakes, cereals, confectionary) by 2020<sup>3</sup>.

Progress towards this goal has been limited, with an overall reduction of 2.9% between 2015 (start of the sugar reduction programme) and 2018<sup>31</sup>. Applying a levy similar to the SDIL to producers of other high sugar goods could capitalise on the current support shown by parents and help reduce children's sugar intake.

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