Preferences for Sin Taxation *

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Abstract

Sin taxes have become a widely suggested policy instrument to discourage the consumption of unhealthy goods. Using surveys and experiments, we provide evidence on how people think and reason about taxes on sugary beverages. People place large weight on externality correction, and motives to correct health cost misperceptions matter more than motives to correct a lack of self-control. However, anti-paternalistic attitudes and regressivity concerns are also prevalent, which helps to explain why the majority opposes the tax, although they consider behavioral biases and externalities relevant. Explaining to individuals the idea behind corrective taxation increases the support for sin taxes significantly.

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1 Introduction

A large literature in behavioral economics suggests that many consumption decisions are influenced by biases and mistakes, such as a lack of self-control or incorrect beliefs. Behavioral biases can give rise to internalities (i.e., decision consequences the individual regrets in the long run), which can lead to over-consumption of "sin goods," such as soft drinks, fast foods, candy, marijuana, alcohol, and tobacco. Consumption of these goods can also generate externalities, for instance, through higher costs for the public health system. Economists have therefore suggested that sin taxes, intended to discourage the consumption of such goods, can improve welfare (Allcott *et al.*, 2019a,b; Gruber and Köszegi, 2001; O'Donoghue and Rabin, 2003, 2006). However, opponents of corrective taxation often argue that these instruments fall disproportionately on the poor and are a paternalistic intervention in individual decisions. In many countries, there is an ongoing debate regarding the introduction of sin taxes, for example, on sugary products and other foods and consumables considered unhealthy.

Although sin taxes have become an often proposed policy to correct behavioral biases and externalities, it is still unclear as to how individuals think and reason about such instruments. In this paper, we provide survey and experimental evidence on people's views and understanding of sin taxes. We analyze the factors and considerations that drive individuals' sin tax preferences, and whether explaining to individuals how corrective taxation works affects their policy demand.

To do so, we investigate attitudes on a policy that has received particular attention among policymakers and economists: taxes on sugar-sweetened beverages (SSBs). Taxes on SSBs aim to reduce high sugar intake, which is considered one of the main culprits of the "global obesity epidemic" (WHO, 2000). We study preferences for SSB taxes in the US, a country in which SSB consumption and obesity are particularly prevalent.[1] Drawing on a broadly representative sample of more than 3,800 US citizens, we elicit respondents' preferences with regard to the introduction of SSB taxes at the federal level, as well as for some selected US states, using both unincentivized and incentivized preference revelation techniques.

Methodologically, we build on Stantcheva (2020, 2021) and decompose policy views into the factors that speak in favor of or against sin taxes from a theoretical perspec-

[1]The US has the second highest per capita consumption of SSBs in the world, with more than 150 liters consumed per capita per year and more than 70 percent of the population overweight or obese. To date, seven U.S. cities have taxes on SSBs, but there is no such tax at the federal or state level.

tive. We derive them from a simple behavioral model of sin taxes, where we distinguish between efficiency-related factors (internalities and externalities), distributional concerns (regressivity), self-interest (related to one's own SSB consumption), and broader ethical considerations (e.g., paternalism). Our survey elicits respondents' views on these factors. For instance, regarding internalities, we ask respondents to what extent they agree that sugary beverage consumption is driven by a lack of self-control and that SSB consumers misperceive the health costs of sugar. With respect to externalities, we ask whether respondents think the consumption of sugary beverages imposes costs on others in society. Moreover, we survey their beliefs that SSB taxes are regressive in that they fall more heavily on the poor. From these answers, we create indices summarizing respondents' views on the different underlying aspects of SSB taxation. By testing whether these factors predict support for SSB taxes, we can descriptively shed light on the factors that individuals employ when reasoning about sin taxes and determine those factors that matter most for them. We compare the results with answers from open-ended questions, grasping individuals' first-order reasoning about SSB taxes (Ferrario and Stantcheva, 2022).

In addition, a random subsample of respondents is shown instructive explanations and graphical visualizations (cartoons) of the idea of corrective taxation. After conveying the general case for SSB taxes (explaining that SSB consumption can have negative health consequences, and that SSB taxes aim to reduce overconsumption), our main treatments explain the concepts of externalities and internalities in a between-subjects design. Thus, we provide experimental variation in the understanding of the main economic rationales of corrective taxation, and trace their effects on policy preferences.

Our main findings are as follows. Policy views are mostly driven by general normative considerations, including ideas of efficiency-related corrective taxation and distributional concerns. In contrast, egoistic factors play only a minor role. Those who agree that internalities and externalities are prevalent demonstrate greater support for SSB taxes. Among the efficiency arguments, people place relatively large weight on externality correction, and motives to correct health cost misperceptions matter more than motives to correct a lack of self-control. Remarkably, SSB tax supporters prefer tax rates close to the optimal tax calibrations by Allcott *et al.* (2019a). However, our results reveal that reasoning regarding sin taxes is also driven by broader political values, such as anti-paternalist and libertarian views. These views are quite common and they are associated with strong aversions against SSB taxes. In addition, a significant share of respondents perceives SSB taxes as regressive and not very effective. Together, this explains why the majority of our respondents do not

support SSB taxes, even though they agree that behavioral biases and health externalities are empirically relevant phenomena.

Moreover, we observe partisan differences in policy views, with Democrats more open toward SSB taxation. These differences are partly driven by Democrats being more concerned about externalities and perceiving the tax as more effective. However, we observe the largest partisan gaps in fundamental ethical considerations, with Democrats being more in favor of paternalistic intervention. Overall, we observe a "polarization of values" instead of a "polarization of reality" (Alesina *et al.*, 2020).

Nevertheless, as our experimental interventions reveal, the SSB tax preferences are malleable and can be causally shifted by information intervention. Explaining to individuals the ideas of corrective taxation yields a sizable gain in the support of sugary beverage taxes, independently of party affiliation. For example, conveying to individuals that sugary drinks generate externalities increases the share of individuals favoring a sugary drinks tax by five percentage points, which amounts to almost 40 percent of the partisan gap between Republicans and Democrats. Moreover, the interventions also shift the general openness to paternalistic interventions. Our results suggest that the explanation and rationalization of a policy's goal can foster policy support and reduce concerns towards behavioral policy intervention.

This paper contributes to a nascent literature that uses survey experiments to study how individuals reason about economic policies. In pioneering work, Stantcheva (2021) demonstrates that preferences regarding income and estate taxes are strongly correlated with social preferences, such as distributional and fairness concerns, but that efficiency concerns (perceived efficiency costs of taxation) play only a minor role.[2] We also find that broader ethical views are crucial in shaping individuals' policy support. By contrast, efficiency concerns turn out to be important in the policy domain we analyze: individuals employ externality and internality considerations in their attitudes toward commodity taxation; and explaining these economic concepts alters policy support.

While there is an extensive literature on preferences for redistribution and income taxation, empirical evidence on preferences for corrective taxation is still scarce.[3] An

[2]Relatedly, Stantcheva (2020) extends the analysis to reasoning about health insurance and shows that views on universal health insurance are very polarized and that explaining its efficiency and redistribution effects does not shift the support for it.

[3]The literature illustrates that preferences for redistribution depend, among other things, on beliefs about inequality (Kuziemko *et al.*, 2015) and intergenerational mobility (Alesina *et al.*, 2018), cultural factors (Luttmer and Singhal, 2011), and attitudes towards meritocracy (Almås *et al.*, 2020).

important exception is a growing strand in environmental economics, studying views on carbon taxes meant to internalize the externalities of carbon emissions.[4] Most related to our paper, Dechezleprêtre *et al.* (2022) decompose attitudes toward climate policies and find that, among others, preferences for carbon taxes are driven by effectiveness beliefs, regressivity, and self-interest concerns. In contrast to this strand of literature, we study preferences for a policy, whose aim is also to correct behavioral biases and mistakes. As we reveal, people also trade off regressivity concerns against efficiency aspects for sin taxes, though egoistic concerns turn out to be of less importance.

Our paper contributes to a large and still growing literature analyzing the role of behavioral biases for policy design (O'Donoghue and Rabin, 2003, 2006; Allcott *et al.*, 2019a; Farhi and Gabaix, 2020; Haavio and Kotakorpi, 2011). By demonstrating that individuals consider behavioral biases important and that beliefs regarding misperceptions and self-control play a role in actual policy views, we underline the empirical relevance of this mostly theoretical literature. However, our analysis also reveals that many people oppose corrective SSB taxes, mainly due to anti-paternalistic views. Hence, our paper informs about the political economy barriers to behavioral tax policy. Relatedly, Allcott and Kessler (2019) demonstrate that some people have an intrinsic aversion to welfare nudges, suggesting that there can be unintended costs of behavioral interventions. We find that sin taxes can also trigger resentment (in our case fueled by concerns against interfering with choice autonomy), further indicating that the welfare effects of behavioral policies can be different from what is usually assumed in the literature.[5]

We also contribute to a burgeoning literature on the topic of paternalism (Bartling *et al.*, 2022; Jacobsson *et al.*, 2007). Most related to our paper, Ambuehl *et al.* (2021) find that 15 to 30 percent of experimental subjects are paternalists and remove tempting options from choice sets of others. In our sample of representative US citizens, we observe a similar share of around 20 percent who agree with paternalist attitudes. Regarding the motives, Ambuehl *et al.* (2021) demonstrate that paternalists believe others would be better off by behaving according to the paternalists' preferences. We also find supportive evidence of this

[4] Douenne and Fabre (2022) find that misperceptions about the impact of carbon taxes on one's budget drive opposition to the carbon tax, while Anderson *et al.* (2021) find that political ideology is an important predictor. See also the reviews in Klenert *et al.* (2018) and Maestre-Andrés *et al.* (2019).

[5] Allcott and Kessler (2019) elicit consumer willingness to pay to receive an informational nudge to reduce their energy consumption. We also employ a multiple price list method and allow for a negative willingness to pay for a donation to an organization lobbying for SSB taxes in the US. The average willingness to pay to trigger a donation is negative. This aversion does not stem from feelings of guilt or shame of personal non-compliance, but seems partly to rest on views that the policy itself violates normative standards, namely to respect decision autonomy.

"ideals-projective paternalism": Respondents' personal SSB consumption levels correlate negatively with support of sin taxes in another US jurisdiction.[6] In contrast to Ambuehl *et al.* (2021), we analyze preferences for paternalist policy allowing for a broader range of motives, including externality and distributional concerns, some of which turn out to have higher predictive power for policy views than variables related to personal consumption. Moreover, we show that paternalistic preferences are not a fixed personal trait but are malleable: they can be shifted via information provision.

2 Conceptual framework

To fix ideas and guide our empirical analyses, we provide a simple model of corrective sin taxes. The model we present covers basic insights from the optimal sin tax literature as, for example, in O'Donoghue and Rabin (2006); Gruber and Köszegi (2001); Allcott *et al.* (2019a). A special feature is that we allow policymakers to differ in their views on whether correcting for behavioral biases is justified.

2.1 A simple model of sin taxes

Consider an economy with a finite number of consumers. A consumer i can spend her net income, consisting of an endowment income y_i and a lump-sum transfer T, on a "sin good" x and on a numéraire good z. The producer prices are set to one. The sin good is levied with a per unit consumption tax $t \geq 0$. The consumer's budget constraint is given by $z_i + (1+t)x_i = y_i + T$.

Decision utility is given by

$$\tilde{U}_i := h \cdot f(x_i) + z_i, \tag{1}$$

where f is strictly concave and h is a parameter for the intrinsic benefits of sin consumption.

Experienced utility is

$$U_i := h \cdot f(x_i) + z_i - I \cdot x_i, \tag{2}$$

[6] In an external validity check of their laboratory experiments, Ambuehl *et al.* (2021) reveal that Germans who drink less alcohol exhibit more support for an increase in alcohol taxes in Switzerland. A negative correlation between consumption (resp., self-control) and support of sin taxes, which challenges voting motives of sin taxes as a commitment device (Haavio and Kotakorpi, 2011), is also found in Pedersen *et al.* (2014).

where I denotes the marginal "internal costs" of sin consumption, which the individual neglects in her private optimization.

The difference between decision and experienced utility can result from different psychological biases that individuals may have when deciding to consume goods like sugary drinks, alcohol, or cigarettes. For instance, people may not be perfectly informed about certain aspects of these goods, such as their calorie content, or they pay only limited attention to them, and therefore underestimate their true health costs. Moreover, people may have self-control problems or are prone to temptation: at the moment of consumption, they may underweigh the health costs compared to how the long-term self would have liked to weigh these costs.

In addition to internal costs, there are also external costs of sin consumption. The idea is that the consumption of goods like sugary drinks imposes costs on the health system, which have to be borne by society, instead of the individual herself. We assume that the external costs depend on the total sin good consumption in the economy. They are given by $E \sum_i x_i$, where E is the marginal externality.

Consider a social planner who forms preferences about whether to introduce a sin tax. She bases this decision on her normative views about what factors should count for social welfare. First, she has preferences regarding whether internalities should be corrected. The "normative" utility the policymaker assigns to consumer i is given by

$$V_i := \tilde{U}_i - \gamma_I I x_i, \tag{3}$$

where $\gamma_I \in [0, 1]$ is a parameter for how much weight she places on internal costs. If γ_I equals one, the policy planner wants to fully correct the internal costs; if $\gamma_I = 0$, she thinks that decision utility should be (fully) respected.

Social welfare, from the policymaker's point of view, is given by

$$W := \sum_i V_i - \gamma_E E \sum_i x_i. \tag{4}$$

where $\gamma_E \in [0, 1]$ the importance the policymaker ascribes to the externalities of sin consumption. Her policy problem can thus be written as maximizing (4) with respect to t and T, subject to the (per capita) public budget constraint $T = tx_i$ and to individual

optimization.[7] The solution to this problem gives a policymaker's most preferred tax as a function of the economy's parameters and her normative weights:

$$t = \gamma_I I + \gamma_E E. \tag{5}$$

Intuitively, a paternalist policymaker ($\gamma_I > 0$) wants to internalize the decision bias of the consumers. Therefore, she seeks to increase the price of the sin good by the marginal internality, weighted by γ_I, the extent to which she thinks internalities should be corrected. If the policymaker is a Pigouvian ($\gamma_E > 0$), she wants an additional price increase by the marginal external cost E, multiplied by γ_E, the degree to which she thinks externalities are to be offset. Finally, a libertarian or non-interventionalist puts neither weight on internalities nor externalities ($\gamma_I = \gamma_E = 0$) and therefore prefers a sin tax of zero.

Our simple model provides some comparative statics that we can bring to data. Generally, if people form their policy preferences for sin taxes following a corrective logic, then their policy views should depend on their beliefs about how severe internalities and externalities are. In particular, those who agree that self-control problems or health cost misperceptions are large should have a stronger preference for SSB taxes. Similarly, those who believe that externalities matter more, should prefer higher tax rates. By regressing people's SSB tax preferences on their views on the underlying aspects, we can learn something about their agreement with Pigouvian and paternalist values. Moreover, we expect a positive interaction effect of people's stated agreement with paternalistic views and their perceptions of behavioral biases on their SSB tax preferences.

2.2 Extension: Heterogeneous consumers

While the model of homogeneous types and the specific parametrization has the advantage of providing a reduced-form formula for the optimal sin tax, real-world policy preferences might be richer. In the following, and as in Allcott *et al.* (2019a), we assume heterogeneity in consumers' income, and we allow their taste and consumption bias to vary with income. For simplicity, we consider two income types. We derive additional insights with respect to different types of policy preferences, such as welfarist versus pure self-interested motives.[8]

[7] A consumer maximizes her decision utility (1) with respect to x_i and z_i, subject to her individual budget constraint, taking the sin tax t and transfer T as exogenously given. The policymaker anticipates consumer optimization when deciding on the sin tax and the transfer.

[8] All proofs are delegated to Appendix A.1.

2.2.1 Regressivity

Assume that there are two equal-sized groups of individuals, the poor and the rich: $y_r > y_p$. Revenues from sin taxes continue to be distributed back to the individuals in the form of lump-sum transfers. The policy problem of a welfarist can be stated as follows,

$$\begin{aligned} \max_{t,T} \quad & W := \alpha G_p(V_p) + (1-\alpha) G_r(V_r) - \gamma_E E \cdot (x_p + x_r) \\ \text{s.t.} \quad & T = t/2 \cdot (x_p + x_r) \quad \text{and individual optimization,} \end{aligned} \tag{6}$$

where G_i are monotonically increasing non-linear functions of V_i, and α is the Pareto weight the policy planner assigns to the poor. The marginal social welfare weights we define as $g_p := \alpha V_p'/\lambda$ and $g_r := (1-\alpha)V_r'/\lambda$, where λ is the Lagrange multiplier associated with the government budget constraint, and V_i' denotes the first derivative of normative utility with respect to net income. They measure the social value (from the policymaker's perspective) of a marginal unit of composite consumption for a consumer, measured in terms of public funds.

A solution to (6) must satisfy

$$t = \frac{1}{\lambda}\gamma_E E + \gamma_I \frac{g_p I_p \frac{\partial x_p}{\partial t} + g_r I_r \frac{\partial x_r}{\partial t}}{\frac{\partial x_p}{\partial t} + \frac{\partial x_r}{\partial t}} + \frac{(x_p - x_r)(g_p - 1)}{\frac{\partial x_p}{\partial t} + \frac{\partial x_r}{\partial t}}. \tag{7}$$

The first two terms in (7) represent the externality and internality correction motive of the social planner, respectively.[9] The major difference to (5) is that now the internality terms are weighted by the marginal social welfare weights (and by how elastic a consumer's sin consumption is). The intuition is as follows. A social planner with paternalist motives ($\gamma_I > 0$) wants to make the consumers internalize the marginal health costs they neglect, and therefore prefers a higher price on the sin good, the larger the behavioral biases are.[10] If she wants to redistribute utility from the rich to the poor ($g_p > g_r$), the optimal tax rate is ceteris paribus higher the larger the relative behavioral bias of the poor, as then the poor will benefit relatively more from the internality correction of the sin tax.

[9] The right-hand side (RHS) of (7) is a function of the tax rate, so (7) is a fixed-point equation. If the types are identical and receive the same Pareto weights, and if the G_i functions are linear, the RHS of (7) and (5) coincide. The optimal tax of (5) is therefore nested in (7). Condition (7) is a two-type counterpart of condition (12) in Allcott *et al.* (2019a).

[10] As $\partial x_r/\partial t < 0$, the second term in (7) is weakly positive.

However, redistribution motives do not necessarily increase the sin tax. If for a given behavioral bias the poor consume more than the rich due to a larger taste for the sin good, the last term in (7) is negative as the marginal welfare weights average to one at the optimal tax solution.[11] The intuition for this financial regressivity effect is that the sin tax tends to redistribute net income from high to low sin good consumers due to lump-sum transfers. Therefore, if the poor have higher sin good consumption, they are net payers into the tax system.

In sum, the effect of redistribution motives on the sin tax is theoretically ambiguous. Depending on whether the financial regressivity effect outweighs the benefits from internality correction, the optimal sin tax might be either higher or lower. However, we still would predict that if people happen to view SSB taxes as overall regressive, then, ceteris paribus, their preferred tax will be lower the more regressive the SSB tax is perceived to be.

2.2.2 Self-interested motives

The optimal sin tax condition (7) applies if the social planner has policy motives driven by normative considerations, such as efficiency and distributional concerns. Assume now that there is a policy planner motivated by selfish concerns instead, exclusively caring for her personal well-being. Further assume that she wants to maximize her decision utility $\tilde{U}_i$.[12]

The optimal sin tax for a purely self-interested policymaker must satisfy

$$t = \frac{x_i - \bar{x}}{\frac{\partial \bar{x}}{\partial t}}, \tag{8}$$

where $\bar{x}$ denotes the average consumption of the sin good ($\bar{x} := (x_p + x_r)/2$). Intuitively, if the policymaker has below-average consumption she prefers a positive tax as then she is a (net) benefiter from the redistributive nature of the sin tax. Otherwise, she prefers a zero tax.[13]

[11] When personalized income taxes were available, the third term would vanish, as then any undesired redistribution of net income can be offset by the income tax system.

[12] If an egoist bases her policy choices on experienced utility, anticipating that her present self is biased, she demands sin taxes as a commitment device (Haavio and Kotakorpi, 2011).

[13] Strictly speaking, above-average consumers would prefer a negative tax, but we only allow for weakly positive taxes.

We can use (8) to derive predictions specific to a pure egoistic policymaker. Her most preferred tax depends (negatively) on own her consumption levels, which would not be the case for a pure welfarist policymaker. Alternatively, and in terms of primitives, we expect a self-interested policymaker's preferred tax to decrease in her intrinsic taste for the sin good, as a higher taste goes along with higher consumption and thus with higher payments into the tax system.

3 Survey and data

3.1 Recruiting of subjects and sample descriptives

We conducted an online survey and experiment with US residents aged between 18 and 65. The survey was issued at the beginning of December 2021, using the commercial survey company Respondi. We used soft quotas for gender, age, and income to obtain a sample that is broadly representative of the US population along these dimensions. Among the 4,795 respondents that were screened in, 4,270 respondents completed the survey. Since our survey included information treatments with longer text passages, it is particularly important that respondents read the instructions carefully. Therefore, we excluded the 5% of respondents that answered the survey the quickest, as well as participants who failed an attention check (another 4.6% of the sample).[14] This leaves us with a final sample size of 3,871 respondents.

Table C.1 provides descriptive statistics of our final sample in comparison to register data from the US Census Bureau. There are no significant differences with respect to the demographic characteristics targeted by the soft quotas (gender, age, and income). Our sample is also similar to the US population with respect to labor market status, education, and race/ethnicity, while we slightly undersample young people and those with low education, as well as Hispanics and blacks.[15] Notably, our sample is roughly representative in terms of sugar intake from soft drink consumption.[16] Table C.1 also shows that the final

[14]The attention check is shown in Appendix G.5. It is placed after the background information questions of the survey. The median completion time of the survey is about 12 minutes.

[15]The slight undersampling of individuals with less education, as well as of Hispanic and Black minorities is not unusual for online surveys (see, e.g., Stantcheva (2021)).

[16]Our respondents report consuming 0.89 SSBs on average per day, which amounts to 35.8g of sugar. These figures are in line with results obtained from Allcott *et al.* (2019b), who calculate that the average American adult consumes 39.8g of sugar per day from SSBs using NHANES data from 2009-2016.

sample and the unrestricted sample (the sample including respondents that are screened out) do not differ systematically in terms of background characteristics.

3.2 Survey questions and design

In the following, we present the survey questions and design. Figure C.1 in the appendix provides an overview of the survey. The complete survey instructions can be found in Appendix G. The experimental part of the survey is introduced in Section 5.

3.2.1 Demographic questions

At the beginning of the survey, we elicit a range of background characteristics like gender, age, income, state, race/ethnicity, education, employment status, political affiliation, weight, and height, as well as whether respondents have children.

3.2.2 Consumption preferences and self control

We ask respondents about their SSB consumption habits, using standardized questions from the National Health and Nutrition Examination Survey (NHANES) Dietary Screener Questionnaire (DSQ). The questions ask for the frequency of sugary beverage consumption over the last 30 days. Answer categories range from "never" to "6 or more times per day". The responses can be converted to daily sugar intake from SSBs, using the scoring algorithm by the National Cancer Institute (National Cancer Institute, 2021). In addition, we let respondents self-assess their self-control over SSB consumption. Following Allcott *et al.* (2019a), we ask for agreement with the statement "I drink soda pop or other sugar-sweetened beverages more often than I should" on a four-point scale, and we define individuals as having perfect self-control if they answered "not at all." We also adapt another question from Allcott *et al.* (2019a) to survey intrinsic taste for soft drinks. Together with a measure for BMI, the questions above will be used to assess the role of self-interested motives in the demand for SSB taxes.

3.2.3 Free-text questions

Before surveying subject's beliefs and tax preferences with closed form questions, we include a free-text part in the survey. The open-ended questions are meant to elicit individuals' first-order reasoning about taxes, without priming them by the survey (Ferrario

and Stantcheva, 2022). We ask respondents about the spontaneous thoughts that come to their minds when thinking about SSB taxes, the goals they associate with them, and who they perceive to be the winners and losers of such a tax.

3.2.4 Views on the economic factors of SSB taxes

As shown in Section 2, the optimal sin tax of a welfarist policymaker depends on the magnitudes of externalities and internalities in the economy, as well as on how the tax affects poor and rich consumers. In the survey, we elicit respondents' views on these underlying economic aspects. We ask respondents to what extent they agree with the importance of the factors on a 5-point Likert scale. We randomize the sequence in which the questions occur to avoid potential order effects.

Externalities We elicit respondents' views on the pecuniary fiscal externalities of SSB consumption. Fiscal externalities are often seen as the most natural type of externalities for unhealthy goods like sugar, which generates health care costs that are shared through the public or private health insurance system (Allcott *et al.*, 2019a). In particular, we ask respondents to what extent they agree with the statement that the "consumption of sugary beverages imposes costs for others in the public health system." We also ask respondents to what extent they think that the "consumption of sugary beverages imposes costs on the society."

Internalities Internalities of SSB consumption can result from consumer biases such as incorrect beliefs and lack of self-control. To collect beliefs about health (cost) misperceptions, we let respondents rate their agreement with the statements "individuals have little knowledge about the weight implications of high sugar consumption," and "individuals are unaware of the health consequences of sugary drinks for their later life." To capture views on self-control problems, we ask respondents to what extent they agree with the statements "individuals have difficulties resisting the temptation of sugary drinks" and "individuals consume more sugar than they actually would like to."

Regressivity In the policy discussion, SSB taxes are often criticized for having distributional effects that hurt the poor. We capture respondents' agreement with this view, by asking to what extent they think that "taxes on sugary beverages hit the poor the hard-

est," and that "the burden of sugary taxes falls more heavily on the poor than on the rich."

In addition to the above main channels, we surveyed respondents' views on the effectiveness of SSB taxes with respect to "reducing sugary beverage consumption," "reducing the prevalence of overweight and obesity," as well as "raising tax revenue."

3.2.5 Policy values

Our conceptual framework shows that even if individuals agreed that internalities and externalities exist, they may not support corrective taxes due to varying normative views about the acceptability of interfering with individual choices. To capture these normative views, we measure respondents' agreement with paternalist and libertarian values.

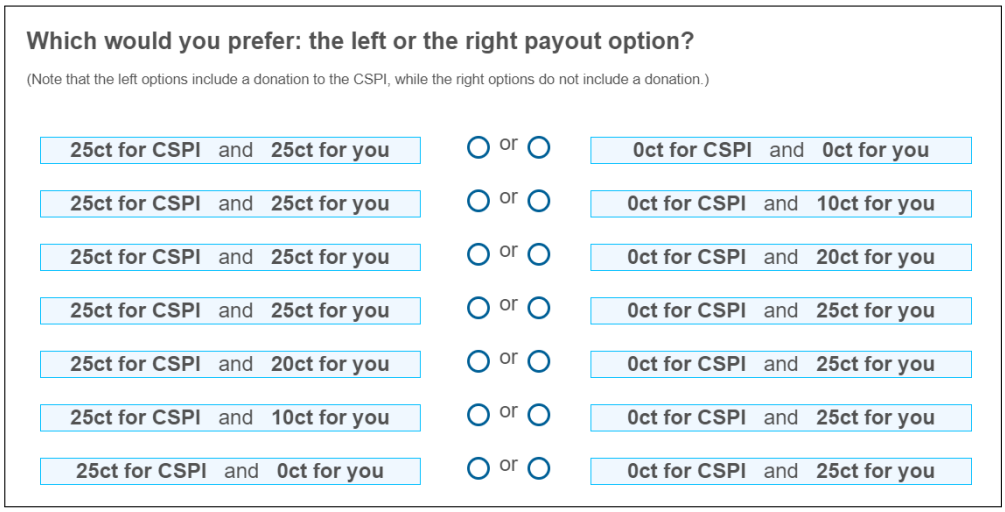
At the end of the survey, we include a module that asks respondents to state their level of agreement with the legitimacy of paternalism and state intervention in general. We designed twelve items in order to capture their political values regarding these topics. To identify the underlying political values that drive responses, we perform an exploratory factor analysis (see details in Appendix E).

The factor analysis reveals that the political values reflected in the statements are indeed best represented by two factors. We construct two equal-weighted indices: "paternalism" (based on eight items) and "libertarianism" (based on three items). Paternalism describes the willingness to restrict other people's choice autonomy with the intention to improve their well-being (see, e.g., Bernheim and Taubinsky, 2018). It is represented by statements, such as, "limiting a person's autonomy to promote her own good is acceptable" and "intervening with a person's choices is justified if the person interfered with will be protected from harm." The libertarianism index measures respondents' general aversion to government intervention, in particular, whether they agree that "the government should not intervene in the economy," "taxes that have the purpose to change behavior are wrong," and "the state should not interfere with what people eat or drink."

3.2.6 Preferences for SSB taxes

Stated preferences To elicit stated preferences, we ask respondents: "Do you favor or oppose introducing a federal tax on sugary beverages in the United States?" Answers are given on a 5-point Likert scale from "strongly oppose" to "strongly favor."

Figure 1: Multiple price list for donation decision (screenshot)



Notes: Figure shows the multiple price list to determine the donation WTP. Respondents have to select one option in each row. One row is randomly drawn for payout. The switching point determines one of the seven ranges that the WTP can fall into.

Moreover, we ask for a respondent's preferred tax rate: "If the US was to introduce a federal tax on sugary beverages: How large would you like the tax to be (in US cents per liter)?" Here, respondents were asked to use a slider from 0 to 120 cents per liter. We inform subjects that the average price of a sugary beverage in the US is about 114 cents per liter (Allcott *et al.*, 2019a). Even though providing subjects with numbers can have framing effects, we wanted to provide subjects with some orientation regarding the unit of measurement and market prices. The slider includes zero such that individuals who personally prefer a zero tax rate can express this view.

Incentivized preferences from donation decisions In our questionnaire, respondents are also given the opportunity to decide on a donation to the Center for Science in the Public Interest (CSPI). The CSPI is a non-profit consumer advocacy organization that advocates for safer and healthier food choices. We inform subjects that one of the current goals of the CSPI is to lobby for the introduction of a federal tax on sugary drinks in the US.[17] The amount respondents are willing to give up to induce a donation to the CSPI

[17]The mission statement of the CSPI states that "our recent work includes securing introduction of the SWEET Act, a federal excise tax on sugary drinks (...)."(Center for Science in the Public Interest, 2021b) The SWEET Act would introduce a federal excise tax of up to 3ct per ounce (Center for Science in the

can thus be considered an incentivized preference measure for their attitudes towards the introduction of SSB taxes.

Figure 1 shows the multiple price list that we give the respondents. Using the multiple price list we can bound a respondent's willingness to pay (WTP) for a 25ct donation to the CSPI.[18] As individuals may have a strict aversion against SSB taxes, we also allow for negative WTPs. The WTP is negative if the individual is willing to give up money to prevent us from donating 25ct to the CSPI. Ultimately, for respondents whose choices in the mulptiple price list are internally consistent, we determine a respondents' WTP for 25ct donation to the CSPI to fall into one of the seven ranges $(-\infty, -25]$, (-25,-15], (-15,-5], (-5,0], [0,5), [5,15), [15,25), $[25, \infty)$. For inner ranges, we assign a subject the midpoint of a WTP range. Subjects who never switch in the multiple price list are assigned the corresponding endpoint of the scale.[19]

Although our preference revelation method is coarse, the use of only seven questions in the multiple price list keeps the approach implementable in an online survey. More details on the WTP measure are provided in Appendix D.

The spectator perspective In our survey, we also ask individuals about their support for the introduction of an SSB tax in a US federal state they do not live in. In particular, subjects were asked to state their preferences for SSB taxes in California. If the respondent lives in California, we ask for preferences for SSB taxes in Pennsylvania.[20] Unlike the federal tax in the first outcome measure, the tax in another state would not directly affect the respondent as she is put into the perspective of a more impartial spectator. This question helps us to provide robustness checks on whether preferences for SSB taxes are driven by normative views, abstracting from one's immediate personal involvement.

Public Interest, 2021a). We do not mention this number to avoid setting anchors about how large a tax should be and just inform subjects that the CSPI supports the introduction of SSB taxes in the US.

[18] Allcott and Kessler (2019) employ a similar method to measure the WTP to receive feedback on one's energy consumption compared to others (a social comparison nudge).

[19] For instance, a respondent with a WTP in the interval $(-25, 15]$ is given a WTP of -20ct, and a person in $[25, \infty)$ obtains a WTP of 25ct.

[20] We selected these states because in both of these states city-level taxes on SSBs exist (California: e.g., Berkeley and San Francisco, Pennsylvania: Philadelphia).

4 How do people feel and think about sin taxes?

In this section, we analyze individuals' views and their reasoning about sin taxes. To that end we use observations from individuals not receiving the experimental interventions, giving us a broadly representative sample of more than 1,000 US citizens. We will first present the results of our open-ended questions, which inform about people's first-order views and reasoning. We will then use data from the closed-form answers and study individuals' baseline preferences over SSB taxes. Afterward, we analyze views on the underlying aspects of SSB taxes and assess their predictive power for individuals' policy preferences. Finally, we address partisan gaps in attitudes toward sin taxes.

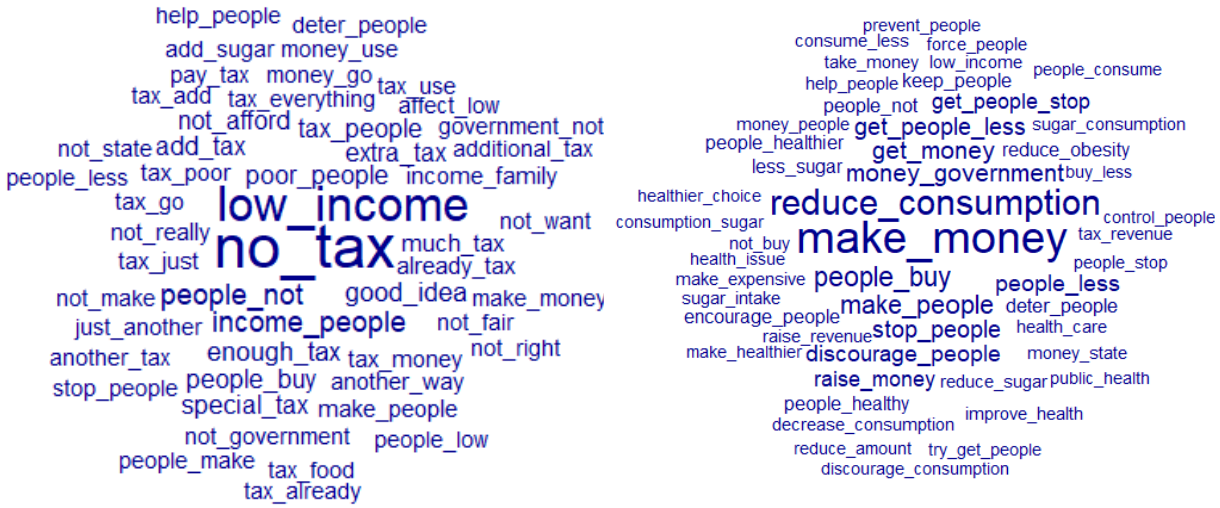
4.1 Text analysis of first-order considerations

Figure 2a provides a graphical representation of the expressions the respondents used the most when asked about the "main considerations" that come to their mind when they think about sugary drink taxes. The figure shows word clouds for the most frequently mentioned 2-grams. 2-grams are sets of two words appearing next to each other in the texts written down by the respondents.[21] The font size of the words in a word cloud is proportional to the number of times the 2-gram appears in the responses. Respondents mostly express a negative attitude toward SSB taxes ("no tax"), which is accompanied by general tax aversion ("enough tax", "tax everything") and concerns about the regressivity of such a tax ("low income", "hurt poor"). Positive views of the tax, stating that it may improve welfare ("good idea", "help people"), are less often mentioned.

Figure 2b visualizes the answers to the free-text question asking respondents about what they think are the goals of a tax on SSBs. The most frequently mentioned goals refer to "reduce consumption" and "make money," suggesting that respondents have split views on the purpose of an SSB tax. In fact, respondents often understand the tax as a way to induce behavior change ("stop people," "reduce sugar") with the goal to improve health ("healthier choice," "reduce obesity"), which is in line with a corrective view of SSB taxes. Other individuals view SSB taxes mainly as a way to generate tax revenue ("money government," "get money"). Some respondents consider SSB taxes as patronizing ("control people," "force people"), thereby expressing reservations against paternalistic

[21] In Appendix F, we describe in detail how the text data is pre-processed and the 2-grams are obtained.

Figure 2: Word clouds of free-text responses



(a) Main considerations

(b) Goals of SSB tax

Notes: Graph shows word clouds of the main considerations regarding an SSB tax (Panel (a)) and its perceived goals (Panel (b)).

intervention. These patterns are reinforced when looking at opinions about who would be the beneficiaries and losers of an SSB tax.[22]

Taken together, the free-text questions reveal that individuals' spontaneous thoughts about an SSB tax are often critical, mostly because the tax is perceived as regressive, and because of a general skepticism against additional taxes and paternalistic state intervention. Ideas of corrective taxation to change behavior for the sake of improving health are also mentioned but appear less often.

4.2 Baseline preferences for SSB taxes

In this section, we present descriptive results on SSB tax preferences based on our closed-form answers.

[22]Figure F.1a in the appendix shows that the most frequently mentioned winner of the tax is the "government," followed by "no one". Some respondents also mention that "obese people," "low income," or "health" would benefit. Looking at the potential losers (see Figure F.1b), many respondents are concerned about the regressivity of the tax ("low income," "poor"), but also "everyone" and "no one" are popular answers.

4.2.1 Stated preferences

Figure 3a shows the distribution of answers to our stated preference question. About 34 percent of the respondents express a weak preference for introducing taxes on soft drinks in the US.[23] A majority of respondents (65.9 percent) state that they are (strictly) opposed to SSB taxes (42.1 percent answer "strongly opposed" and 23.8 percent "opposed").

Figure 3b displays individuals' preferred levels of SSB taxes. Over the whole population, the average preferred tax rate is 14ct per liter. This tax rate is smaller compared to taxes introduced in some US regions, for example, in Berkeley (1ct/oz, amounting to 34ct per liter) or Philadelphia (1.5ct/oz tax, resp. 51ct per liter). However, among those who "favor" or "strongly favor" the introduction of SSB taxes in the US, the average preferred tax is 35ct per liter, which is comparable to the optimal SSB tax of 34ct to 71ct per liter, as calculated by Allcott *et al.* (2019a). Those who express that they "neither favor nor oppose" SSB taxes prefer an SSB tax of about 20ct per liter, and for those who state that they "oppose" the introduction of SSB taxes, the mean preferred tax is still about 10ct per liter. The answers to the preferred taxes thus depict a somewhat more favorable view of SSB taxation.[24] Overall, however, the support for the introduction of an SSB tax strongly correlates with the most preferred tax rate, cross-validating the measures.

4.2.2 Incentivized preferences

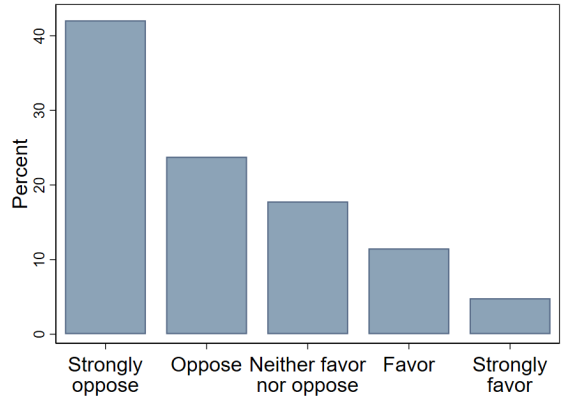
In the following, we provide descriptives for our incentivized preference measure, the WTP for the donation to a public health organization lobbying for the introduction of a federal SSB tax in the US. To construct the WTPs, we only use observations from individuals who have at most one switching point (84.8 percent of respondents). Among these, we exclude those who switch from the right to the left option when going down the multiple price list, as this would imply an implausible aversion to money (5.0 percent of responses). In total, we are thus left with 80.5 percent of untreated observations (N=819) that are plausible and internally consistent.[25]

[23] 7.8 percent of the respondents answer "neither favor, nor oppose", 16.3 percent either "favor" or "strongly favor".

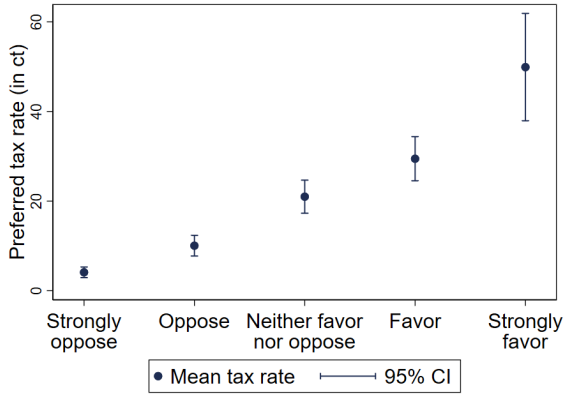
[24] This pattern is consistent with former findings that views on taxation can be less extreme in response to more concrete as opposed to abstract questions (Roberts *et al.*, 1994)

[25] Column (3) of Table C.1 shows that subjects with an internally consistent multiple price list do not differ meaningfully from those in the full and final sample in terms of observables.

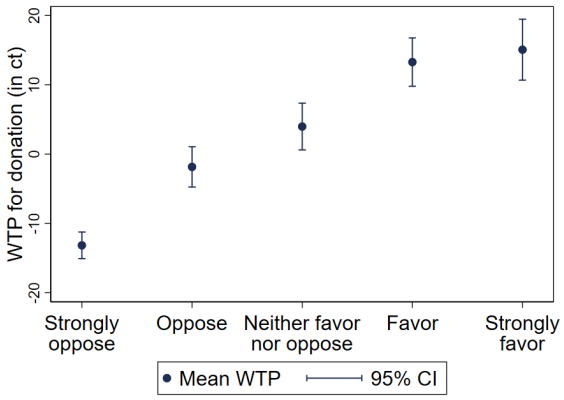
Figure 3: Preferences for sin taxes in the control condition



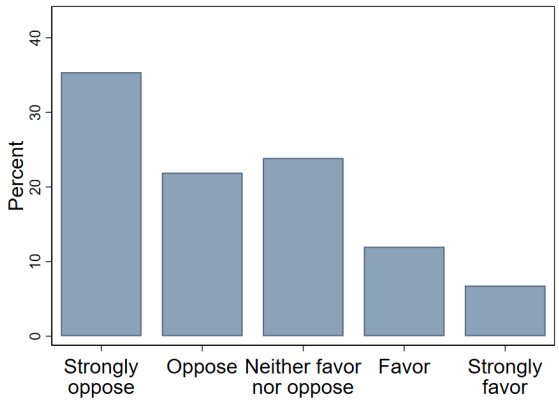
(a) Preference for federal tax



(b) Preferred tax rate by preference



(c) Donation WTP by preference for tax



(d) Preference for tax in another state

Notes: The figure shows preferences for SSB taxes in the control condition ($N = 1017$). Panel (a) plots whether individuals favor or oppose the introduction of a federal SSB tax, and Panel (b) plots the preferred tax rate (in bins of 5 cents). Panel (c) displays the average willingness to pay (in ct) for a 25ct donation to the CSPI. Panel (d) plots whether individuals favor or oppose the introduction of an SSB tax in a state other than the one they live in (California or Pennsylvania).

Figure C.8 in the appendix illustrates the cumulative distribution function (CDF) of our WTP measure. The vast majority of respondents is not indifferent to inducing or preventing a 25-cent donation to the CSPI.[26] Around 30 percent of the subjects have a strictly positive WTP—these subjects are willing to give up at least 10ct to trigger a donation of 25ct. By contrast, almost half of the respondents (47.5 percent) have a strictly

[26]Only 16.1 percent are assigned a WTP of -2.5ct or 2.5ct, which would be consistent with payoff maximization (see the shaded area in Figure C.8).

negative WTP. Interestingly, 42 percent are willing to forego even the maximum personal payout (25ct) to prevent the donation, that is, they have a WTP of less or equal to -25ct. Hence, the polarization of policy views expressed in the free-text answers also translates to the incentivized preference measures.

What is more, 36.4 percent have a weakly positive WTP, which is comparable to the results from the non-incentivized preferences where about one-third of the respondents express a weak preference for introducing taxes on soft drinks in the US. Indeed, Figure 3c shows that the WTPs are positively correlated with answers to the stated preference question, showing that stated preferences for sin taxes are aligned with incentivized behavior in our survey.

4.2.3 Correlation of tax preferences with demographics

Figure C.2 in the appendix shows how tax preferences correlate with demographics. Older, richer, and more educated individuals are significantly more in favor of a federal SSB tax. There are no significant differences by gender, race/ethnicity, labor market status, or parental status. There are, however, strong differences by political affiliation: Republicans are 0.36 standard deviations less in favor of a federal tax than Democrats, which is a larger gap than the difference between income and education groups. In Section 4.6, we study the partisan gap in reasoning about sin taxes in detail.

All the following regressions will control for demographic background characteristics and political affiliation.

4.3 The underlying economic aspects of SSB taxes

The underlying economic aspects of corrective taxation, such as externalities and internalities, are well documented in the economics literature. Little is known, however, about the perceived importance of these phenomena. Do individuals believe that SSB consumption generates externalities? Do individuals perceive behavioral biases to play a role?

4.3.1 Views on the main economic channels: Externalities, internalities and regressivity

A number of studies have estimated high health cost externalities from obesity and argue that high sugar consumption is one of the main culprits of this phenomenon.[27] Figure 4 shows that about 54 percent of the respondents agree with the statements that the "consumption of sugary beverages imposes costs for others in the public health system" and that the "consumption of sugary beverages imposes costs on the society." Thus, according to our survey, a majority of US households find externalities from SSB consumption empirically relevant.

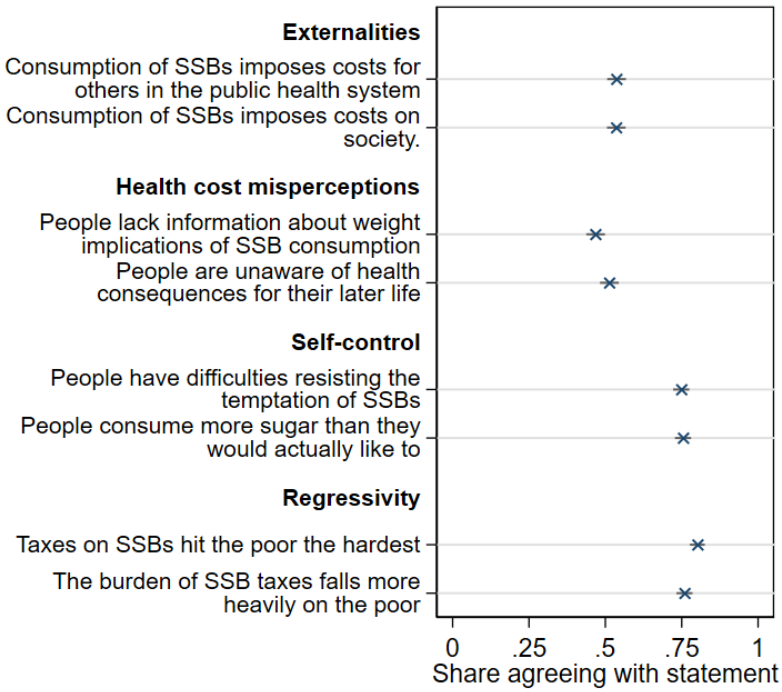
Regarding internalities, a number of studies suggest that individuals are not fully informed about the health implications of their food choices (e.g., Bollinger *et al.*, 2011; Cawley *et al.*, 2021), and that individuals lack self-control when choosing between healthy and unhealthy food items (e.g., Sadoff *et al.*, 2020; Allcott *et al.*, 2019a).[28] In our survey, about half of the respondents agree that "individuals have little knowledge about the weight implications of high sugar consumption" and that "individuals are unaware of the health consequences of sugary drinks for their later life." In addition, about three out of four respondents agree that "individuals have difficulties resisting the temptation of sugary drinks," and that "individuals consume more sugar than they actually would like to." Hence, individuals perceive internalities, especially self-control problems, to play a role in soft drink consumption.

Taxes on SSBs are often criticized for being regressive. As argued by Gruber and Köszegi (2004) and Allcott *et al.* (2019a) and shown in Section 2.2.1, the financial regressivity must however be weighed against the potential welfare gains from correcting internalities, such that poorer households may also benefit from SSB taxes. According to our data, US households seem to greatly believe that SSB taxes are regressive rather than progressive: more than three out of four respondents agree with the statements that the "burden of sugary taxes falls more heavily on the poor than on the rich" and that "taxes on sugary beverages hit the poor the hardest."

[27] Cawley and Meyerhoefer (2012) and Wang *et al.* (2012) estimate that between 80 and 90 percent of the obesity-related medical treatment costs are borne by others through the public health insurance system and not by the individuals themselves. For a critical discussion of the back-of-the-envelope calculation of health externalities from sugar intake, see Allcott *et al.* (2019b).

[28] Allcott *et al.* (2019a) provide empirical estimates of behavioral biases in SSB consumption. Using a counterfactual consumer approach, the authors show that American households would consume about one-third less in soft drinks if they had perfect self-control and the nutritional knowledge of dietitians and nutritionists.

Figure 4: Agreement with main economic aspects



Notes: The figure shows the share of respondents in the control condition who agree or fully agree with the given statement with 95% Wilson confidence intervals.

4.3.2 Effectiveness of SSB taxes, self-interested motives, and paternalism

The effectiveness of SSB taxes depends primarily on the price elasticity of demand for SSBs. Studies using naturally occurring price variation find demand for SSBs to be relatively price elastic (see, e.g., Allcott *et al.* (2019a); Dubois *et al.* (2020)). Policy evaluations of local (city-level) taxes in the US provide more mixed evidence (e.g. Cawley *et al.*, 2019a,b), presumably due to cross-border shopping (Seiler *et al.*, 2020). This suggests that SSB taxes, at least when administered at a federal level (which is our focus), can be effective in reducing soft drink consumption.[29] There is less evidence regarding the impact of SSB taxes on overweight and obesity, but some studies argue that the impact of SSB taxes on weight outcomes is limited due to substitution to other caloric beverages (Fletcher *et al.*, 2010; Aguilar *et al.*, 2021). As shown in Figure C.3, 41 percent of respondents expect that

[29]Pre-post analyses of federal taxes in other countries suggest that SSB taxes reduce purchases and consumption (e.g., Colchero *et al.*, 2017; Schmacker and Smed, 2020). However, these studies do not have a geographical control group.

an SSB tax leads to an at least moderate reduction in SSB consumption, whereas 33 percent expect an at least moderate effect on overweight and obesity. Hence, our respondents seem to believe that taxes are more effective with respect to consumption than with respect to weight outcomes. Overall, however, the majority of respondents view SSB taxes as not very effective: Most believe that the introduction of a tax on sugary drinks would reduce SSB consumption and overweight and obesity "a little" or "none at all."

Regarding self-interested motives, almost 70 percent of respondents state that they have an intrinsic preference for sugary drinks by stating that they "like somewhat" or "like a great deal" the taste and generally enjoy drinking sugary drinks like cola, soda, pop, etc. According to our model of purely self-interested policy preferences, these consumers should prefer a lower SSB tax. Models of behavioral policy demand predict that individuals who are sophisticated about their self-control problems may demand sin taxes as a commitment device to combat their own overconsumption (Haavio and Kotakorpi, 2011).[30] In our sample, about 59 percent of respondents agree at least "somewhat" with the statement "I drink soda pop or other sugar-sweetened beverages more often than I should."

A sometimes voiced concern against SSB taxes is that they interfere with a person's decision autonomy. Ambuehl *et al.* (2021) find in a lab experiment that 15 to 31 percent of subjects are willing to remove tempting choices from other subjects' choice sets and that these paternalistic choices also predict support for real-world paternalistic policies like SSB taxes. Figure C.4 shows that paternalistic attitudes are of similar magnitude among the US population. For instance, 15 percent of the respondents agree with the statement that "limiting a person's autonomy to promote her own good is acceptable," and 27 percent find that "intervening with a person's choices is justified if the person interfered with will be protected from harm." 21 percent of individuals have a paternalism index larger than 0.5, which means that those individuals agree on average with paternalist views.[31]

In contrast, people are more split in their opinions about the general legitimacy of state intervention. While only 29 percent of the respondents agree that "the government should not intervene in the economy," 47 percent express the view that "taxes that have the purpose to change behavior are wrong," and 65 percent say that "the state should not

[30]For example, Gruber and Köszegi (2004) find evidence that smokers report being happier after cigarette taxes increased, and Sadoff *et al.* (2020) find that consumers take up the commitment to remove unhealthy foods from their choice set.

[31]As described in Appendix E, the paternalism index consists of eight statements related to paternalistic intervention. It is scaled to be between zero and one by subtracting the theoretical minimum and dividing by the possible range. If this index is larger than 0.5 an individual agrees on average with paternalistic statements.

interfere with what people eat or drink." This pattern suggests that state interventions in food choices are seen particularly critically.

4.4 Decomposing policy views on SSB taxation

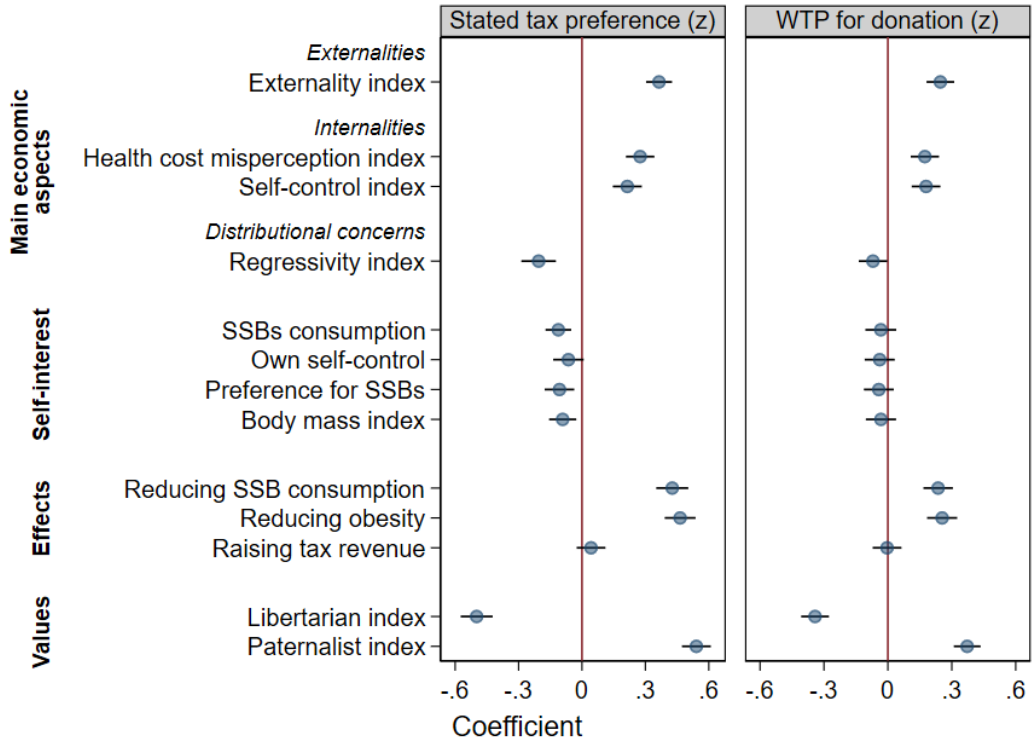
If individuals agree that a certain factor is empirically relevant, this does not automatically mean that they think it should be addressed from a policy perspective. To assess whether factors are constitutive of policy preferences, we need to link them to respondents' policy views.

In what follows, we do so by analyzing the relative predictive power of views on the underlying economic aspects and effects of SSB taxes for policy preferences. In particular, we will regress our measures for SSB tax preferences on the variables capturing the various economic views and reasonings, controlling for an array of background characteristics. To make the coefficients comparable, we z-standardize the variables of interest by subtracting the control sample's mean and dividing it by the standard deviation. When using indices, we take the average of the standardized items and z-standardize the index again.

The left panel of Figure 5 shows the results for stated policy preferences. The plotted coefficients stem from separate OLS regressions, in which we use a stated policy index, summarizing views on the introduction of the federal tax and its level, as the dependent variable. As can be seen, the four indices capturing the main economic rationales—externalities, internalities, and regressivity—are all significantly correlated with SSB tax preferences. In particular, higher scores on the externality index go along with higher scores on the stated policy index. Likewise, both the view that individuals lack knowledge about the health consequences of SSBs and the view that individuals lack self-control in their SSB consumption are positively associated with preferences for the tax. In contrast, individuals who agree that the tax is regressive have a lower preference for the tax. Thus, all these factors have the sign as predicted by our simple model of corrective taxation.

As to the relative predictive power, externalities have the largest coefficient. A one standard deviation increase in the agreement that externalities are relevant increases the approval of the tax by 0.36 standard deviations, which is about the same magnitude as the gap between Democrats and Republicans. A one standard deviation increase in the health cost misperception index increases the policy index by 0.28 standard deviations, while the agreement with the self-control index increases it by 0.21 standard deviations. In

Figure 5: Correlations with policy preferences for SSB taxes



Notes: Graph shows coefficients and 95% confidence intervals from separate regressions of the stated policy index and the WTP for donation on the respective variables. All regressions control for the background characteristics from section 4.2.3. Except for the controls, all variables are z-standardized. Only the control group is used for the estimations.

addition, believing that SSB taxes are regressive decreases their support by 0.21 standard deviations.

The self-interested motives consistently show the smallest coefficients. Higher SSB consumption is associated with lower preferences for an SSB tax, which is also the case for a higher BMI and a stronger taste for SSBs. The signs are in line with standard egoistic reasoning, according to which high SSB consumers should oppose a tax on SSBs since it would make them financially worse off. Overall, the coefficients related to personal consumption are relatively small, and some are insignificant. From a standard neoclassical view of tax preferences (e.g., Meltzer and Richard, 1981), individuals' reasoning about SSB taxes is driven surprisingly little by purely self-interested motives.

If sin taxes were not able to discourage sin consumption, there would be no case for them on externality or internality grounds. We thus expect people's beliefs about the effectiveness of SSB taxes to be positively related to SSB preferences. According to Figure 5, this is the case. In fact, beliefs about the effectiveness belong to the strongest predictors of SSB tax preferences, further indicating that efficiency concerns play a role.

Finally, the paternalism and the libertarianism indices are the most predictive of SSB tax preferences. A one standard deviation increase in the libertarianism index is associated with a 0.50 standard deviation decrease in the preference for the tax. A one standard deviation increase in the paternalism index is associated with a 0.58 standard deviation higher preference for the tax. This suggests that broader political values play a major role in people's reasoning about SSB taxes, which is in line with our results from the free-text analysis.

In Table C.4, we interact the political values with the main economic aspects. The value indices are scaled to vary between zero and one.[32] Hence, the base category in Panel A measures the impact of the economic rationale for a non-paternalist (index equals zero), while the interaction measures the impact for a strong paternalist (index equals one). As the theory predicts, variation in the perceived severity of health cost misperceptions and self-control problems does not significantly predict policy preferences for non-paternalists, while it does for paternalists. Perceived externalities also predict preferences for non-paternalists, but more so for paternalists. In Panel B, we observe a similar pattern for the libertarianism index. Similarly, those who are skeptical about state intervention in general, are less in favor of the tax, even if they acknowledge the existence of externalities and internalities.

The right panel of Figure 5 shows the marginal effects of the factors when using the (z-standardized) willingness to pay for a donation to an organization supporting SSB taxes as the dependent variable. The results mirror by and large the results for the stated preferences. What stands out are again the coefficients on the externality index, the effectiveness variables, and the normative political values; none of the self-interested motives are statistically significant.

In Tables C.2 and C.3 in the appendix, we show the results from regressing the stated policy index and the willingness to donate jointly on all economic factors. While demographic controls and political affiliation alone have relatively little explanatory power,

[32]The value indices are scaled by subtracting the theoretical minimum and dividing by the possible range.

adding the economic factors increases the R^2 substantially. Adding the presumed effectiveness of the tax increases the explanatory power further, but externalities, internalities, and regressivity remain statistically significant. In addition, the pattern regarding the relative predictive power of externalities versus internalities is confirmed: the coefficient on the externality index is almost twice as large as that for the health cost misperception index, while the coefficient on the self-control index is always substantially smaller than that of the health cost misperception index (and in some regressions not statistically different from zero). Furthermore, variables related to personal consumption are not strongly associated with tax preferences, even when controlling for political attitudes and the economic factors.

4.5 Robustness: preferences for SSB taxes in another state

Figure 3d shows subjects' support for taxes in a state other than the one they live in (either in California or, if they live in California, in Pennsylvania). Although more subjects are indifferent about the tax and fewer subjects state being strongly opposed, the plot looks remarkably similar to their approval of the federal tax in Figure 3a.

In Figure C.5 in the appendix we show a coefficient plot for the same variables used in Figure 5, but now the dependent variable is the z-standardized score related to the question about the introduction of SSB taxes in another federal state. The results of this decomposition are similar to those previously mentioned (also in terms of magnitude): again, the externality index, the regressivity index, effectiveness beliefs, and especially the political value indices (paternalism and libertarianism) belong to the strongest predictors. The similarity of the decomposition results for the federal tax and the state tax that would only apply for other individuals supports the finding that sin tax preferences are greatly shaped by general normative considerations, and less by self-interested motives.[33]

4.6 Partisan gaps

In the following, we shed more light on whether there are partisan gaps in individuals' attitudes toward SSB taxes.

[33]The coefficients on the egoistic factors remain negative and are more often statistically significant compared to Figure 5. A negative correlation between tastes for the sin good and support for a sin tax suggests that people are ideals-projective paternalists (Ambuehl *et al.*, 2021). These paternalists would like to discourage consumption since they project their own preferences on others. In line with this, Ambuehl *et al.* (2021) also find that individuals with a lower BMI are more likely to support sugary drink taxes. We show that this negative correlation also extends to SSB consumption and tastes more directly.

4.6.1 Partisan differences in first-order considerations

We first check whether there are partisan differences in free-text responses. To that end, we use a keyness analysis which tests whether there are differences in the usage of 2-grams between Democrats and Republicans.

Figure C.6a plots the 2-gram keyness scores for the "main considerations" regarding the implementation of an SSB tax. The figure shows the χ^2 statistics under the null that the propensity to use a 2-gram is the same for Democrats and Republicans.[34] Republicans express significantly more often a general aversion to implementing a new tax ("enough tax," "tax everything") and are more likely to perceive the SSB tax as patronizing ("control people"). Democrats, in contrast, more often voice concerns about the potential regressivity of the tax ("poor people") and are more likely to mention ideas of corrective taxation ("discourage people," "improve health"). A similar picture surfaces in the responses to the questions about the perceived goals (see Figure C.6b) and the potential winners of the tax (see Figure C.6b).[35]

4.6.2 Partisan differences in closed form answers

Next, we consider potential partisan differences in closed-ended survey questions.

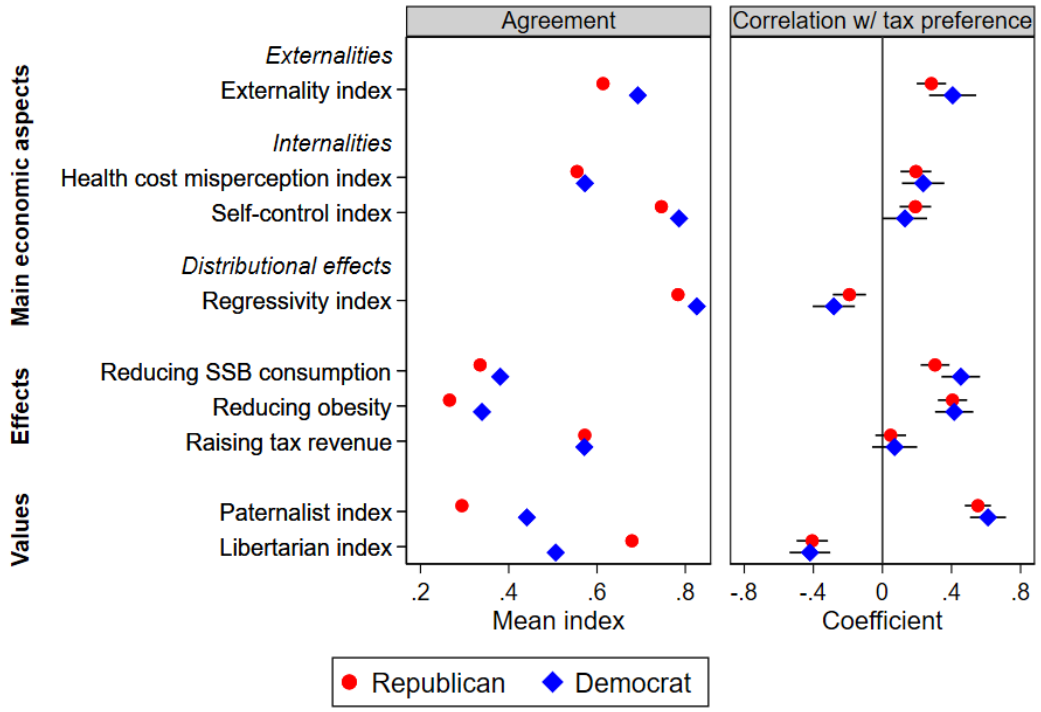
The left panel of Figure 6 plots the average scores on the indices summarizing the different views underlying SSB taxes, split by political affiliation. In line with the answers to the free-text questions, Democrats agree somewhat more with the corrective motives of the tax, in particular with the externality index ($p < 0.01$) and the self-control index ($p < 0.05$). Similarly, Democrats agree more that the tax is regressive ($p < 0.05$). Yet these differences are small in magnitude.

There are somewhat more distinct but still comparable views on the effectiveness of SSB taxes, with Democrats believing slightly more that SSB taxes are effective. However, there is a stark contrast when it comes to policy values. Democrats score a lot higher on

[34]Keyness scores are based on the relative frequencies of 2-grams and indicate how characteristic a certain 2-gram is for one group in relation to the other. If a 2-gram is common, but is used relatively equally by the two groups, it does not receive a high keyness score. For further details and a discussion of keyness analyses, see Ferrario and Stantcheva (2022).

[35]Democrats are significantly more likely to state that the tax is meant to incentivize behavior change ("reduce consumption") and to alleviate the health costs ("much sugar," "public health," and "reduce diabetes"). Republicans more often mention "none" or "government"/"politicians" as winners of the tax, while Democrats are more likely to mention "everyone" and "obese people."

Figure 6: Partisan differences in attitudes and beliefs



Notes: The left panel shows the sample mean of the respective indices. The indices are standardized on a scale from 0 to 1 by subtracting the theoretical minimum of the aggregated responses and dividing by their possible range. The right panel shows coefficients from regressions of the z-standardized preference for the federal tax on z-standardized indices. Regressions are run separately for Republicans and Democrats. Only the control condition is used.

the paternalism index, and Republicans substantially higher on the libertarianism index.[36] Hence, Democrats and Republicans differ substantially in their views regarding the scope of state intervention.

Interestingly though, all factors, the economic factors as well as normative policy values, are similarly predictive of the SSB tax, irrespective of political affiliation (see the right panel of Figure 6). There are some differences in these correlations with respect to efficiency factors (externalities), the distributional aspects (regressivity), and the effectiveness of SSB

[36]While 33 percent of Democrats have a paternalism index larger than 0.5 (i.e., on average they agree with paternalist statements), only 15 percent of Republicans do. In contrast, 43 percent of Democrats have a libertarianism index larger than 0.5 compared to 72 percent of Republicans.

taxes, which are slightly more predictive of the tax policy index for Democrats. However, these differences are not statistically significant.

Taken together, we do not see that Democrats and Republicans overly disagree about the importance of the underlying economic aspects of SSB taxes. Moreover, they weigh these factors similarly in their reasoning. By contrast, there are stark partisan gaps in views regarding the role of the state, with Democrats more likely to agree with paternalistic views, while Republicans are more skeptical of state intervention in general. In a nutshell, there does not seem to be a strong "polarization of reality" (Alesina *et al.*, 2020), but instead a strong polarization in the basic normative views about the legitimacy of (paternalistic) state intervention.

5 Can information treatments shift sin tax preferences?

We have shown that preferences for sin taxes are not just driven by concerns for economic welfare, but also by broader policy and normative views, including general attitudes toward government intervention and party affiliation. Does this imply that preferences for sin taxes are non-malleable? In this section, we analyze whether explaining to individuals the theoretical ideas of corrective taxation can causally shift the political support for SSB taxes.

5.1 Experimental design

In our surveys, we randomize subjects into receiving different instructional materials consisting of verbal texts, a cartoon, and an incentivized quiz. All instructions include explanations about the key vantage points of corrective SSB taxation: first, that there can be overconsumption of SSBs related to their negative health consequences, and second, that taxes on SSBs serve the purpose of discouraging SSB consumption.

What varies across our treatments is the explanation of why consumption of SSBs can be inefficiently high. For one group of subjects, we convey that the health consequences of SSB consumption entail external costs for the public health system (externality treatment). For other subjects, we explain the concept of internalities, either that people may underestimate the health costs of SSB consumption (lack of knowledge treatment) or that individuals

evaluate these costs in relation to the benefits of soft drinks inconsistently over time (lack of self-control). In a further treatment, we do not provide respondents with additional information about the source of inefficiency in SSB consumption, but instead we point to the distributional consequences of sugary beverage taxes by explaining to subjects that sin taxes can be financially regressive (regressivity treatment).

The purpose of our treatments is instructional, rationalizing the ideas of corrective taxation. Each instruction highlights a certain aspect of sugary drink taxes, not necessarily featuring this aspect alone.

5.2 Information treatments

The information treatments are the following:

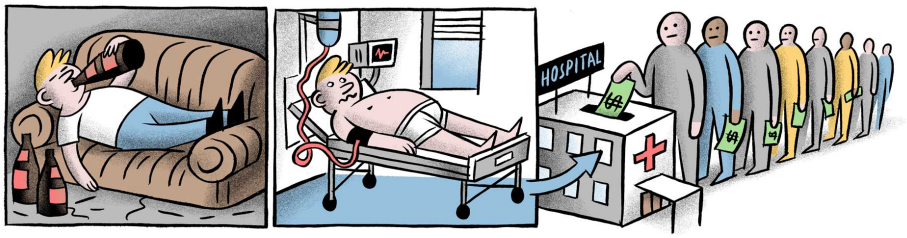
Externalities treatment We explain to respondents that the health consequences of routinely consuming SSBs impose costs on the larger society through the public health system. To rationalize this idea, we explain that the medical costs of treating the diseases associated with excessive SSB consumption typically exceed what individuals contribute to the health insurance system. Hence, the health costs of SSB consumption are not only paid for by the individuals themselves, but also by others. After visualizing this argument with a cartoon (see Figure (7a)), we ask respondents to estimate the share of obesity-related health costs borne by others. Respondents earn 50ct if their response is within three percentage points of what researchers found.[37]

Health cost misperception treatment In this treatment, we explain to subjects that people may not have perfect knowledge of the health costs of their SSB consumption, which may lead to overconsumption. We illustrate this argument with an example of a person who decides on her sugary drink consumption and who underestimates the health implications of soft drinks. The misperception makes the person consume more sugary drinks than what is good for herself in the long run (see also Figure (7b)). Afterward, we let respondents estimate the share of individuals who underestimated the weight implication of sugary beverages in our pre-survey.[38]

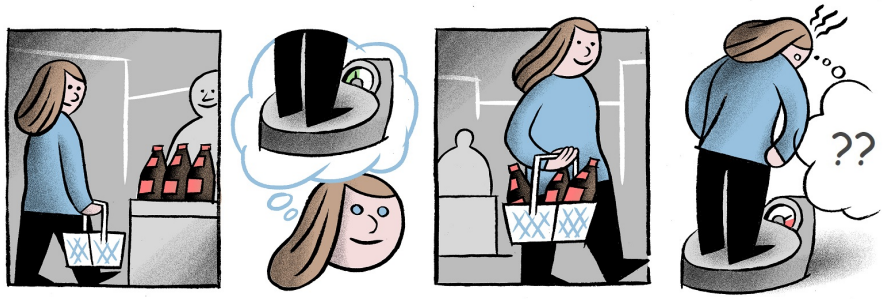
[37]Respondents answer how many out of 100 US Dollars obesity-related health costs are borne by others (on a slider from 0 to 100 Dollars). Their answer is compared to Cawley and Meyerhoefer (2012), who estimate this number to be 88 US Dollars. Feedback is given at the very end of the survey.

[38]In the pre-survey, we asked respondents to guess how much weight an average person would gain by drinking an additional can of Coca Cola per day over a period of three years. In the main survey, we ask

Figure 7: Cartoons included in the instructions of the respective treatment

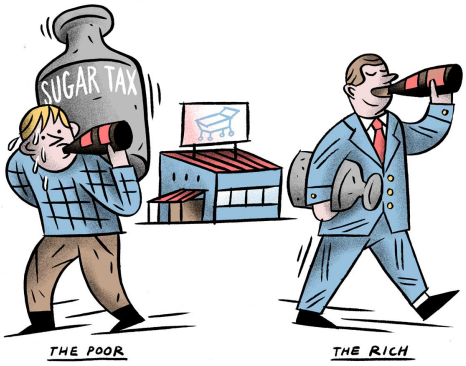


(a) Externality treatment



(b) Health cost misperception treatment

(c) Self-control treatment



(d) Regressivity treatment

Self-control treatment This treatment captures the idea of time-inconsistent preferences for sin goods: in the heat of the moment, an individual values the sin good (relative to its cost) differently than she would from a detached perspective. To convey this idea to the subjects, we provide them with an example of a person who plans to reduce her consumption of SSBs. However, every time she is offered a sugary drink, she gives in to the temptation and indulges in sugary drinks. Hence, she regularly consumes more than she thinks she actually should (see Figure (7c) for the cartoon). Finally, we ask subjects to estimate the share of individuals in our pre-survey who agree "at least somewhat" with the statement that they drink more sugary drinks than they should.

Regressivity treatment As in the other treatments, we state that taxes on sugary beverages are being discussed due to the negative health consequences of sugary drinks. However, we point out that the burden of an SSB tax is higher for poorer than for richer consumers since the expenditure for sugary beverages makes up a larger part of the income for the poor. The corresponding cartoon shows a poor SSB consumer who carries a larger tax weight on his shoulders than a rich consumer (see Figure 7d). We then ask respondents for their belief about how much higher the share of income is that a household with less than $10,000 annual income spends on soft drinks compared to a household with $100,000 to $150,000 annual income.[39]

Conjectures We conjecture that explaining the main ideas of corrective taxation increases individuals' support for SSB taxation. We hence expect preferences for SSB taxes to be higher in the externality and internality treatments. In contrast, for the regressivity treatment, the expected treatment effect is less clear. The regressivity treatment explains that poorer individuals would pay a higher share of their income in sin taxes. However, as with the other treatments, the general idea of corrective taxation is also explained (that SSB taxes discourage the consumption of an unhealthy food item). This may shift channels that lead to higher support of sin taxes (e.g., beliefs about externalities and self-control problems). Therefore, as also a counterargument to SSB taxation is presented, at least we

respondentes to guess the share of the pre-survey respondents who underestimate by at least 10 percent "what nutrition scientists predict" the weight gain would be. We use calibrations by Hall *et al.* (2011) to estimate the true weight gain. The share of respondents underestimating the weight implication in the pre-survey is 42 percent. Respondents in the main survey receive a bonus payment of 50ct if their estimate is within three percentage points of this number.

[39]The answer is compared to results in Allcott *et al.* (2019a), with the true number being 50. As in the other treatments, feedback is provided at the end of the survey.

would expect that the treatment effect on the support of sin taxes should be smaller in magnitude, compared to the other treatments.[40]

5.3 Experimental results

5.3.1 Agreement with the arguments of corrective taxation

We start out by studying whether the information treatments shift the agreement with the respective main aspect they explain. Table 1 shows the results from regressing the z-standardized indices for the economic factors on treatment indicators, controlling for background characteristics. All treatments have a strong and statistically significant effect on individuals' agreement with the respective rationale compared with the control group. That is, explaining the idea of externalities, internalities, and regressivity makes individuals agree more with the relevance of these concepts.

The table also shows that the treatments do not exclusively shift the agreement with the concepts that they primarily aim to explain. Instead, some of the treatments have spillovers on the other indices. For example, self-control, health cost misperception, and the regressivity treatment also increase agreement with the idea that sugary beverages impose externalities. Moreover, the health cost misperception treatment induces respondents to agree more that people lack self-control. These spillovers are not surprising since we explain the idea of corrective taxation in all treatments, potentially triggering people to think about other related aspects. However, it is reassuring that the economic aspects targeted by the treatments react the strongest.

5.3.2 Treatment effects on SSB tax preferences

We present the treatment effects on policy preferences in Table 2. The first column shows that the externality and the internality treatments significantly increase the preferences for a federal SSB tax, using the z-standardized stated policy index as the dependent variable. These effects are economically sizable. The externality treatment increases approval by 0.13 standard deviations, which amounts to about 36 percent of the gap between Democrats and Republicans. The internality treatments (health cost misperception and self-control) increase support for the tax by 0.12 and 0.14 standard deviations, respectively. As shown

[40]Since we expected the financial regressivity argument to outweigh the shift of other potential arguments, we preregistered a negative effect on support for the tax, relative to the control.

Table 1: Treatment effects on agreement with the economic aspects of SSB taxes

	(1) Externality index	(2) Misperceptions index	(3) Self-control index	(4) Regressivity index
T Externality	0.348***	-0.020	0.079	-0.057
	(0.045)	(0.049)	(0.049)	(0.051)
T Health cost misperception	0.238***	0.324***	0.180***	0.066
	(0.047)	(0.046)	(0.047)	(0.047)
T Self-control	0.151***	-0.062	0.176***	0.014
	(0.047)	(0.048)	(0.048)	(0.049)
T Regressivity	0.168***	-0.023	0.082*	0.226***
	(0.047)	(0.049)	(0.049)	(0.045)
Controls	✓	✓	✓	✓
Observations	3777	3777	3777	3777

Notes: The table reports treatment effects based on OLS regressions. The dependent variables are the z-standardized indices for agreement with the respective arguments. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table 2: Treatment effects on outcomes

	Federal SSB tax			Donation
	(1) Policy index (z)	(2) Favors tax	(3) Tax level	(4) WTP
T Externality	0.131***	0.041**	2.088*	3.395***
	(0.048)	(0.019)	(1.152)	(1.117)
T Health cost misperception	0.121**	0.047**	1.764	4.249***
	(0.048)	(0.019)	(1.168)	(1.117)
T Self-control	0.144***	0.040**	3.238***	2.255*
	(0.050)	(0.019)	(1.231)	(1.159)
T Regressivity	0.074	0.052***	0.136	3.029***
	(0.049)	(0.019)	(1.124)	(1.157)
Controls	✓	✓	✓	✓
Observations	3777	3777	3777	3044

Notes: Table reports treatment effects based on OLS regressions. In Columns (1) to (3), approval of the federal SSB tax is measured by the z-standardized policy index, a dummy whether a respondent favors a tax, and by the preferred tax level in US cents per liter. In Columns (4), the dependent variable is the mean WTP in cents for a 25ct donation to the CSPI. Robust standard errors are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

in Columns 2 and 3, the effects are driven by an increase in stated support for the tax and by positive (but less precise) effects on the preferred tax level. That is, explaining to respondents the idea of corrective taxation has a positive treatment effect on individuals' SSB tax preferences, both in terms of the support for introducing SSB taxes, but also on their desired tax level. Moreover, the treatments significantly increase the WTP for the donation to the CSPI, with the strongest effects for the health cost misperception treatment and weaker effects for the self-control treatment.

For the regressivity treatment, the results look different. While there is no significant treatment effect on the policy index, there is a significant positive effect on individuals' donation decisions. When using a dummy for whether an individual favors the introduction of an SSB tax as a dependent variable, the indicator for the regressivity treatment also becomes significant. Thus, there is an increase in individuals' support for introducing SSB taxes even in the regressivity treatment. However, as opposed to the other treatments, there is no effect on the desired tax rates: the treatment coefficient of 0.136 is statistically insignificant and close to zero.

We conclude that providing information about the ideas of corrective taxation increases the general approval of SSB taxes. Highlighting the different efficiency aspects of SSB taxation does not differentially affect the approval of the tax, but stressing the negative distributional consequences for the poor makes a difference for individuals' preferred level of corrective taxation.

In Figure C.8 in the appendix, we plot the pooled treatment effect on the distribution of the WTPs for a donation to the CSPI. It turns out that the treatments have a stronger effect at the bottom of the distribution compared to the top: They mainly reduce the share of respondents with a (very) negative willingness to pay. Similarly, the treatments significantly reduce the share of respondents with a WTP of -25ct and significantly increase the share with a weakly positive WTP, but do not increase the share with a WTP of +25ct (see Table C.5 in the appendix). These patterns suggest that explaining the ideas of corrective taxation predominantly affects policy preferences by reducing strong opposition against the tax.

5.3.3 Within-treatment guesses

While the main purpose of the guessing questions is to incentivize reading, the guesses can also be interpreted as an alternative measure of how severe respondents believe the

described problem to be in the US.[41] In Table C.7, we regress the dependent variables on the guesses in the respective treatments and control variables. Since we elicited theses guesses only in the respective treatments (to not exacerbate spillovers to the other treatments), analyzing these guesses yields correlational evidence.

The results show that externality beliefs are positively associated with preferences for the tax. Believing that the costs borne by others are 10 percentage points higher increases preferences for the federal tax by 0.04 standard deviations and the preferred tax rate by 1.14ct. Additionally, beliefs about health cost misperception are significantly correlated with tax preferences: believing that the share of individuals underestimating the true health costs is 10 percentage points higher increases the preference for the federal tax by 0.03 standard deviations, and the willingness to pay for the donation by 0.81ct. The guesses about self-control and regressivity are not significantly correlated with tax preferences. These results corroborate our general finding that individuals put particular weight on externalities when forming preferences regarding sin taxes, and that among the internality rationales, individuals are more inclined to correct for health cost misperceptions than for a lack of self-control.

5.3.4 Heterogeneous treatment effects

Are there partisan differences with respect to the responsiveness to our experimental intervention? In Table C.6, we test for heterogeneity in treatment effects. In Columns 1 and 2, we interact the treatment dummies with an indicator for whether a respondent identifies as Republican. While Republicans seem to respond slightly less to some of the treatments, the differences are not systematic and none of the interaction terms are significant. In Columns 3 and 4, we show that there are also no systematic differences in treatment effects with respect to income. Hence, the effects of information provision on individuals' support of SSB taxation do not depend on political affiliation or socioeconomic status. In fact, information provision seems to be similarly effective across the whole population.

5.3.5 Treatment effects on policy values

So far we have seen that explaining the economic arguments of corrective taxation can shift preferences regarding SSB taxation. Can information provision also alter individuals' general attitudes towards paternalistic intervention?

[41] We show the distribution of guesses in Figure C.7.

In Figure C.9 we plot the coefficients we obtain when regressing the paternalism and libertarianism indices on the treatment indicators, controlling for background characteristics. Not all treatment coefficients are significant, but there is quite a systematic pattern with respect to their sign: All treatment coefficients show a positive sign for the paternalism index, but a negative sign for the libertarianism index.[42] We conclude that rationalizing the ideas of corrective taxation seem to make individuals agree more with the basic premise of paternalism that interfering with individuals' decision autonomy can be normatively justified.

6 Conclusion

There is growing research interest in the question of how people think and reason about economic policy (Stantcheva, 2020, 2021). While this research mostly focuses on redistributive taxes (on income and wealth), little is known about people's attitudes towards corrective taxes aimed at redirecting behavior.

In this paper, we find that people's support for sin taxes on sugary drinks is driven by efficiency (externality and internality) reasoning, as well as distributional concerns. Self-interest considerations play only a minor role. Instead, people factor in broader normative considerations that relate to the very nature of corrective taxation to change and redirect behavior: preferences for SSB taxes are largely shaped by views on how legitimate interference with individual choices (paternalism) is perceived to be. This suggests that people evaluate policies not only with respect to their consequences, for example, on economic outcomes, allocations, and well-being. In addition, people seem to have preferences regarding policy instruments *per se*, adding a twist to standard reasoning about the trade-off between efficiency and fairness. Future research could study to which policies such "direct" preferences translate, and to what extent they may interact with the cultural and social context.

Our results show that the explanation and rationalization of a policy's goal can foster policy support and reduce fundamental opposition to government intervention. Therefore, we complement a strand of the literature showing that policy support depends on people's understanding of a policy's goals and mechanisms (Stantcheva, 2020; Dechezleprêtre *et al.*,

[42]For example, while 21 percent of individuals tend to agree with paternalist views in the control condition (i.e., they have a paternalism index of more than 0.5), the share increases to 28 percent in the health cost misperception treatment ($p < 0.05$).

2022). These results should encourage policymakers that communicating the mechanisms behind economic policy is essential for garnering support.

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Appendix

A Proofs

A.1 Proof for the optimal sin tax formulas

For given t and T, consumers maximize their decision utility (1) with respect to their budget $z_i + (1+t)x_i = y_i + T$. The f.o.c. of this maximization problem is given by

$$h_i \cdot f'(x_i) - (1+t) = 0, \tag{9}$$

which implicitly defines the demand for the sin good as $x_i = x_i(t; h_i)$. As $f'' < 0$, we have $\partial x_i / \partial t < 0$. Plugging (1), (2) and the individual budget constraint into (3), the Lagrange problem for (6) can be written as

$$\begin{aligned} \max_t \quad & L := \alpha G_p \left(h_p \cdot f(x_p) + y_p + T - (1+t)x_p - \gamma_I I_p x_p\right) \\ & + (1-\alpha) G_r \left(h_r \cdot f(x_r) + y_r + T - (1+t)x_r - \gamma_I I_r x_r\right) \\ & - \gamma_E E(x_p + x_r) + \lambda(t x_p + t x_r - 2T), \end{aligned} \tag{10}$$

with $x_i = x_i(t; h_i)$ for $i = p, r$.

The f.o.c. with respect to T is given by

$$\frac{\partial L}{\partial T} = \alpha G_p' + (1-\alpha) G_r' - 2\lambda = 0, \tag{11}$$

which implies $\lambda = \big(\alpha G_p' + (1-\alpha) G_r'\big)/2$ or, equivalently,

$$2 = g_p + g_r. \tag{12}$$

The f.o.c. with respect to t is

$$\begin{aligned} & \alpha G_p' \cdot \Big[\Big(h_p \cdot f' - (1+t)\Big)\frac{\partial x_p}{\partial t} - x_p - \gamma_p I_p \frac{\partial x_p}{\partial t}\Big] \\ & + (1-\alpha) G_r' \cdot \Big[\Big(h_r \cdot f' - (1+t)\Big)\frac{\partial x_r}{\partial t} - x_r - \gamma_r I_r \frac{\partial x_r}{\partial t}\Big] \\ & - \gamma_E E\Big(\frac{\partial x_p}{\partial t} + \frac{\partial x_r}{\partial t}\Big) + \lambda\Big[x_p + x_r + t\Big(\frac{\partial x_p}{\partial t} + \frac{\partial x_r}{\partial t}\Big)\Big] = 0 \end{aligned} \tag{13}$$

Divide (13) by λ, and use the definitions for g_p and g_r, as well as for (9) and (12). Solving for t and re-arranging gives (7). ■

A.2 The egoist's optimal tax problem

Substituting in $T = t\bar{x}$ for $x_p = x_p(t; h_p)$ and $x_r = x_r(t; h_r)$, gives $T(t) := t\bar{x}(t)$. Individual i's indirect decision utility is

$$\tilde{U}_i(t, h_i) := h_i \cdot f(x_i(t, h_i)) + y_i + t\bar{x}(t) - (1 + t)x_i(t, h_i). \tag{14}$$

We assume that $\tilde{U}_i(t, h_i)$ is stricly concave in t, that is $\frac{\partial^2 \tilde{U}_i}{(\partial t)^2} < 0$.

Proof of formula (8) and comparative statics with respect to taste
The egoist's most preferred tax has to solve $\partial U_i/\partial t = 0$. Using (9), this condition implies

$$\bar{x}(t) - x_i(t; h_i) + t \cdot \frac{\partial \bar{x}}{\partial t}(t) = 0. \tag{15}$$

Solving for t gives (8).

Define the LHS of (15) as $F(t, h_i)$. Totally differentiating (15) yields

$$\frac{dt}{dh_i} = -\frac{\partial F/\partial h_i}{\partial F/\partial t} = \frac{\partial x_i/\partial h_i}{\partial F/\partial t}. \tag{16}$$

This expression is smaller than zero due to the concavity of $U_i(t)$ and $\partial x_i/\partial h_i > 0$. ■

B Instructions of information treatments

On the following page, we ask you to answer a guessing question. You can earn additional money by guessing correctly.

[Treatment Externalities/Health costs/Self-control:] Your guess will be compared to research results. If your guess is within 3 points of what the researchers found, you will receive an additional payout of \$0.50 in panel currency.

[Treatment Regressivity:] Your guess will be compared to research results. If your guess is within 10 percent of what the researchers found, you will receive an additional payout of \$0.50 in panel currency.

References for the research results and the correct answer will be shown to you at the end of the survey.

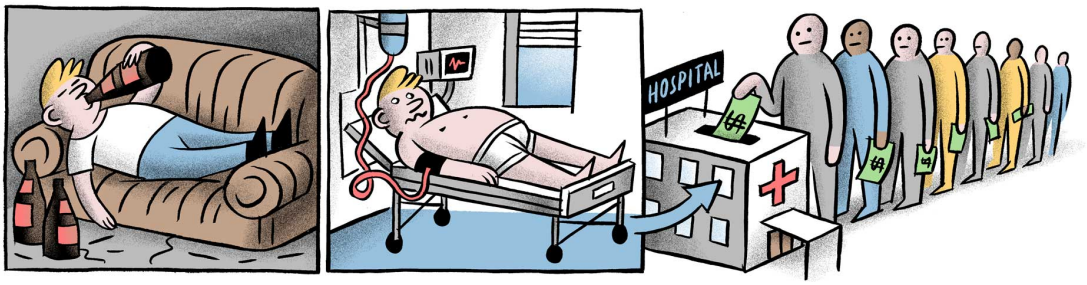
B.1 Externalities treatment

Quiz - For the correct answer you earn $0.50 in panel currency

The consumption of sugary beverages may cause negative health consequences, imposing medical costs on society as a whole. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

For example, routinely drinking sugary beverages can increase the risk of obesity, diabetes, and other chronic diseases. The resulting health costs of these diseases are not only paid for by the consumers themselves, but they are also paid by others through the public health system.

The reason is that the medical costs of treating diseases like obesity and diabetes can be substantial, exceeding the amounts that an individual with such a disease pays into the public health system. Therefore, the health costs of sugary beverage consumption are borne by all individuals who contribute to the public health system.



Your task

The consumption of sugary beverages may cause negative health consequences, imposing medical costs on society as a whole. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

Research has estimated the share of obesity-related health costs which are not borne by the individuals themselves but by others in the public health system.

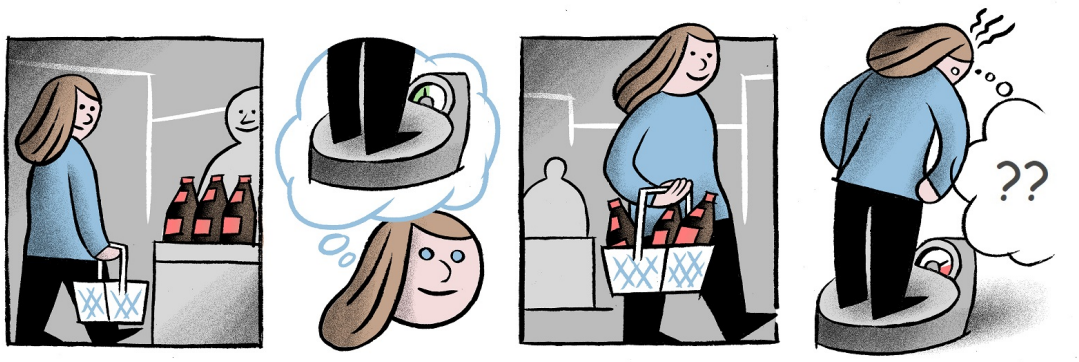
What do you guess: Out of every 100 dollars of obesity-related health costs in the US public health system, how many dollars are paid for by others instead of by the patients themselves? *[Slider 0-100]*

B.2 Health costs treatment

Quiz - For the correct answer you earn $0.50 in panel currency

Researchers argue that individuals tend to overconsume sugary drinks, compared to what is in their long-term self-interest. The idea is that people may not have perfect knowledge about the negative health consequences of sugary drinks. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

To see this, consider the following example: Jane decides how many sugary drinks she should have. However, she underestimates the long-term health costs of her sugary drink consumption. In particular, she is not fully aware that routinely drinking sugary beverages can increase the risk of obesity, diabetes, and other chronic diseases. Therefore, Jane constantly consumes more sugary drinks than what is good for herself in the long run.



Your task

We have asked a representative sample of the US population (more than 500 individuals) to estimate how much weight a person would gain by drinking one additional can (330ml) of Coca-Cola per day for three years.

To answer the question, respondents were asked to assume that the person in question is a 30-year-old individual of their own gender with average weight and height, and that the person does light activity at work and moderate physical activity at least once a week. Respondents received money if their answers matched the actual weight gain as calculated by models of nutrition scientists.

What do you guess: Out of 100 individuals in the sample, how many underestimated how much weight the person would gain by drinking an additional Coca-Cola per day for

three years? (Underestimated means that the respondent's guess was at least 10% less than what nutrition scientists predict.)

Out of 100 people, the number of people who underestimated the weight gain is: *[Slider 0-100]*

B.3 Self-control treatment

Quiz - For the correct answer you earn $0.50 in panel currency

Researchers argue that individuals tend to overconsume sugary drinks, compared to what is in their long-term self-interest. The idea is that people may lack self-control over their sugary drink consumption and often give in to temptation. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

To see this, consider the following example: Jane would like to reduce her consumption of sugary drinks because routinely drinking sugary beverages can increase the risk of obesity, diabetes, and other chronic diseases. However, every time she is offered a sugary drink, she gives in to the temptation and indulges in sugary drinks, even though she formerly did not plan to do so. Therefore, Jane constantly consumes more sugary drinks than she thinks she actually should.

Your task

We asked a representative sample of the US population (more than 500 individuals) to what extent they agree with the following statement:

"I drink soda pop or other sugar-sweetened beverages more often than I should."

The answer options were: "not at all," "somewhat," "mostly," and "definitely."

What do you guess: Out of 100 individuals in the sample, how many agreed at least somewhat with the statement that they drink more soft drinks than they should?

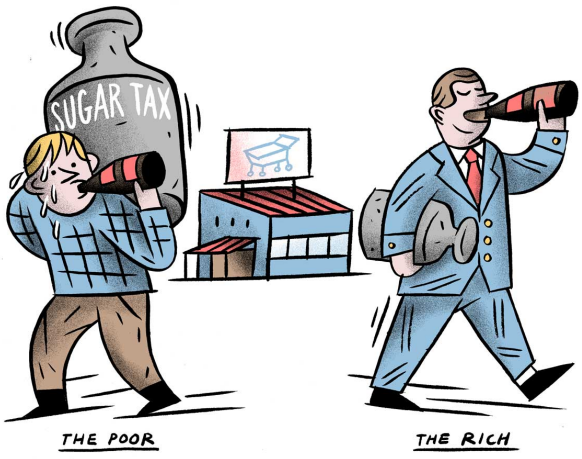
Out of 100 people, the number of people who agreed to the statement is: *[Slider 0-100]*

B.4 Regressivity treatment

Quiz - For the correct answer you earn $0.50 in panel currency

Routinely drinking sugary beverages can have negative health consequences. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

However, taxes on sugary beverages fall more heavily on the poor than on the rich. The reason is that the expenditures for sugary beverages (just like other food expenditures) make up a relatively large part of the income of the poor. Therefore, the tax burden of a sugary drink tax is higher for poorer than for richer consumers.



Your task

Research has estimated how much higher the share of income is that low-income consumers spend on sugar-sweetened beverages compared to high-income consumers in the US.

What do you guess: The share of income that a household with less than $10,000 annual income spends on soft drinks is _____ times what a household with $100,000 to $150,000 annual income spends.

C Additional tables and figures

Figure C.1: Experimental Design

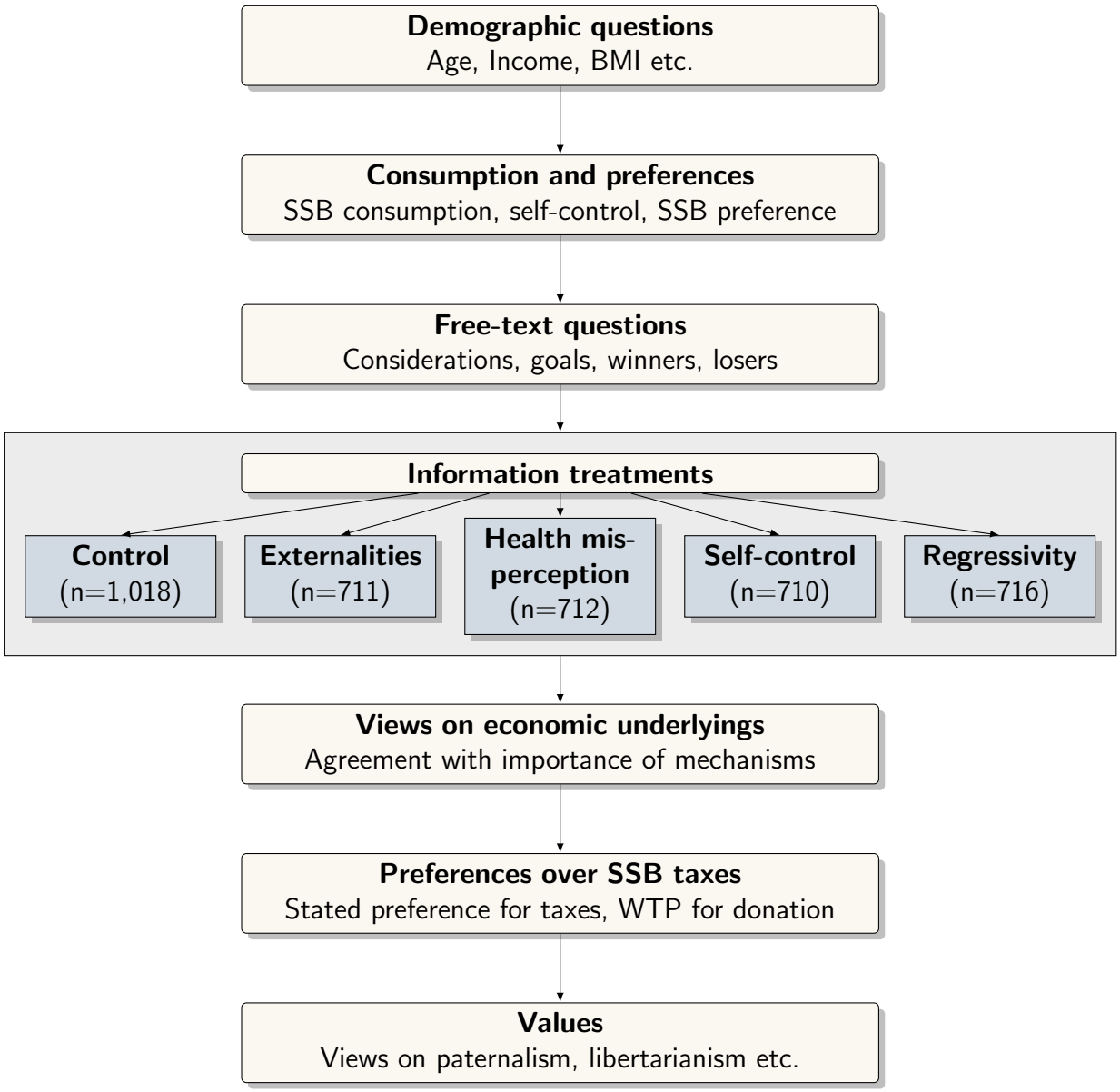
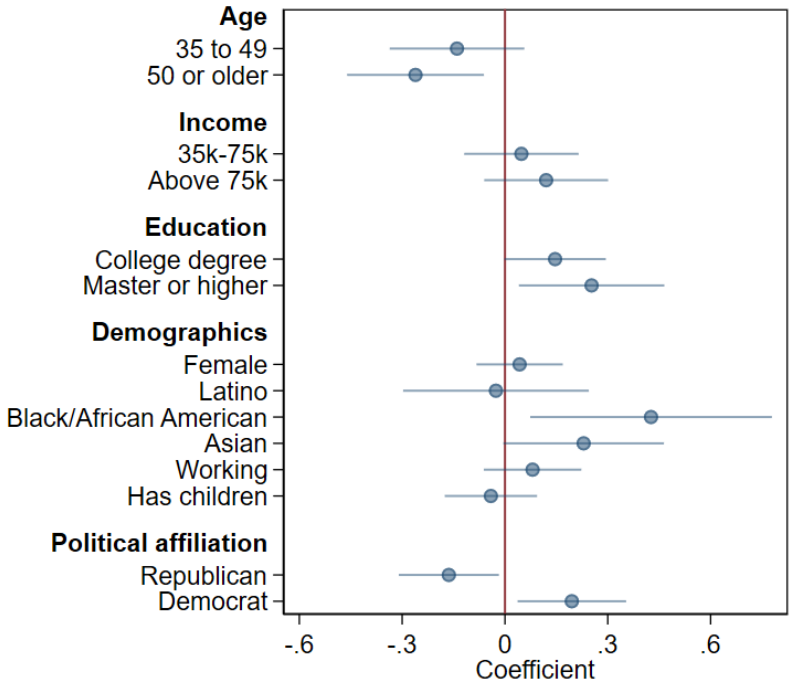


Table C.1: Descriptive statistics

	Main survey					
	Unrestricted sample	Final sample	Consistent WTP	Control group	Pre-survey	US population
Female	53.0	52.2	52.4	52.8	62.0	51.5
Household income in USD						
<35K	28.6	26.5	25.5	26.5	25.7	23.1
35K-75K	31.5	31.2	31.1	31.4	28.7	28.9
>75K	40.0	42.3	43.4	42.2	45.6	48.2
Age group						
18-29	11.3	10.8	9.6	9.5	13.0	17.2
30-49	44.7	43.8	43.4	43.8	42.0	45.4
50-65	44.0	45.3	47.0	46.7	45.0	37.6
Labor market status						
Working	65.7	66.3	66.5	64.5	67.2	73.3
Education						
No college	21.8	20.1	19.0	20.6	18.9	37.7
College degree	62.7	63.5	64.0	62.6	62.4	50.6
Advanced degree	15.5	16.4	17.0	16.7	18.7	11.7
Race/Ethnicity						
White	76.1	77.3	78.3	79.1	78.6	59.4
Latino/Hispanic	8.3	8.0	8.1	7.3	6.4	18.5
Black/African American	7.7	6.8	5.7	6.3	5.5	13.9
Asian	7.9	7.9	7.9	7.3	9.6	6.5
Observations	4795	3871	3111	1017	540	

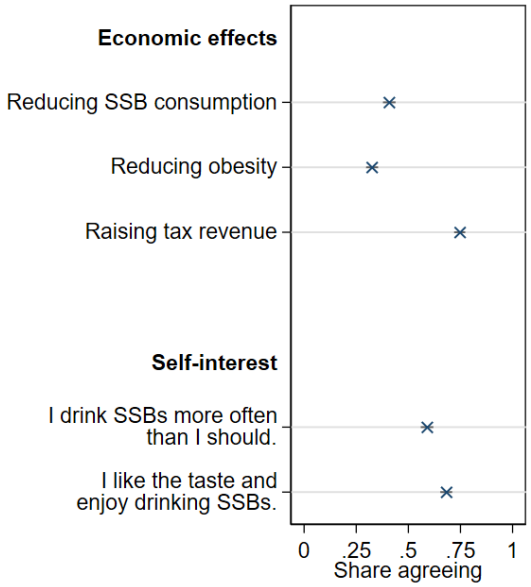
Notes: The table shows descriptive statistics of the sample. Column (1) shows summary statistics of the unrestricted sample (including subjects that were screened out and did not complete the survey), while Column (2) shows summary statistics of the final sample that we use in the analysis. Column (3) excludes subjects that did not provide a consistent price list and Column (4) zooms in on the control group. Column (5) shows summary statistics for the pre-survey. Column (6) shows statistics of the US population from the US Census Bureau and the Current Population Survey 2019 (relative shares for the US population in the considered age range 18 to 64).

Figure C.2: Correlations of policy index with demographics



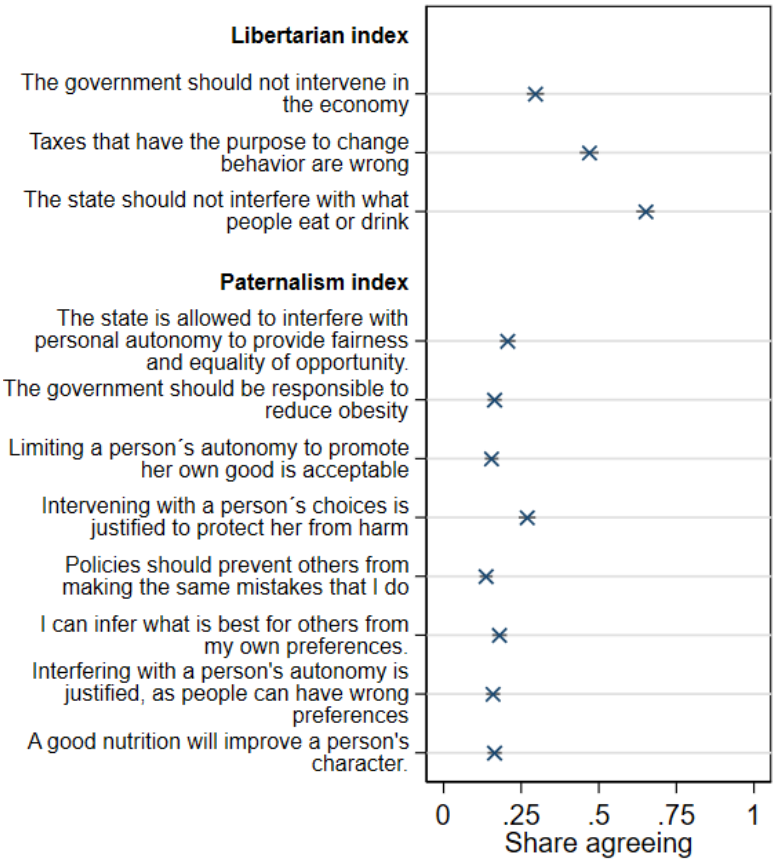
Notes: Graph shows coefficients and 95% confidence intervals from an OLS regression with z-transformed preference for a federal SSB tax (policy index) as dependent variable. Standard errors are robust. The omitted reference categories are younger than 35 (age), less than $35k (income), high-school or less (education), male/other (sex), unemployed/student (working), no children, white (race/ethnicity), independent/other (political affiliation), normal/underweight (Body Mass Index). Only the control group is used for the estimation.

Figure C.3: Agreement with economic effects and self-interested motives



Notes: The figure shows the share of individuals who agree with the given statement with 95% Wilson confidence intervals. For economic effects, this is the share of respondents who state that the SSB tax entails the described outcome "a moderate amount," "a lot," or "a great deal." For self-interested motives, it is the share that responds "somewhat," "mostly," or "definitely" to the first statement and "like somewhat" or "like a great deal" to the second statement. Only respondents from the control condition are considered.

Figure C.4: Agreement with political values



Notes: The figure shows the share of individuals who agree or fully agree with the given statement with 95% Wilson confidence intervals. Only respondents from the control condition are considered.

Table C.2: Correlations with policy index (stated preference for federal tax)

	(1)	(2)	(3)	(4)	(5)
Arguments					
Externality index		0.284***	0.270***	0.206***	0.192***
		(0.031)	(0.031)	(0.031)	(0.031)
Health cost misperception index		0.166***	0.161***	0.105***	0.101***
		(0.030)	(0.030)	(0.028)	(0.028)
Self-control index		0.033	0.040	0.024	0.031
		(0.035)	(0.035)	(0.032)	(0.032)
Regressivity index		-0.254***	-0.249***	-0.185***	-0.180***
		(0.035)	(0.035)	(0.032)	(0.032)
Own consumption					
SSB consumption			-0.049		-0.045
			(0.033)		(0.031)
Own self-control			0.018		0.016
			(0.038)		(0.035)
Preference for SSBs			-0.060*		-0.058**
			(0.031)		(0.029)
Body mass index			-0.054**		-0.059**
			(0.026)		(0.025)
Presumed effects					
Reducing SSB consumption				0.132***	0.141***
				(0.045)	(0.046)
Reducing obesity				0.245***	0.237***
				(0.048)	(0.049)
Raising tax revenue				-0.032	-0.038
				(0.027)	(0.027)
Political affiliation					
Republican	-0.163**	-0.177***	-0.163**	-0.178***	-0.165***
	(0.074)	(0.066)	(0.066)	(0.061)	(0.061)
Democrat	0.195**	0.154**	0.166**	0.114*	0.127*
	(0.081)	(0.071)	(0.070)	(0.066)	(0.066)
Controls	✓	✓	✓	✓	✓
Adj. R2	0.059	0.247	0.252	0.347	0.353
Observations	1001	1001	1001	1001	1001

Notes: The table reports OLS regressions. The dependent variable is the z-standardized policy index. Political affiliations are dummy variables (reference category is "other"). All other independent variables are z-standardized. Only the control group is considered. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table C.3: Correlations with WTP for donation

	(1)	(2)	(3)	(4)	(5)
Arguments					
Externality index		0.194***	0.192***	0.154***	0.152***
		(0.038)	(0.039)	(0.039)	(0.040)
Health cost misperception index		0.079**	0.077**	0.046	0.044
		(0.037)	(0.037)	(0.037)	(0.038)
Self-control index		0.080**	0.086**	0.076*	0.082**
		(0.040)	(0.041)	(0.040)	(0.041)
Regressivity index		-0.109***	-0.106***	-0.065**	-0.062*
		(0.033)	(0.033)	(0.032)	(0.033)
Own consumption					
SSB consumption			0.021		0.025
			(0.042)		(0.042)
Own self-control			-0.034		-0.030
			(0.043)		(0.042)
Preference for SSBs			-0.016		-0.021
			(0.038)		(0.038)
Body mass index			-0.002		-0.006
			(0.035)		(0.035)
Presumed effects					
Reducing SSB consumption				0.095*	0.097*
				(0.056)	(0.056)
Reducing obesity				0.106*	0.105*
				(0.057)	(0.058)
Raising tax revenue				-0.055	-0.056
				(0.035)	(0.035)
Political affiliation					
Republican	-0.241***	-0.258***	-0.253***	-0.254***	-0.249***
	(0.085)	(0.081)	(0.081)	(0.080)	(0.080)
Democrat	0.159*	0.106	0.110	0.079	0.084
	(0.090)	(0.086)	(0.086)	(0.085)	(0.086)
Controls	✓	✓	✓	✓	✓
Adj. R2	0.032	0.110	0.107	0.136	0.133
Observations	805	805	805	805	805

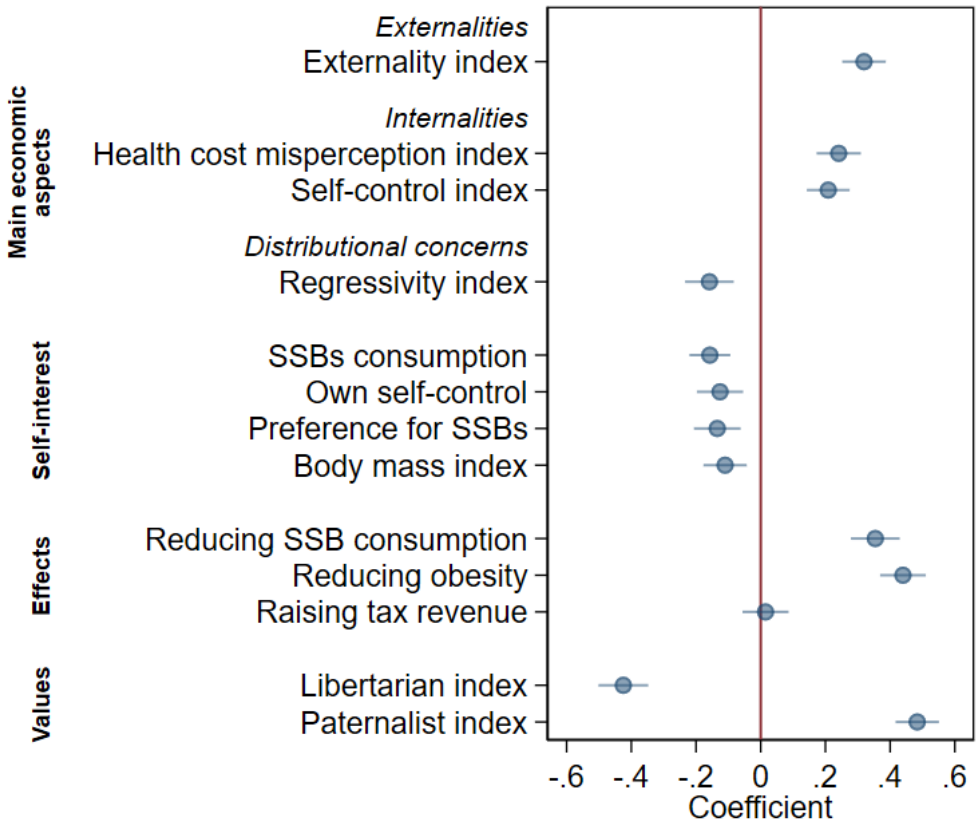
Notes: The table reports OLS regressions. The dependent variable is the z-standardized WTP for the donation to the CSPI (only respondents with consistent price lists are considered). Political affiliations are dummy variables (reference category is "other"). All other independent variables are z-standardized. Only the control group is considered. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table C.4: Interaction of values with economic aspects

	(1)	(2)	(3)	(4)
Panel A: Interaction with Paternalism index				
Externality index	0.126***			
	(0.040)			
Externality index × Paternalist index	0.702***			
	(0.162)			
Health cost misperception index		0.076		
		(0.047)		
Health cost misperception index × Paternalist index		0.591***		
		(0.166)		
Self-control index			0.060	
			(0.046)	
Self-control index × Paternalist index			0.327*	
			(0.171)	
Regressivity index				-0.085
				(0.063)
Regressivity index × Paternalist index				-0.341*
				(0.191)
Controls	✓	✓	✓	✓
Adj. R2	0.184	0.145	0.091	0.109
Observations	1002	1002	1002	1002
Panel B: Interaction with Libertarian index				
Externality index	0.725***			
	(0.108)			
Externality index × Libertarian index	-0.619***			
	(0.141)			
Health cost misperception index		0.407***		
		(0.116)		
Health cost misperception index × Libertarian index		-0.229		
		(0.162)		
Self-control index			0.381***	
			(0.129)	
Self-control index × Libertarian index			-0.351**	
			(0.175)	
Regressivity index				-0.403***
				(0.106)
Regressivity index × Libertarian index				0.340**
				(0.156)
Controls	✓	✓	✓	✓
Adj. R2	0.187	0.131	0.093	0.111
Observations	1002	1002	1002	1002

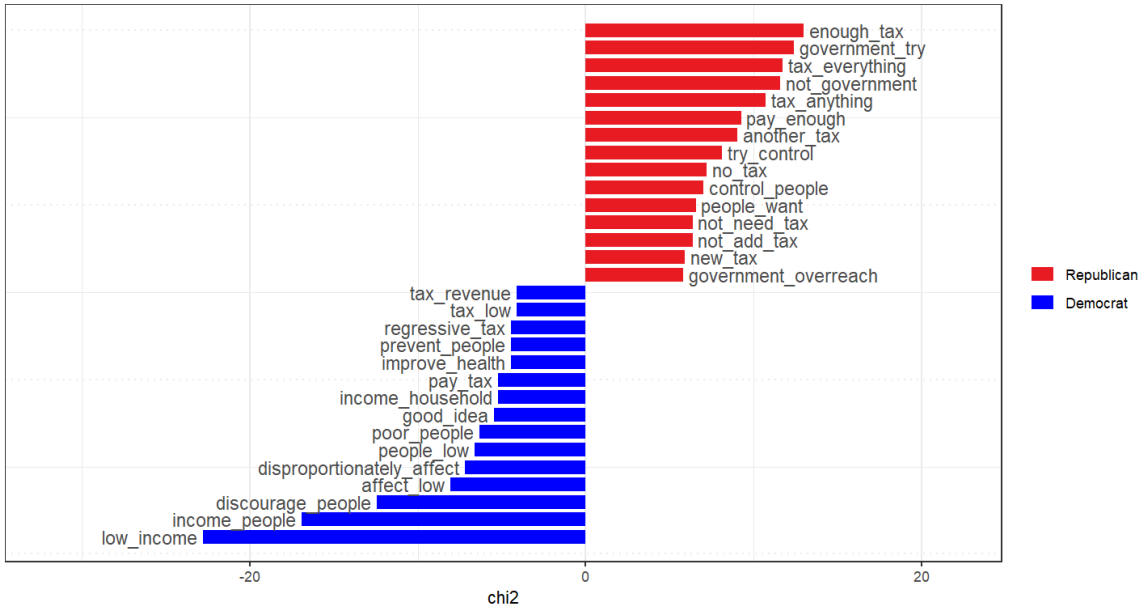
Notes: The table reports treatment effects based on OLS regressions. The dependent variable is the z-standardized policy index. The economic aspects are z-standardized indices, while the political values are scaled to be between zero and one (by subtracting the theoretical minimum and dividing by the possible range). Only the control group is considered. Significance levels are indicated by * $< .1$, ** $< .05$, *** $< .01$.

Figure C.5: Correlations with stated preference for SSB taxes in another state

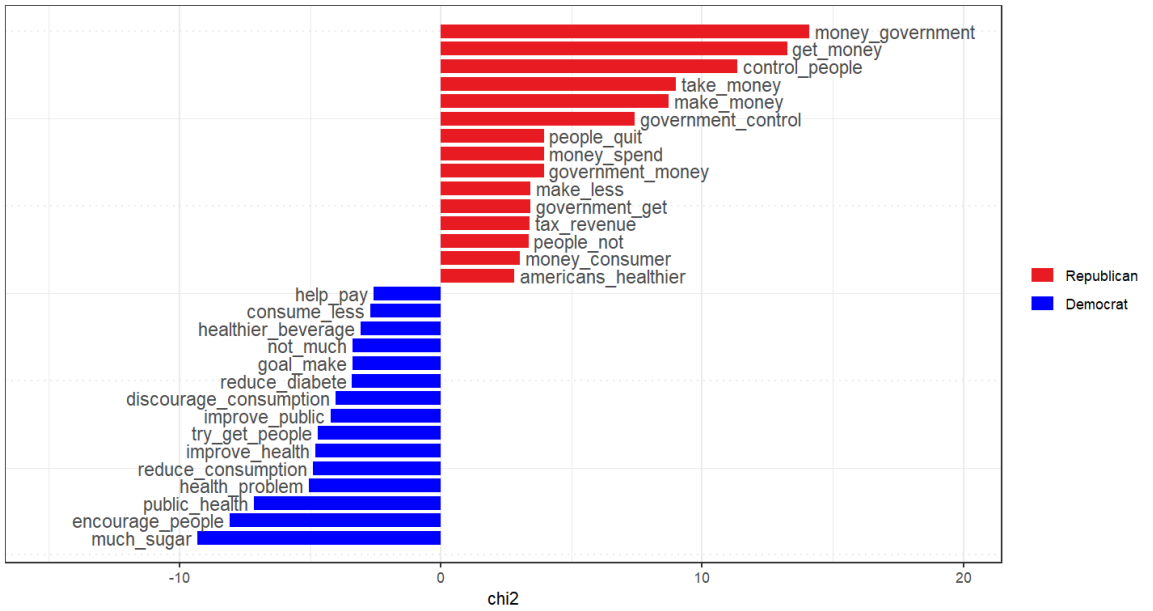


Notes: Graph shows coefficients and 95% confidence intervals from separate regressions of the preference for the tax in another state on the respective variables and control variables. All variables are z-standardized except for the party affiliation, which are dummy variables. Only the control group is used for the estimations.

Figure C.6: Keyness graphs by political affiliation



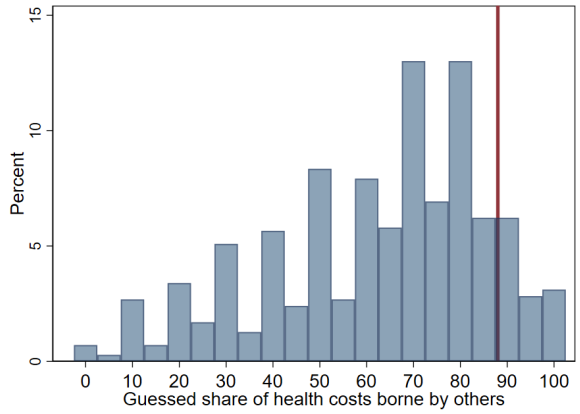
(a) Main considerations



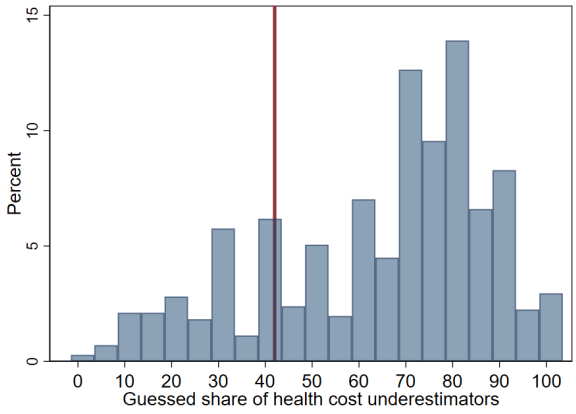
(b) Goals of an SSB tax

Notes: Graph shows word clouds and keyness graphs for perceived goals of an SSB tax. Panel (a) shows the most frequent 2-grams and Panel (b) a comparison of the relative frequency of 2-grams for Democrats and Republicans (by their chi2).

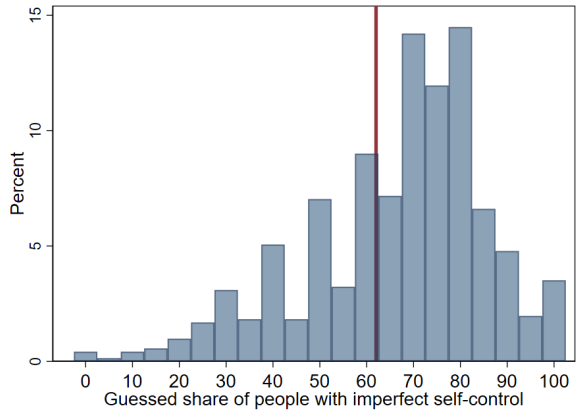
Figure C.7: Distribution of guesses in the respective treatment



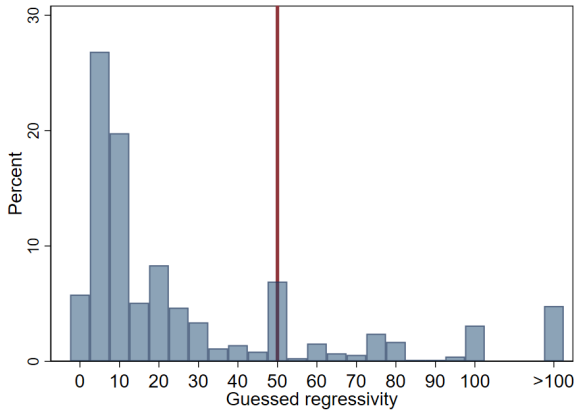
(a) Externalities



(b) Health cost misperceptions



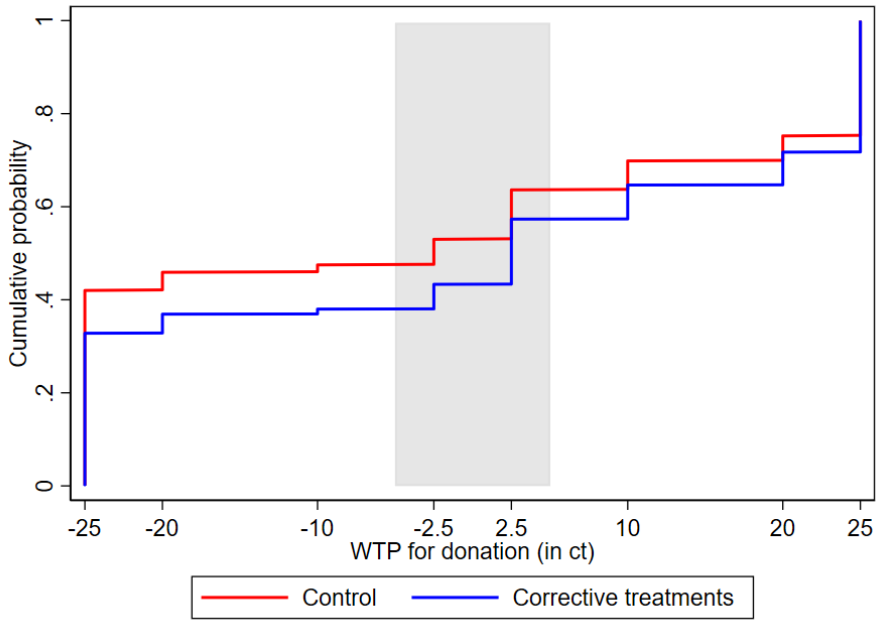
(c) Self-control



(d) Regressivity

Notes: The figure shows the distribution of incentivized guesses in the respective treatment. The red line indicates the correct value.

Figure C.8: CDF for willingness to pay for donation by treatment



Notes: Graph shows CDF of WTP for donation in the control condition and the pooled corrective treatments.

Table C.5: Treatment effects on WTP for donation

	(1) Mean WTP	(2) Positive WTP	(3) WTP of -25ct	(4) WTP of +25ct
T Externality	3.395***	0.086***	-0.103***	0.022
	(1.117)	(0.027)	(0.026)	(0.024)
T Health cost misperception	4.249***	0.118***	-0.101***	0.028
	(1.117)	(0.027)	(0.026)	(0.024)
T Self-control	2.255*	0.063**	-0.059**	0.031
	(1.159)	(0.027)	(0.026)	(0.024)
T Regressivity	3.029***	0.081***	-0.060**	0.036
	(1.157)	(0.027)	(0.026)	(0.024)
Controls	✓	✓	✓	✓
Observations	3044	3044	3044	3044

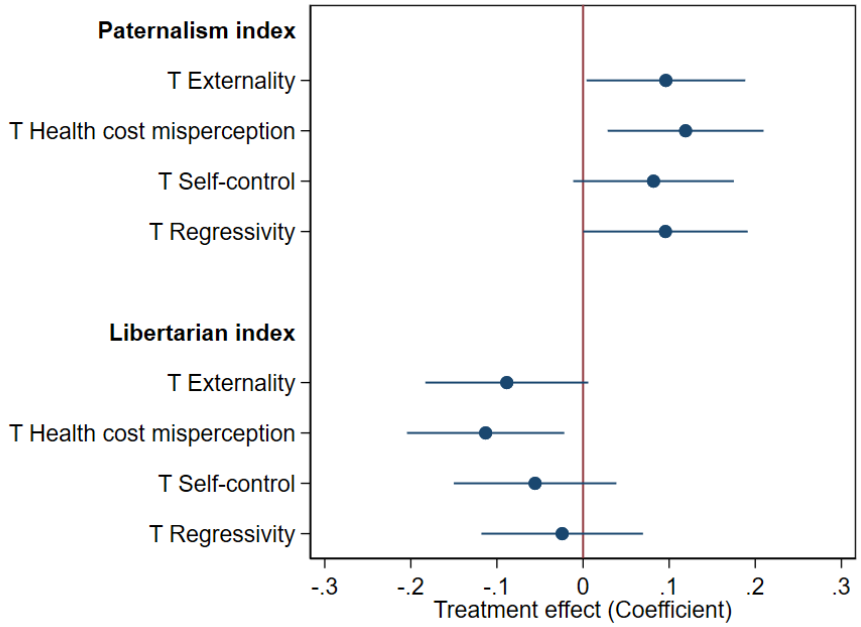
Notes: The table reports treatment effects based on OLS regressions (compared to the control). The dependent variable in Column (1) is the mean WTP for a 25ct donation to the CSPI. The dependent variables in Column (2) to (4) are indicator variables for a positive WTP, a WTP of -25ct, and a WTP of +25ct, respectively. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table C.6: Heterogeneous treatment effects by political affiliation and income

	(1) Policy index	(2) WTP for donation	(3) Policy index	(4) WTP for donation
T Externality	0.239***	0.221**	0.190**	0.304***
	(0.090)	(0.092)	(0.090)	(0.093)
T Health cost misperception	0.165*	0.291***	0.085	0.166*
	(0.091)	(0.095)	(0.089)	(0.096)
T Self-control	0.197**	0.081	0.109	0.227**
	(0.094)	(0.095)	(0.090)	(0.095)
T Regressivity	0.063	0.161	0.141	0.266***
	(0.092)	(0.098)	(0.088)	(0.097)
Republican	-0.471***	-0.461***		
	(0.079)	(0.088)		
× T Externality	-0.163	-0.011		
	(0.120)	(0.131)		
× T Health cost misperception	-0.075	-0.161		
	(0.120)	(0.131)		
× T Self-control	-0.028	0.078		
	(0.131)	(0.139)		
× T Regressivity	0.003	-0.040		
	(0.126)	(0.139)		
Below 35k			-0.111	-0.007
			(0.082)	(0.093)
× T Externality			-0.055	-0.240*
			(0.127)	(0.139)
× T Health cost misperception			0.152	0.032
			(0.132)	(0.143)
× T Self-control			0.172	-0.149
			(0.134)	(0.144)
× T Regressivity			-0.033	-0.167
			(0.129)	(0.148)
Above 75k			0.037	0.085
			(0.074)	(0.082)
× T Externality			-0.036	-0.146
			(0.119)	(0.124)
× T Health cost misperception			0.058	0.077
			(0.116)	(0.126)
× T Self-control			0.070	-0.105
			(0.120)	(0.127)
× T Regressivity			-0.086	-0.143
			(0.116)	(0.127)
Constant	0.252***	0.233***	0.014	-0.035
	(0.062)	(0.067)	(0.056)	(0.062)
Observations	2420	1927	3863	3111

Notes: Table reports heterogeneous treatment effects based on OLS regressions. Reference categories are Democrats and respondents with income between 35k and 75k US Dollars. In Columns 1 and 2, individuals with political affiliation "Independent/Other" are excluded. Robust standard errors are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Figure C.9: Treatment effect on policy values



Notes: Graph shows the treatment effects on the z-standardized value indices (with 95% confidence intervals). All regressions include controls.

Table C.7: Within-treatment guesses

	(1) Policy index	(2) WTP for Donation
Panel A: Externality		
Guess externality	0.006***	0.107***
	(0.002)	(0.035)
Controls	✓	✓
Observations	688	568
Panel B: Health costs		
Guess health costs	0.003*	0.080**
	(0.002)	(0.037)
Controls	✓	✓
Observations	694	568
Panel C: Self-control		
Guess self-control	0.002	-0.020
	(0.002)	(0.048)
Controls	✓	✓
Observations	695	552
Panel D: Regressivity		
Log Guess regressivity	0.029	-0.728
	(0.031)	(0.697)
Controls	✓	✓
Observations	687	543

Note: Table reports regression estimates of the z-standardized policy index and the WTP for the donation on the within-treatment guesses and control variables. The guessing questions are: share of obesity-related health costs borne by others (externalities), share of respondents underestimating health costs (health cost misperception), share of respondents stating a lack of self-control (self-control), and how much more poor consumers spend on SSBs than rich consumers (regressivity). Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$.

D Willingness to pay for donation

This section provides additional details on the construction of the willingness to pay measure.

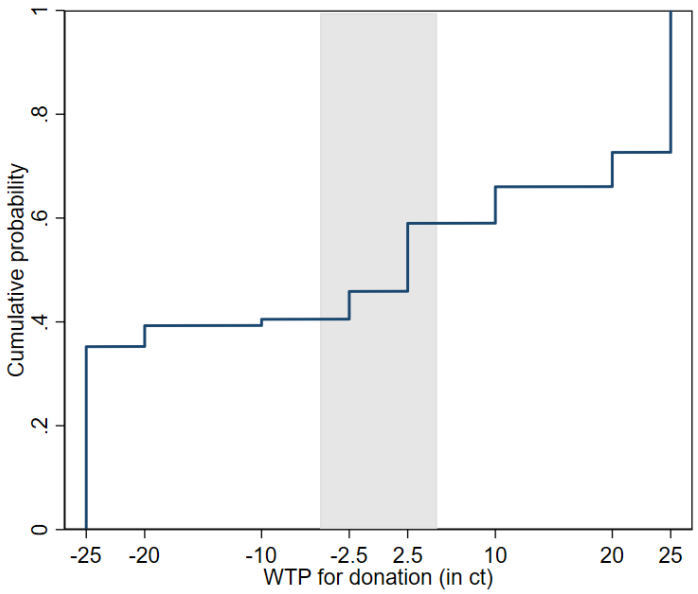
The survey requires subjects to make a decision in each row of the multiple price list shown in Figure 1. They decide on an allocation of (x_i, x_j), where x_i is a payout for herself, and x_j is a donation to the CSPI. Based on their switching point, their willingness to pay for a 25ct donation can be assigned to one of the intervals: $(-\infty, -25]$, (-25,-15], (-15,-5], (-5,0], [0,5), [5,15), [15,25), $[25, \infty)$. For simplicity, we use the midpoint of each range as the WTP and for individuals that never switch we assign the endpoint. For example, an individual that prefers the left option in the first five rows, but prefers the right option in the bottom two rows, is willing to give up between 5ct and 15ct to trigger a 25ct donation (and is assigned a WTP of 10ct). An individual who prefers the left option in the first row, but the right option in the remaining six rows, is willing to give up between 15ct and 25ct to prevent a 25ct donation (and is assigned a WTP of -20ct).

We can only compute a WTP for observations that are internally consistent, that is, they need to have at most one switching point. This excludes 15.2 percent of responses. Moreover, we do not include respondents that switch from the right option to the left option down the list (as these respondents exhibit implausible aversion to money).[43] This restriction excludes another 4.2 percent of responses. In total, we are left with 80.5 percent of observations, that are internally consistent.

Figure D.1 illustrates the resulting CDF of the WTP measure over all treatments. The figure shows that 35.2 percent of respondents are willing to give up 25ct to prevent a 25ct donation to the CSPI. In contrast, 27.4 percent of subjects are willing to give up 25ct to trigger a donation of 25ct. The remaining 37.4 percent of subjects have an intermediate WTP between -25ct and +25ct. As illustrated by the shaded area in the figure, 18.5 percent maximize their own payout, that is, they are assigned a WTP of -2.5ct or 2.5ct (note that the multiple price list does not allow to express a WTP of zero, but instead only weakly positive or weakly negative WTPs are possible).

[43] For example, in the first and second row everything is fixed except for the payout to the respondent. If a respondent prefers the right option in the first row, she should also prefer the right option in the second row, as it will pay her additional 10ct, everything else constant.

Figure D.1: CDF of donation WTP (all treatments)



Notes: Graph shows CDF of the WTP for a donation of 25ct to the CSPI. The shaded area illustrates the range corresponding to individuals who have a WTP of zero.

E Political value indices

To measure political values, we perform an exploratory factor analysis using all twelve items. The scree plot in Figure E.1 suggests that two factors ought to be extracted.

The rotated factor loadings of the two items are shown in Table E.1. The first factor loads high on items associated with general paternalistic attitudes (e.g., "Limiting a person's autonomy to promote her own good is acceptable"). It also loads high on items related to the two types of paternalism as classified by Ambuehl *et al.* (2021): mistakes-projective paternalism ("Policies should prevent others from making the same mistakes that I do") and ideals-projective paternalism ("Policies should prevent others from making the same mistakes that I do"). Moreover, there is a high factor loading for rather authoritarian views ("Sugary beverage consumption is wrong, irrespective of the consequences"). For simplicity, we form an equal-weighted "paternalism" index based on all eight items that load with at least 0.6 on factor 1.

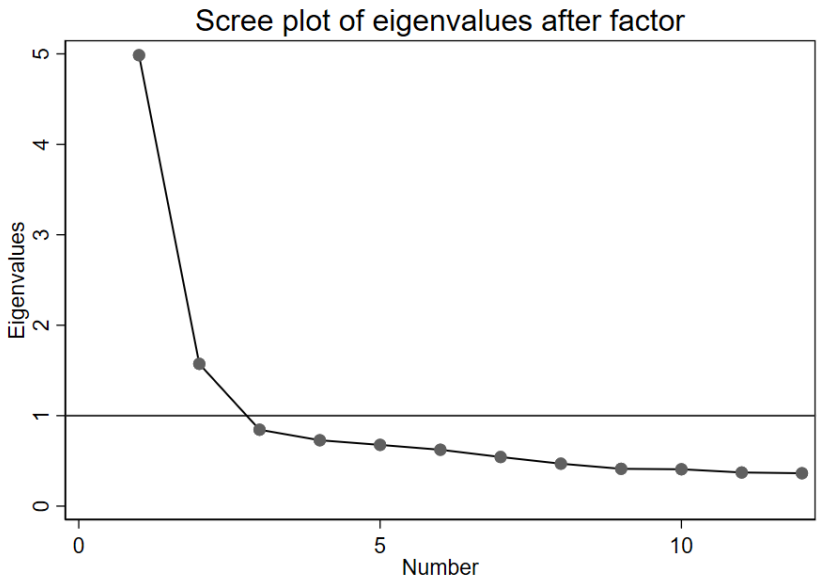
The second factor loads high on libertarian attitudes ("The government should not intervene in the economy") and critical views on state intervention in consumption decisions ("The state should not interfere with what people eat or drink"). Based on the three items that load with at least 0.6 on factor 2, we form a "libertarianism" index.

Table E.1: Rotated factor loadings of political values scale

	Factor1	Factor2
The state is allowed to interfere with personal autonomy to provide fairness and equality of opportunity.	**0.6725**	-0.3993
The government should be responsible to reduce obesity.	**0.6493**	-0.3307
The government should not intervene in the economy.	-0.0204	**0.7571**
Taxes that have the purpose to change behavior are wrong.	-0.2180	**0.7166**
The state should not interfere with what people eat or drink.	-0.3333	**0.6833**
Limiting a person's autonomy to promote her own good is acceptable.	**0.7502**	-0.2353
Intervening with a person's choices is justified if the person interfered with will be protected from harm.	**0.7066**	-0.3348
Policies should prevent others from making the same mistakes that I do.	**0.7689**	-0.1806
I can infer what is best for others from my own preferences.	**0.6105**	0.2675
Interfering with a person's autonomy is justified, as people can have wrong preferences.	**0.7615**	-0.2304
A good nutrition will improve a person's character.	0.5646	0.1744
Sugary beverage consumption is wrong, irrespective of the consequences	**0.6482**	0.0651

Notes: Table shows rotated factor loadings after principal component factor analysis (varimax rotation). Factor loadings above 0.6 are in bold. Only the control group is used (N=1,017).

Figure E.1: Screeplot for political values



Notes: Graph shows scree plot after principal component factor analysis using the twelve items of the political values scale. Only the control group is used.

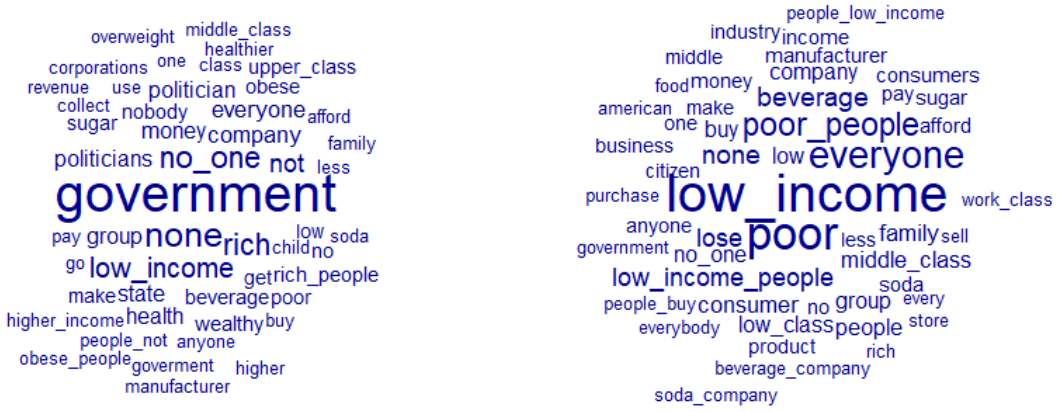
F Text analysis

Our analysis of the free text responses follows Ferrario and Stantcheva (2022). First, we lemmatize the free-text responses, that is, we replace inflected forms of words with their dictionary form (e.g., "went" is replaced by "go"). For that purpose, we use the R package udpipe. Next, we use the quanteda package by Benoit *et al.* (2018) to pre-process the text data. We remove numbers, punctuation, symbols, and separators. Moreover, we remove stopwords that have no intrinsic meaning (e.g., "I," "that," or "and") and words that repeat the question (e.g., "sugary," "drink," "implement") or do not add information (e.g., "think," "believe," "feel"). We group together collocations that frequently occur together, but are not understandable as a 2-gram (e.g., "get people").

For the analysis of main considerations and goals of an SSB tax in Figures 2 and C.6, we generate 2-grams as sets of two subsequent words each. We group together 2-grams that share the same elements but are in a different order (e.g., "tax enough" and "enough tax") and we remove 2-grams that are not informative (e.g., "tax tax," "not sure," or "sugar tax"). Since some 2-grams contain a collocation they can also consist of three words.

For the analysis of winners and losers of an SSB tax in Figure F.1, we plot 1-grams since many respondents give 1-word responses. Here too, we group together the most frequent collocations (e.g., "no one", "low income", "poor people"), which means that some 1-grams consist of two words.

Figure F.1: Word clouds for winners and losers of an SSB tax

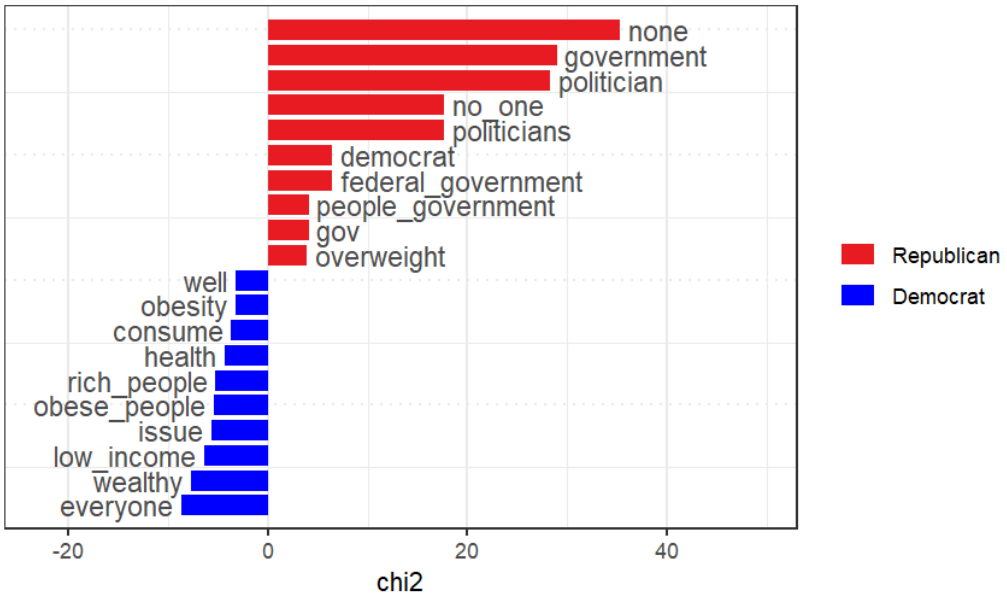


(a) Winners

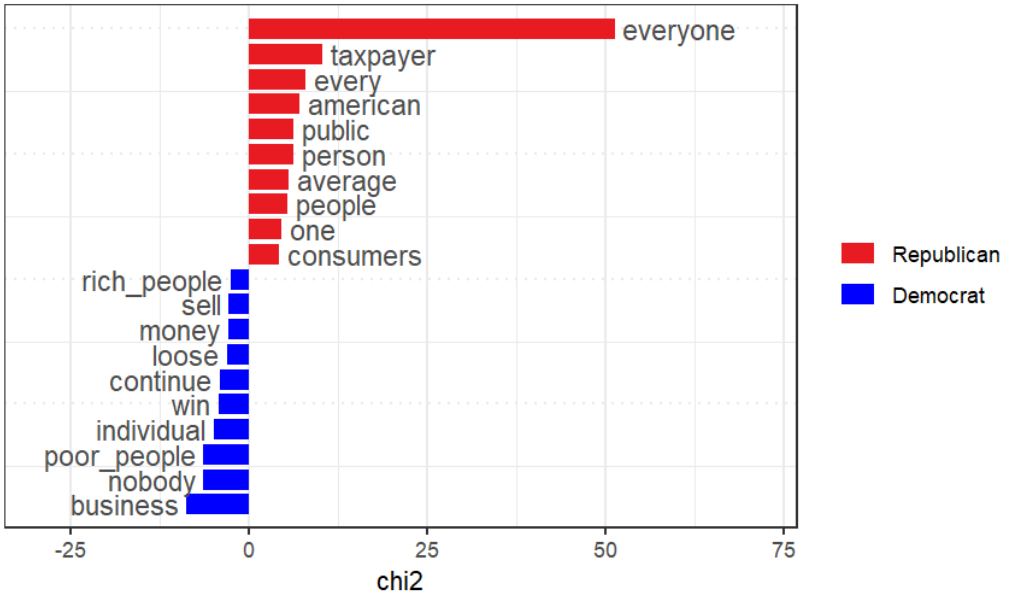
(b) Losers

Notes: Graph shows word clouds for potential winners and losers of an SSB tax. The graph shows the most frequent 2-grams mentioned by the political groups.

Figure F.2: Keyness analyses for winners and losers of an SSB tax



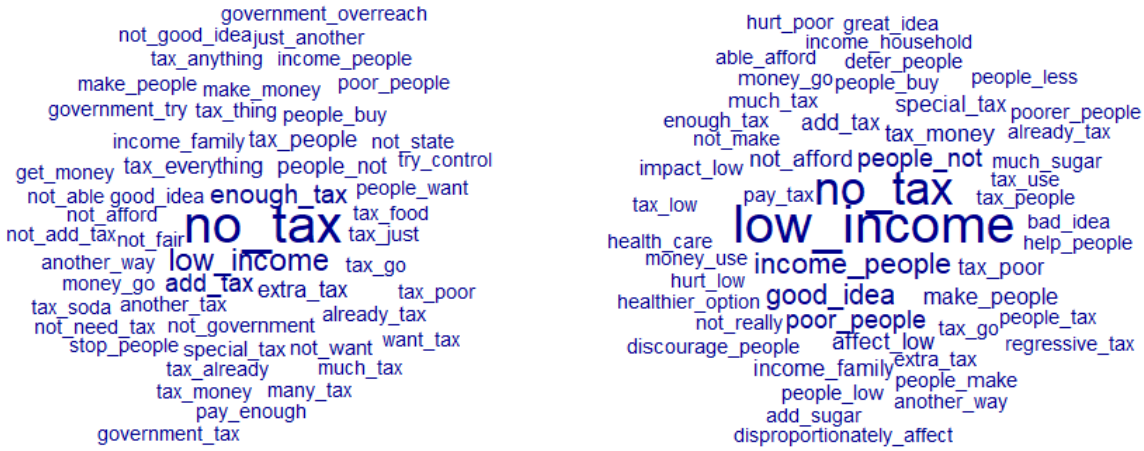
(a) Winners



(b) Losers

Notes: Graph shows word keyness graphs for potential winners and losers of an SSB tax by political affiliation. The graph shows a comparison of the relative frequency of 1-grams and 2-grams by Democrats and Republicans (by their chi2).

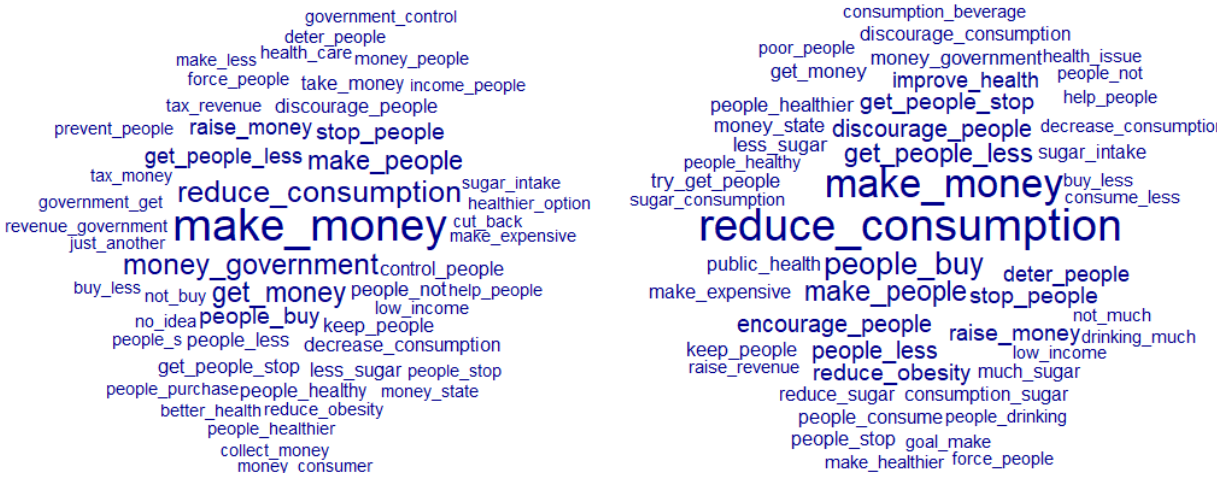
Figure F.3: Word clouds for considerations about SSB tax (by political affiliation)



(a) Republicans (b) Democrats

Notes: Graph shows word clouds for main considerations regarding an SSB tax and its possible introduction by political affiliation. The graph shows the most frequent 2-grams mentioned by the political groups.

Figure F.4: Word clouds for goals of SSB tax (by political affiliation)



(a) Republicans (b) Democrats

Notes: Graph shows word clouds for goals of an SSB tax by political affiliation. The graph shows the most frequent 2-grams mentioned by the political groups.

G Instructions

G.1 Pre-Screening

Welcome to the survey

Please answer the following questions about yourself.

- What is your gender? [Male; Female; Other]
- What is your age?
- What was your TOTAL household income, before taxes, in 2020? [Less than $5,000; $5,000-$14,999; $15,000 - $24,999; $25,000 - $34,999; $35,000 - $44,999; $45,000 - $54,999; $55,000 - $64,999; $65,000 - $74,999; $75,000 - $84,999; $85,000 - $99,999; $100,000 - $149,999; $150,000 or more]

G.2 Consent form

Welcome to the survey

You are invited to take part in a research study about nutritional habits and health policy. The study is administered by Dr. Renke Schmacker (University of Lausanne, Switzerland) and Dr. Tobias König (Linnaeus University, Sweden).

The study consists of a survey that takes around 10 to 15 minutes to complete. We are interested in how attitudes differ for different people. Your honest responses will be appreciated.

All data will be treated confidentially and may not be disclosed, unless required by law and regulation. During this study, no personally identifiable information will be collected, except for data necessary for the administrative/financial management of the study. Participation in this study is anonymous. Results will be published only in aggregated form and will not identify individual participants. Please note that participation in this study is entirely voluntary and that you may discontinue participation at any time. If you do not complete the questionnaire, you will not be compensated.

Contact information For any questions, comments, or to exercise your right to access or erase your personal data, please contact Dr. Renke Schmacker at renke.schmacker@unil.ch.

Please indicate if you have read and understood the information in this form and if you consent to participate in the study. [Yes, I consent to participate in this study.; No, I do not consent to participate in this study.]

G.3 Demographic questions

- In which state do you currently reside? *[list of federal states]*
- How many children do you have? [I do not have children; 1; 2; 3; 4; 5 or more]
- About how tall are you? Feet: _____, Inches: _____
- About how much do you weigh (in pounds)?
- Are you Hispanic, Latino, or Spanish origin? [Yes; No; Prefer not to answer]
- What is your race? [White; Black or African American; American Indian or Alaska Native; Asian; Other (please specify: _____)]
- Which category best describes your level of education? [Primary education or less; Some High School; High School degree/GED; Some College; 2-year College Degree; 4-year College Degree; Master's Degree; Doctoral Degree; Professional Degree (JD, MD, MBA)]
- What is your current employment status? [Full-time employee; Part-time employee; Self-employed or small business owner; Unemployed and looking for work; Student; Not currently working and not looking for work; Retiree]
- What do you consider to be your political affiliation, as of today? [Republican; Democrat; Independent; Other; Non-Affiliated]

G.4 Consumption and preferences

- During the past month, how often did you drink sugary drinks? Sugary drinks (also known as sugar-sweetened beverages) refer to any beverage with added sugar or other sweetener (e.g., corn syrup).

  This includes soda, pop, cola, tonic, lemonade, sweetened coffee drinks, iced tea, as well as sports drinks and energy drinks. Do not include diet (sugar free) soft drinks and fruit juices, such as orange, apple, and other juices. Mark one.

[Never; 1 time last month; 2-3 times last month; 1 time per week; 2 times per week; 3-4 times per week; 5-6 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6 or more times per day]

- Leaving aside any health or nutrition considerations, how much would you say you like the taste and generally enjoy drinking the following?
  - Sugary drinks (cola, soda, pop, etc.): [Dislike a great deal; Dislike somewhat; Neither like nor dislike; Like somewhat; Like a great deal]
  - Diet soft drinks: [Dislike a great deal; Dislike somewhat; Neither like nor dislike; Like somewhat; Like a great deal]
- How much do you agree to the following statement?

  I drink soda pop or other sugar-sweetened beverages more often than I should

  [Not at all; Somewhat; Mostly; Definitely]
- In general, how important is it to you to stay healthy, for example by maintaining a healthy weight, avoiding diabetes and heart disease, etc.?

  [Not at all important; Slightly important; Moderately important; Very important; Extremely important]

G.5 Attention check

If subjects fail the attention check question below, they are automatically screened out and redirected to the survey company via a dedicated link.

In order to facilitate our research on decision making we are interested in knowing certain factors about you, the decision maker. Specifically, we are interested in whether you actually take the time to read the directions; if not, then we will not be able to answer our research questions. So, in order to demonstrate that you have read the instructions, please ignore the question below. Instead, simply enter the number 25. Thank you very much. Out of 100 adults in the U.S., how many individuals read newspapers? _____

G.6 Beliefs about SSB consumption of others

What would you say regarding how often individuals in the following income groups drink sugar-sweetened beverages?

- During the past month, how often do you think American consumers with annual household incomes below $10,000 drank sugary beverages on average?

  [Never; 1 time last month; 2-3 times last month; 1 time per week; 2 times per week; 3-4 times per week; 5-6 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6 or more times per day]

- During the past month, how often do you think American consumers with annual household incomes over $100,000 drank sugary beverages on average?

  [Never; 1 time last month; 2-3 times last month; 1 time per week; 2 times per week; 3-4 times per week; 5-6 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6 or more times per day]

G.7 Free-text questions

Now, we would like to ask you a few broader questions. Please use the text boxes below and write as much as you feel. Your opinion and thoughts are important to us! There is no right or wrong answer.

- When you think about a sugary drink tax (a special tax or surcharge on drinks with added sugar), and whether the state should implement such a tax, what are the main considerations that come to your mind? [Free-text box]

- What do you think are the goals of a tax on sugar-sweetened beverages? [Free-text box]

- Which groups of people do you think would benefit if taxes on sugary beverages were introduced in the US? [Free-text box]

- Which groups of people do you think would lose if taxes on sugary beverages were introduced in the US? [Free-text box]

G.8 Information treatments

[Instructions for the information treatments are provided in Appendix B]

G.9 Agreement with arguments

To what extent do you agree or disagree with the following statements?

- Individuals have little knowledge about the weight implications of high sugar consumption.
- Individuals are unaware of the health consequences of sugary drinks for their later life.
- Individuals have difficulties resisting the temptation of sugary drinks.
- Individuals consume more sugar than they actually would like to.
- Consumption of sugary beverages imposes costs for others in the public health system.
- Consumption of sugary beverages imposes costs on the society.
- Taxes on sugary beverages hit the poor the hardest.
- The burden of sugary taxes falls more heavily on the poor than on the rich.

  [Fully disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Fully agree]

G.10 Preferences for SSB taxes

- In the US, eight local jurisdictions have implemented special taxes on sugary beverages.

  We would like to know what you think about introducing a federal tax on sugary beverages in the entire United States.

  Do you favor or oppose introducing a federal tax on sugary beverages in the United States?

  [Strongly oppose; Oppose; Neither favor nor oppose; Favor; Strongly favor]

- If the US was to introduce a federal tax on sugary beverages: How large would you like the tax to be (in US cents per liter)?

  For your orientation, the average price of a sugary beverage in the US is about 114 cents per liter.

The tax on sugary beverages should be: [Slider 0-120]

- Now you can decide on a donation to an organization that promotes the introduction of a sugary drinks tax on the federal level. The donation will be made to the "Center for Science in the Public Interest" (CSPI). The CSPI is an independent consumer advocacy organization with the goal to support nutrition, food safety, and health in the US. The CSPI's funding comes from individual donors and foundations. The CSPI currently supports, among others, the introduction of a federal tax on sugary drinks.

  Your task: Below you will see seven different choice situations. For each of the seven choice situations, you must choose whether you prefer the left or the right payout option, by clicking the corresponding button. The left payout options include a donation to the CSPI and a payment for you (in US cents). The right payout options only include a payment for you. We will use a lottery to draw one of the seven choice situations, and we will implement the choice that you have made for that situation. Any donation to the CSPI will be transferred by us after the study is concluded. Any payment for you will be sent to you in panel currency.

  Which would you prefer: the left or the right payout option? (Note that the left options include a donation to the CSPI, while the right options do not include a donation.)

  [25ct for CSPI, 25ct for you] or [0ct for CSPI, 0ct for you]

  [25ct for CSPI, 25ct for you] or [0ct for CSPI, 10ct for you]

  [25ct for CSPI, 25ct for you] or [0ct for CSPI, 20ct for you]

  [25ct for CSPI, 25ct for you] or [0ct for CSPI, 25ct for you]

  [25ct for CSPI, 20ct for you] or [0ct for CSPI, 25ct for you]

  [25ct for CSPI, 10ct for you] or [0ct for CSPI, 25ct for you]

  [25ct for CSPI, 0ct for you] or [0ct for CSPI, 25ct for you]

- *[If state of residence is not California:]* In California, four cities have introduced a dedicated tax on sugar-sweetened beverages.

  Would you favor or oppose introducing taxes on sugar-sweetened beverages on the state level in California?

- *[If state of residence is California:]* In Pennsylvania, one city has introduced a dedicated tax on sugar-sweetened beverages.

  Would you favor or oppose introducing taxes on sugar-sweetened beverages on the state level in Pennsylvania?

  [Strongly oppose; Oppose; Neither favor nor oppose; Favor; Strongly favor]

G.11 General policy attitudes

- If the US were to introduce a tax on sugary drinks, to what extent would it entail the following behaviors and outcomes?

  - Reducing sugary beverage consumption
  - Reducing the prevalence of overweight and obesity
  - Raising tax revenue
  - Hurting the US economy

    [None at all; A little; A moderate amount; A lot; A great deal]

- Finally, please indicate whether you agree with the following statements.

  - The state is allowed to interfere with personal autonomy to provide fairness and equality of opportunity.
  - The government should be responsible for reducing obesity.
  - The government should not intervene in the economy.
  - Taxes that have the purpose to change behavior are wrong.
  - The state should not interfere with what people eat or drink.
  - Limiting a person's autonomy to promote her own good is acceptable.
  - Intervening with a person's choices is justified if the person interfered with will be protected from harm.
  - Policies should prevent others from making the same mistakes that I do.
  - I can infer what is best for others from my own preferences.
  - Interfering with a person's autonomy is justified, as people can have wrong preferences.

– A good nutrition will improve a person's character.

– Sugary beverage consumption is wrong, irrespective of the consequences

[Fully disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Fully agree]

G.12 Feedback for information treatments

The correct solution to the guessing question:

- *[Externality treatment:]* The study by Cawley and Meyerhoefer (2012, Journal of Health Economics) estimates that out of 100 Dollars of obesity-related health costs 88 Dollars are borne by others and not by the individuals themselves.
- *[Health costs treatment:]* The metabolic simulation model by Hall et al. (2011, The Lancet) estimates that the person in question would gain 12 lbs in weight after drinking one additional can (330ml) of Coca-Cola per day for three years. In our survey, 41 percent of respondents underestimated the correct answer by at least 10 percent.
- *[Self-control treatment:]* In our survey, 62 percent of individuals answered that they at least somewhat agree with the statement "I drink soda pop or other sugar-sweetened beverages more often than I should." A comparable finding is reported in Allcott, Lockwood and Taubinsky (2019, Quarterly Journal of Economics).
- *[Regressivity treatment:]* The study by Allcott, Lockwood, and Taubinsky (2019, Quarterly Journal of Economics) estimates that the share of income that an average consumer with an income below $10,000 spends on soft drinks is 50 times higher than what a consumer with an income between $100,000 and $150,000 spends.

Do you have any comments or suggestions regarding the survey? [Free-text box]