Preferences over Sin Taxes *

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Abstract

Sin taxes have recently become a widely suggested policy instrument to discourage the consumption of goods deemed harmful to society and individuals. Using a survey experiment with a representative sample of the US population, we provide evidence on individuals' preferences over sin taxes and how they reason about such corrective policies. We reveal that preferences over taxes on sugary beverages are more driven by normative considerations than self-interested pocketbook concerns. People place large weight on efficiency reasoning, in particular on Pigouvian ideas. But also anti-paternalism and regressivity concerns are prevalent, which help to explain the relatively low support for sugary beverage taxes that we observe in the data. However, preferences over sugary beverage taxes are malleable and can be causally shifted by information interventions: Explaining individuals the ideas of corrective taxation yields significant increases in the support for sugary beverage taxes and the general openness to corrective policies.

JEL-codes: H20, D12, I18

Keywords: sin tax, internality, externality, soda tax, self-control

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1 Introduction

"Sin taxes" have recently become a widely suggested policy instrument to discourage the consumption of goods deemed harmful to society and individuals. Many countries have adopted or are currently discussing special price surcharges on soft drinks, fast foods, candies, sugar, marijuana, alcohol and tobacco. The normative rationale for using taxes on sin goods typically comprises externality and internality arguments, which have become key ingredients in (behavioral) welfare economics models (Allcott *et al.*, 2019a). The idea is that consumption of sugar, alcohol, or tobacco imposes future harm to individuals, which is not fully accounted for by the consumer, either as they are not fully aware of the health risks of their behavior or because they lack self-control. The consumption of sin goods can also generate external effects in the form of higher costs for the public health system. Consequently, sin taxes that reduce the consumption of such goods can be welfare-improving. However, sin taxes impose a relatively high tax burden on the poor, as they spend a larger share of their income on sin goods. While the theoretical rationales and properties of sin taxes are meanwhile well understood, there is no systematic empirical evidence on individuals' policy preferences over these sin taxes.

In this paper, we provide evidence on how people feel and think about sin taxes. We ask which factors and considerations matter for their empirical support or opposition to sin taxes, and whether providing information about the theoretical mechanisms and rationales over sin taxes can affect policy demand.

We use an example that has received wide attention among policy makers and economists, the example of taxes on sugar-sweetened beverages (SSBs). Sin taxes on sugary drinks are an often proposed policy instrument to tackle high sugar intake, which is considered one of the main culprits of the "global obesity epidemic" (WHO, 2000). We study preferences over sugary beverage taxes in a country where soft drink consumption and overweight is particularly prevalent, namely the US.[1] To date, seven US cities have introduced taxes on SSB, but there is no such tax at the federal or state level so far.

Drawing on a representative sample of more than 3,800 American citizens, we elicit respondents' preferences over the introduction of SSB taxes on the federal level, as well as for some selected US states. We use both unincentized and incentivized preference relevation techniques. The latter consists of multiple price lists (MPLs) that elicit the

[1]The US has the second highest per capita consumption of carbonated soft drinks in the world with more than 150 liters per year, and more than 70 percent of the population is overweight or obese.

willigness-to-pay to donate for a NGO lobbying for US wide taxes on soft drinks. We designed the MPL to allow for negative as well as positive WTPs. This allows us to separate indifferent consumers from those who have a strict aversion against sugary taxes.

A major purpose of our study is to decompose the preferences over sugary taxes into primary factors often used in economic theory, such as externalities and internalities, and to provide evidence which of these factors matter for individuals' policy views. For that purpose, we follow an approach recently suggested by Stantcheva (2020, 2021), combining free-text and descriptive analysis with experimental interventions.

In the first part, we ask respondents in free-text form about their opinion regarding the introduction of a special tax on sugary beverages in the US. These questions are meant to elicit individuals' first-order reasoning about sugary taxes before primed by the survey. We then explicitly elicit respondents' approval to certain primitives and economic underlyings, which would, from a theoretical perspective, speak in favor or against sugary beverage taxes. For instance, we ask respondents whether they agree with the statement that the consumption of sugary beverages imposes costs for others in the society (externalities), whether they think that individuals have difficulties resisting the temptation of sugary drinks (self-control) or whether they think that they are unaware of the adverse health consequences (misperceptions), and whether the burden of sugary taxes falls more heavily on the poor than on the rich (regressivity). We analyze the explanatory power of these agreeing with these statements for individuals' views on sugary taxes, as obtained from incentivized and unincentized questions at the end of the survey. This allows us to map individuals' reasoning about sin taxes and to break down their preferences into different categories, such as self-interested and ethical.

In the second part of the analysis, we study whether simple explanations of the economic rationales can causally change policy preferences. The information treatments explain the arguments intuitively in only a few lines, and we provide comic visualizations to increase the understanding. We implement in total four information treatments, one for each of the economic rationales: externalities, health cost misperceptions, self-control, and regressivity. For each rationale, we elicit beliefs about the severity of the underlying problem in an incentivized way.

Our main findings are as follows. Pocketbook concerns such as the preference for soft drinks and own SSB consumption levels play a minor role in people's reasoning over sugary taxes. Policy views seem to be more driven by general normative considerations, including ideas of efficiency-related corrective taxation (paternalism and Pigou taxation)

and equity concerns (regressivity). Although the support of sugary taxes is rather low compared to optimal taxation theory, the political views are surprisingly well predicted by the ingredients of optimal sin tax theory. Among the efficiency arguments, people place particularly high weight on Pigouvian ideas. Among the internality arguments, motives to correct health cost misperceptions shape policy views more than motives to correct a lack of self-control. But our results reveal that also non-efficiency related factors are important for peoples' normative reasoning about sin taxes, namely anti-paternalist and anti-interventionist views. These views are to a larger degree, but not exclusively, observed among Republicans, and they go along with strong aversions against SSB taxes. Moreover, especially Democrats have concerns about the regressivity of sin taxes. Together, this explains the relatively low support for sugary taxes that we observe in the data.

But, as our experimental interventions reveal, the preferences over sugary tax are malleable and can be causally shifted by information intervention. Explaining individuals the ideas of corrective taxation yields a sizeable increase in the support for sugary taxes. For example, explaining individuals the idea that sugary drinks generate externalities increases the share of individuals favoring a sugary drinks tax by 5 percentage points. Moreover, the interventions also shift the general openness to corrective policies.

This paper contributes to a nascent literature that studies how individuals reason about taxes and economics in general, and how their reasoning shapes their political preferences. Stantcheva (2021) uses survey experiments to study how people think about income and estate taxes. She finds that fairness concerns are strong predictors for preferences over taxes, although there are marked partisan differences in what is considered fair. In contrast, people are less occupied with the efficiency effects of taxes. In line with that, simple video explanations of the redistributive effects of taxes causally increase support for progressive taxes, whereas explaining the efficiency costs has no effect. Stantcheva (2020) extends the analysis to reasoning about health insurance. She finds that views on universal health insurance are very polarized and explaining its efficiency and redistribution effects does not shift the support for it. Our paper complements these findings by studying a policy that has received considerable attention in the economic literature: sin taxes. We show that individuals use the economic arguments for and against these taxes (externalities, internalities, and distributional effects), and that explaining them can shift support for the policy.

Our paper adds an empirical perspective to the theoretical literature that studies optimal corrective taxes. Ever since Pigou (1920), economists noted that consumption of

certain goods can impose externalities on other individuals and that taxing them can improve welfare (e.g., Baumol, 1972; Diamond, 1973). With the emergence of behavioral economics, the concept has been extended to internalities, that is, uninternalized costs that consumption of the present self imposes on the well-being of the future self (O'Donoghue and Rabin, 2003, 2006; Allcott *et al.*, 2019a). Such internalities can be generated, for example, by a lack of self-control or imperfect information about the costs of consumption. However, if the social welfare function puts larger weight on the poor, optimal taxes are adjusted downwards. In a calibrated model that takes all of these factors into account, Allcott *et al.* (2019a) estimate that the optimal excise tax on sugary beverages is 34ct per liter. This stands in stark contrast to the far majority of jurisdictions that have either no or much lower corrective taxes on sugary beverages. Hence, this papers studies whether the electorate has the economic arguments in mind when forming their preferences over sin taxes—and whether explaining these arguments affects support for corrective taxes.

Finally, we contribute to the literature on behavioral public economics and the long-standing debate on whether policies should aim to alleviate behavioral biases (Bernheim and Taubinsky, 2018). On the one hand, standard economic theory builds on the premise that revealed preferences have to be respected and that individuals know best what maximizes their utility. On the other hand, there is ample evidence of behavioral biases that could be addressed by paternalistic policies. Ambuehl *et al.* (2021) study preferences over paternalism and find that approximately a third of subjects are paternalists and restrict the choice set of others. Regarding their motivation, they find that paternalists believe others would be better off by following the paternalists' ideals. We find evidence for both lines of reasoning in our sample: Individuals who principally oppose intervention in individual choices are strictly against sin taxes, while individuals who are open to paternalistic policies tend to be more in favor.

2 Conceptual framework

To fix ideas and to guide our empirical analyses, we provide a simple model of corrective sin taxes.

2.1 Homogenous types

Consider an economy with a finite number of consumers, whose population size is normalized to one. 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 normalized to one. The sin good is levied with a per unit consumption tax t. Therefore, the consumer's budget constraint is given by $z_i + (1+t)x_i = y_i + T$.

The consumption of the sin good provides private benefits of $h \cdot ln(x_i)$, but also imposes internal costs on the individual, amounting to $c \cdot x_i$. The decision decision utility is given by

$$\tilde{U}_i := \tilde{u_i}(x_i, z_i; \beta, h) = h \cdot ln(x_i) + z_i - \beta c x_i, \tag{1}$$

where $\beta \leq 1$ is a parameter, representing how much weight the consumer places on the actual costs of the sin good in relation to its benefits when deciding over its level of consumption. Experienced utility is

$$U_i := \tilde{u_i}(x_i, z_i; 1, h) = h \cdot ln(x_i) + z_i - c x_i.$$

The difference between $\tilde{U}_i$ and U_i can result from different different psychological biases that individuals may have when deciding over goods like sugary drinks, alcohol, or cigarettes. For instance, people may not be perfectly informed about certain facets of these goods, such as their calorie content, or they pay only limited attention to them, and therefore underestimate their "true" (marginal) health costs c by $(1-\beta)$. Moreover, people may have self-control problems or are prone to temptation (O'Donoghue and Rabin, 2006; Gruber and Köszegi, 2001). In the present, they underweigh the future health costs of these products compared to their long-run plans. Thus, the parameter β can alternatively be interpreted as capturing a bias for the present.

The policy maker can decide over the level of the sin tax. She bases this decision on her normative views about what factors should count for social welfare. First, she has preferences over whether social welfare should be based on decision or experienced utility, or a (convex) combination of the two. Let $\xi \in [0, 1]$ be the weight she places on experienced utility. The "normative" utility the policy maker assigns to consumer i is given by

$$V_i := (1 - \xi)\tilde{U}_i + \xi U_i. \tag{2}$$

Second, in addition to internalities, there are also negative externalities of sin consumption, which depend on the total consumption of the sin good in the economy: $e\sum_i x_i$. The idea is that the consumption of goods like sugary drinks imposes costs on the health system, which are borne by the society. Denoting by $\gamma_e \in [0,1]$ the importance the policy maker ascribes to the external costs of sin consumption, social welfare (from her point of view) is given by

$$W := \sum_i V_i - \gamma_e e \sum_i x_i = \tilde{U}_i - \xi c x_i (1-\beta) - \gamma_e e x_i, \tag{3}$$

where the second equality follows as individuals are identical and the population size is normalized to one.[2] Her policy problem can thus be written as maximizing (3) with respect to t and T, subject to the public budget constraint $T = tx_i$ and to individual optimization, $x_i = h/(1+t+\beta c)$.[3] The solution to this problem gives the policy makers' most preferred tax as a function of the economy's parameters and her normative weights

$$t = \xi c(1-\beta) + \gamma_e e. \tag{4}$$

Intuitively, a paternalist policy maker ($\xi > 0$) wants to correct the decision bias of the consumers. Therefore, she seeks to increase the price of the sin good by the neglected part of the internality costs, $(1-\beta)$, weighted by ξ, the extent to which she thinks internalities should be corrected. In contrast, a non-paternalist policy maker respects consumer choices ($\xi = 0$). Her tax rate is exclusively based on the marginal external cost e, multiplied by γ_e, the degree to which she thinks externalities are to be offset. Finally, an anti-interventionist, that is, a policy maker who puts neither weight on internalities or externalities ($\xi = \gamma_e = 0$), prefers a sin tax of zero—even if she believed that externalities and internalities exist ($\beta < 1, e > 0$).

[2] An alternative way to interpret $e\sum_i x_i$ in (3) is as representing an "atmosperic" externality (i.e., an externality that depends on the total consumption, that affects individual well-being, and that individuals take as as given when performing their consumption choices.) $\tilde{U}_i$ and U_i would then be utilities excluding the loss from the negative externality, and the parameter γ_e the extent to which the policy maker wants to count the externality for individual, normative well-being.

[3] A consumer maximizes her decision utility (1) with respect to x_i and z_i, subject to individual budget constraint, taking the sin tax t and transfer T as exogenously given. The solution to this problem gives the demand function mentioned in the text, which is independent of T due to quasi-linearity.

2.2 Heterogeneity

The simple formula for the optimal tax rate will be the main guide for our statistical analyses of empirical preferences over sin taxes. 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, we build on Allcott *et al.* (2019a) and allow for heterogeneity in income, allowing tastes 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 paternalist versus non-paternalist, or welfarist versus pure pocketbook driven motives.[4]

2.2.1 Welfare interested policy makers

Assume that there are two types of individuals $i = p, r$. We refer to these individuals as the poor and the rich: $y_r > y_p$. The number of both types is normalized to one. Taste and decision biases may differ across income, so the parameters h_i and β_i are now indexed. Revenues from sin taxes continue to be distributed back to the individuals in the form of lump-sum transfers.

The social planners' policy problem can be stated as

$$\begin{aligned} \max_{t,T} \quad & W := \alpha G_p(V_p) + (1-\alpha) G_r(V_r) - \gamma_e e \sum_i x_i \\ \text{s.t.} \quad & T = t \sum_{i=1} (x_i)/2 \quad \text{and individual optimization} \\ & x_i = h \cdot [(1 + t + \beta c)]^{-1}, \end{aligned} \tag{5}$$

where G_i are monotonically increasing non-linear functions of V_i. The parameter α is the Pareto weight the policy planner assigns to the (monotonic transformation of) the normative utility of the poor. For latter use, we define

$$g_p = \frac{\alpha V_p'}{\lambda}, \quad g_r = \frac{(1-\alpha) V_r'}{\lambda}, \tag{6}$$

[4] In the case of homogeneous types, selfish pocketbook motives cannot be meaningfully disentangled from efficiency concerns: excluding externality effects, the social welfare maximizing tax is the same than the egoistically demanded sin tax, as $\sum V_i$ is a monotone transformation of individual well-being V_i if individuals are homogeneous.

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. The marginal welfare weights g_p and g_r are endogenous. They measure the social value (from the policy maker's perspective) of a marginal unit of consumption for a consumer, measured in terms of public funds.

The optimal sin tax is characterized by the following condition:

$$t = \frac{1}{\lambda}\gamma_e e + \xi \frac{g_p c(1-\beta_p)\frac{\partial x_p}{\partial t} + g_r c(1-\beta_r)\frac{\partial x_r}{\partial t}}{\frac{\partial x_p}{\partial t} + \frac{\partial x_r}{\partial t}} + \frac{(x_p - x_r)(g_p - 1)}{\frac{\partial x_p}{\partial t} + \frac{\partial x_r}{\partial t}}. \tag{7}$$

While (7) is not a reduced-form equation for the tax, it is still valuable to understand the forces driving the sin taxes in a model with heterogeneous types.[5] The first two terms in (7) represent the externality and internality correction motive of the social planner, respectively. The major difference to (4) is that now the internality terms are weighted by the marginal social welfare weights (and how elastic a consumer's sin consumption is). To give an intuition, if the social planner has paternalist motives ($\xi > 0$), she wants to make the consumer to internalize the marginal health costs they neglect. If additionally, she wants to redistributes 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. The reason is that then the target population will benefit relatively more from the internality correction of the sin tax. The same applies if the poor's demand for the sin good is relatively elastic compared to the rich. But redistribution motives do not necessarily increase the sin tax. If, for a given behavioral bias, the poor consume more than the rich as they have a larger taste for the sin good (h_p is larger than h_r), then the sin tax redistributes away from the poor, as it tends to redistribute net-income resources from high to low sin good consumers, due to the lump-sum transfers redistributing sin tax revenues on a per-capita basis. This "regressivity effect" of corrective sin taxes is represented in the last term of (7).[6]

In sum, the optimal sin tax ceteris paribus increases in the views that a paternalist policy maker has about the severeness of internalities ($(1-\beta_p)$ and $(1-\beta_r)$). The same applies for her views over the externality e, if she is also a Pigouvian. Conversely, for given

[5]The ride-hand side (RHS) of (7) is a function of the tax rate, so (7) is a fixed-point equation. The marginal welfare rates average to one at the optimal policy solution. If the types are identical and receive the same Pareto weights, and if the G_i functions are linear, the RHSs of (7) and (4) coincide. The optimal tax of (4) is therefore nested in (7).

[6]If $x_p > x_r$, the third term in (7) is negative, since the marginal social weights average to one. Whenever 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.

views over the prevalence of internalities and externalities, preferences over the optimal tax we predict to increase in the degree of paternalism and in the externality weight, respectively. By contrast, the effect of redistribution motives on the sin taxes is theoretically ambiguous. Depending on whether or not the financial regressivity effect outweighs the interaction with internalities, the optimal sin tax might be either higher or lower (see also Gruber and Köszegi (2004) and Allcott *et al.* (2019a)).

2.2.2 Pocketbook motives

The optimal sin tax condition (7) applies if the social planner has policy motives driven by normative considerations, such as efficiency and distributional (fairness) concerns. Assume now that there is a policy planner motivated by selfish concerns instead, exclusively caring for her own rather than social welfare. To further simplify, assume that she wants to maximize her decision utility, $\tilde{U}_i$.[7] Denoting average consumption by $\bar{x} := (x_p + x_r)/2$, the pocketbook-driven policy maker's tax problem can be written as to maximize $\tilde{U}_i$ with respect to (t, T), subject to $T = t\bar{x}$ and $x_i = h \cdot [(1 + t + \beta c)]^{-1}$. At an inner solution, it must hold that

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

Intuitively, if the policy maker has below average consumption, she is a (net) benefiter from the redistributive nature of the sin tax, so she prefers a positive tax. Otherwise, she prefers a zero tax.

We can use (8) to derive predictions specific to a pure egoistic policy maker. Her most preferred tax depends, namely positively, on own consumption levels—which would not be the case for a pure welfarist policy maker. In terms of primitives of the model, we can totally differentiate (8) with respect to the taste parameter h. Assuming that indirect $\tilde{U}(t)$—the decision utility after having substituted for $T(t)$ and $x_i(t)$—is strictly concave in t, we obtain the following result

$$\frac{dt}{dh_i} = \frac{\frac{\partial x_i}{\partial h_i}}{\tilde{U}_i''} < 0, \tag{9}$$

[7] If an egoist bases her policy choices on experienced utility, anticipating that her decision self is biased, she demands sin taxes also as a commitment device (Haavio and Kotakorpi, 2011). As this motive overlaps with the welfarist tax, we mute, without loss of generality, this type of egoism to sharpen our predictions.

where $\tilde{U}_i''$ denotes the second derivative of indirect utility with respect with respect to t. Thus, a pocketbook maximizer's preferred tax is decreasing in her intrinsic taste for the sin good.

3 Survey and data

3.1 Recruiting of subjects and sample descriptives

We conducted an online survey and experiment on US residents aged between 16 65 with a final sample size of 3,871. We used soft quotas for gender, age, and income to obtain a sample that is broadly representative of the US population along these dimensions. Since our survey included information treatments with longer text passages, it is particularly important that respondents read the instructions carefully. We therefore also screened out participants who failed an attention check (9.95% of the raw sample).[8] Moreover, we exclude respondents who do not complete the survey (10.4% of the raw sample). The survey was issued at the beginning of December 2021, using the commercial survey company Respondi. The median completion time of the survey is about 12 minutes.

Table B.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.[9] Notably, our sample is roughly representative in terms of sugar intake from soft drink consumption.[10] Table B.1 shows also that the final sample and the unrestricted sample (the sample including respondents that are screened out) do not differ systematically in terms of background characteristics.

[8]The attention check is shown in Appendix F.5. It is placed after the background information questions of the survey.

[9]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)).

[10]Our respondents report to consume 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.

3.2 Survey questions and design

In the following, we present the survey questions and design. Figure B.1 in the appendix provides an overview of the survey. The complete survey instructions can be found in Appendix F. 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 respondents' background characteristics like gender, age, income, state, race/ethnicity, education, employment status, political affiliation, weight and height, as well as whether they have children.

3.2.2 Consumption preferences and own self control

In this section of the survey, we ask respondents about their own 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 the consumption of sugary beverages 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). The question asks for respondents' agreement with the statement "I drink soda pop or other sugar-sweetened beverages more often than I should" on a four-point scale. In line with Allcott *et al.* (2019a), we define individuals as having perfect self-control if they answered "Not at all." We also adapt a question from Allcott *et al.* (2019a) to survey respondents' intrinsic taste for soft drinks. Together with a measure for BMI, the above questions will be used to assess the role of pocketbook motives in people's demand for SSB taxes.

3.2.3 Free-text questions

The survey also contains a free-text part with open-ended questions. The open-ended questions are meant to elicit individuals' first-order reasoning about taxes, without priming them by the survey (Ferrario and Stantcheva, forthcoming). They ask respondents about their spontaneous thoughts that come to their mind when thinking about SSB taxes, the

goals they associate with them, and what they perceive to be the winners and losers of such taxes.

3.2.4 Views on the economic factors of SSB taxes

In this survey module, we include questions about respondents' views on the main factors shaping optimal sin taxes from an economics perspective (externalities, internalities, and regressivity). We ask respondents' to what extent they agree with the importance of the factors on a 5-point Likert scale. We randomized 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 SSBs and cigarettes, which generate 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 "[c]onsumption of sugary beverages imposes costs for others in the public health system." We also ask respondents what they think about that the "[c]onsumption 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. We ask respondents how empirically relevant they think these behavioral "deficiencies" are. To collect beliefs about health (cost) misperceptions, we let respondents rate their level of 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 "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 a respondents' agreement with this view, by asking to what extent they think that "Taxes on sugary beverages hit the poor the hardest," 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

At the end of the survey, respondents are asked to think about the legitimacy of paternalism and state intervention in general.

To measure normative views on paternalism, we let respondents' rate to what extent they agree with the statements that "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," and "The government should be responsible for reducing obesity." To capture people's general attitudes on government intervention, we ask them to what extent they agree with the statements "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." These questions could also be interpreted to capture libertarian views.

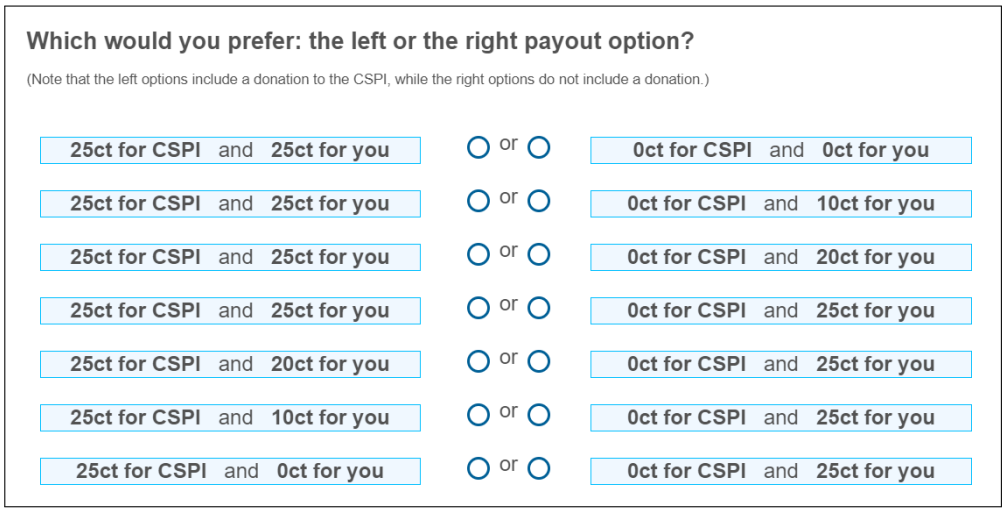
3.2.6 Preferences over SSB taxes

We elicit respondents' preferences over SSB taxes with both non-incentivized and incentivized elicitation techniques.

Stated preferences First, we elicit stated preferences regarding the introduction of a federal SSB tax in the US in a non-incentivized way: "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."

Moreover, we ask for a respondents' 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). Clearly, providing subjects with numbers can have framing effects. On the other, 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. The advantage of this question is

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 seven ranges where the WTP can fall into.

that it allows us to compare empirical policy views to recent calibrations of optimal SSB taxes.

Revealed preferences from donation decisions Second, we employ an incentivized measure for preferences over SSB taxes. In our questionnaire, respondents are given the opportunity to increase or decrease the probability of 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 recent goals of the CSPI is to lobby for the introduction of a federal tax on sugary drinks in the US.[11] The amount respondents are willing to give up to induce a donation to the CSPI can thus be considered a revealed preference measure for their attitudes towards the introduction of SSB taxes, based on costly choices.

Figure 1 shows the multiple price list we give the subjects. Individuals must choose between seven pairs of payment allocations. Let a payment allocation be denoted by

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

(x_i, x_j), where x_i is a payout for themselves in US cents, and x_j a donation to the CSPI. We choose the variable x_j to take on either 25 or 0, and x_i to take on different values between 0 and 25: $x_i \in \{0, 10, 20, 25\}$. We thus can bound a respondents' willingness to pay (WTP) for a 25ct donation to the CSPI.[12] For example, if an individual prefers the allocation $(20, 25)$ over $(25, 0)$, she is willing to give up at least 5ct to ensure the donation of 25ct to the CSPI. If at the same time she prefers $(25, 0)$ over $(10, 25)$, she values the donation with less than 15ct. The respondents' WTP for the donation thus falls into the interval $[5, 15)$.

The advantage of this multiple price list is that it allows to capture a negative willingness to pay for individuals, who strictly oppose SSB taxes. For instance, if a subject chooses $(20, 0)$ over $(25, 25)$, she is willing to pay at least 5ct to preclude us from donating 25ct to the CSPI, entailing a WTP of equal or smaller than -5ct. Ultimately, our multiple price list maps respondents' WTPs into the ranges $(-\infty, -25]$, (-25,-15], (-15,-5], (-5,0], [0,5), [5,15), [15,25), $[25, \infty)$.

Multiple price lists put relatively high demand on subjects' rationality—especially on subjects in an online survey. Whenever analyzing incentivized preferences, we will use only observations from subjects whose choices are internally consistent, that is, who exhibit at most one switching point. Moreover, we assign one unique WTP to each of the seven ranges. For inner ranges, we assign the midpoint of a WTP range. Subjects who never switch are assigned the corresponding endpoint of the scale. For instance, a respondent with a WTP in the interval $[15, 25)$ is given a WTP of 20ct, and a person in $[25, \infty)$ obtains a WTP of 25ct.[13] 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 C.

3.2.7 The spectator perspective

We also ask subjects to state their preferences over SSB taxes in a state other than the one the respondent lives in. We elicit stated preferences over taxes in California or, if the

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

[13] We choose the endpoints such that they coincide with the donation amount, in our case 25ct. The reason is that a respondent could also make a donation outside the experiment, from the survey's show up fee. Therefore, it would not make a lot of sense for a person to give up more than 25ct for a 25ct donation (assuming transactions from own donations are low). Although it would not be irrational *per se* to have a WTP of more than 25ct to prevent us from donating 25ct, we decided to keep the scale symmetric and choose parameters such that the minimum WTP is -25ct.

respondent lives in California, in Pennsylvania. Unlike the federal tax in the first outcome measure, the tax in another state would not directly affect the respondent—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 own immediate personal involvement.

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 representative sample of more than 1000 US households. 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. Afterwards, we analyze views on the economic underlyings of SSB taxes. We then assess the predictive power of the views for policy preferences. Finally, we address partisan gaps in views over sin taxes.

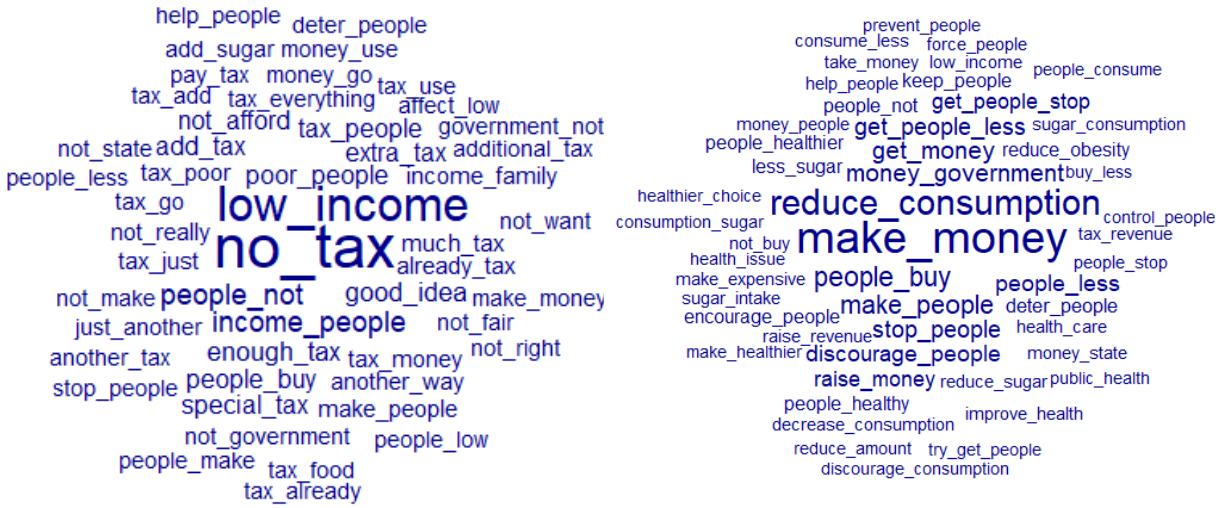
4.1 Text analysis of first-order considerations

Figure 2a provides a graphical representation of the expressions the respondents used the most when asked for the "main considerations" that come to their mind when they think about sugary drink taxes, by plotting word clouds for the most frequently mentioned 2-grams. 2-grams are basically sets of two words, which appear the texts written down by the respondents.[14] 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 most express an aversion to the tax ("no tax"), which is accompanied by general tax aversion ("enough tax", "extra tax", "tax everything", "not need") and concerns about the regressivity of such a tax ("low income", "poor people", "income people", "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 for 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 a SSB tax. In fact, respondents often understand the tax as a

[14] In Appendix E, 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 and keyness graphs of main considerations regarding a SSB tax and its possible introduction. Panel (a) shows the most frequent 2-grams and Panel (b) a comparison of the relative frequency of 2-grams by Democrats and Republicans (by their chi2).

way to induce behavior change ("stop people," "discourage 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 it mainly as a way to generate tax revenue ("money government," "get money," "raise money"). Some respondents consider SSB taxes as patronizing ("control people," "force people"), thereby expressing reservations against paternalistic intervention.

These patterns are reinforced when looking at opinions about who would be the beneficiaries and losers of a SSB tax. Figure E.4a 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 in Figure E.4b, many respondents are concerned about the regressivity of the tax ("low income," "poor," "low class"), but also "everyone" and "no one" are popular answers. Moreover, some respondents mention adverse economic impacts ("soda company," "industry," "business").

Taken together, the free-text questions reveal that individuals' spontaneous thoughts about a SSB tax are often critical, mostly because it is perceived as regressive, and because of a general scepticism against additional taxes and paternalistic state intervention. While

some respondents view the SSB tax purely as a means to generate tax revenue, the perceived goals of a SSB tax also (but less often) comprise ideas of corrective taxation to change behavior for the sake of improving health.

4.2 Baseline preferences over SSB taxes

In this section, we present descriptive results on preferences over SSB taxes among US households, based on our closed-form 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.[15] A majority of respondents (65.9 percent) state that they are against having SSB taxes (42.1 percent answer with"strongly opposed" and 23.8 percent with "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 than those 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). 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 48ct per liter, as calculated by Allcott *et al.* (2019a). Those who express to "Neither favor nor oppose" SSB taxes prefer a SSB tax of about 20ct per liter. And for those who state to "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 over SSB taxation.[16] Overall, however, the categories for the introduction of SSB taxes strongly correlate with most preferred taxes, cross-validating the measures.

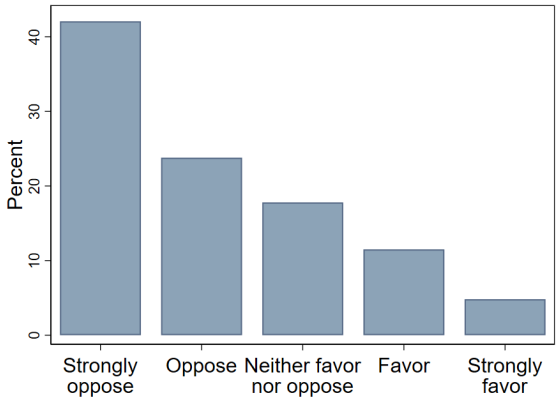
4.2.2 Incentivized preferences

In the following, we provide descriptives for our revealed preference measure, the WTP for the donation to a public health organisation lobbying for the introduction of a federal SSB

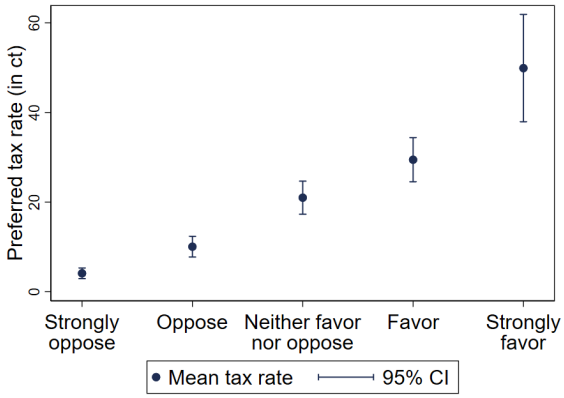
[15] 7.8 percent of the respondents answer with "neither favor, nor oppose", 16.3 percent with either "favor" or "strongly favor".

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

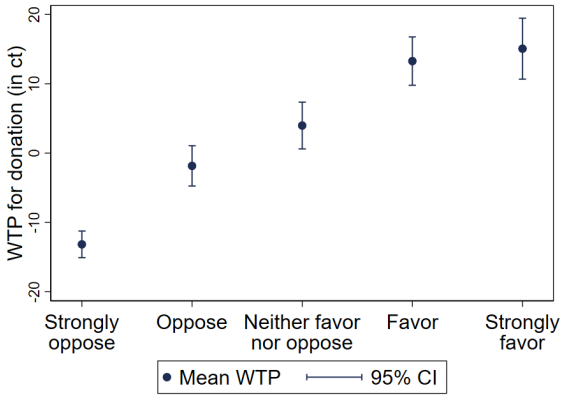
Figure 3: Preferences over sin taxes in the control condition



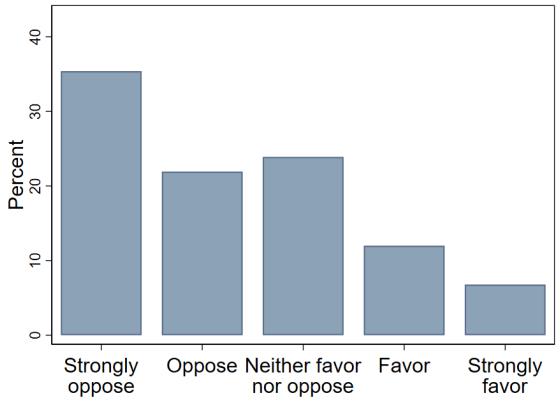
(a) Preference for federal tax



(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 over SSB taxes in the control condition. 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 a SSB tax in a state other than the one they live in (California or Pennsylvania).

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.[17]

Figure B.6 in the appendix illustrates the CDF of our WTP measure. An overwhelming share of respondents are not indifferent to the possibility to induce or to prevent us from a 25 cent donation to the CSPI.[18] Around 30 percent of the subjects have a strictly positive WTP—these subjects are willing to give up at least 10 cents to trigger a donation of 25ct. By contrast, almost half of the respondents (47.5 percent) have a strictly negative WTP. Interestingly, 42 percent choose the maximum amount we offer to prevent us from the donation, that is, have a WTP of less or equal -25 cent. Hence, the polarization of policy views we already seen in the free-text answers also translates to our incentivized preferences 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.[19]

4.2.3 Correlation of tax preferences with demographics

Figure D.1 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 having children. There are strong differences by political affiliation though: 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 over sin taxes in detail. All regressions to follow will control for these background characteristics.

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

[18]Only 16.1 percent are assigned a WTP of -2.5ct or 2.5ct, which would be consistent with own payoff maximization (see the shaded area in Figure B.6).

[19]Figure 3c shows that the WTPs are positively correlated to answers of the stated preference question, further verifying that stated preferences over sin taxes are aligned with incentivized behavior in our experiment.

4.3 The economic underlyings of SBB taxes

The economic underlyings and aspects of corrective taxation, such as externalities and internalities, are well documented in the economics literature. Little is known, however, about how important people perceive these phenomena to be. For instance, do individuals believe that sin consumption generates may generate externalities? Do individuals perceive behavioral biases to play a role? What do individuals think about the distributional effects of corrective taxation? How widespread are reservations against paternalistic intervention?

4.3.1 Main economic channels: Externalities, internalities and regressivity

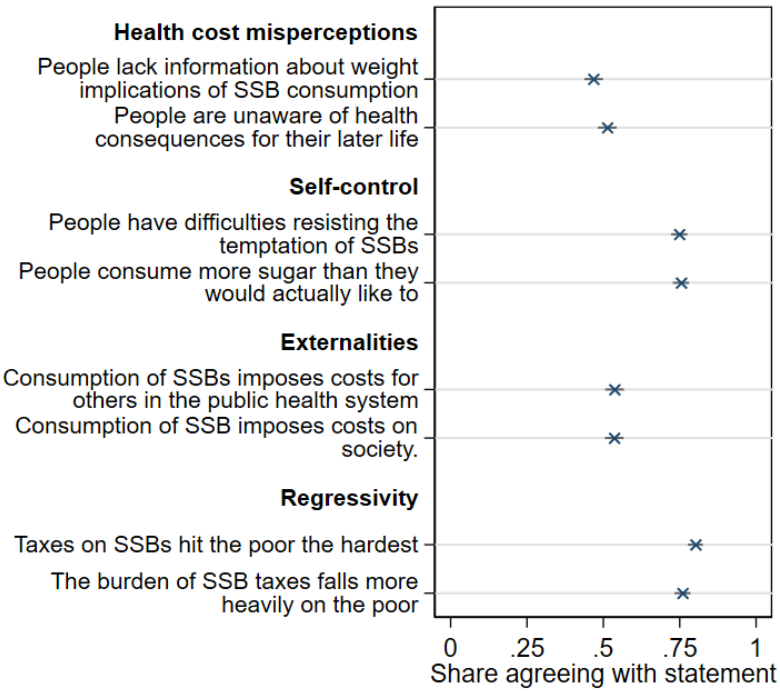
A number of studies have estimated high health cost externalities from obesity and argue that high sugar consumption is one of the main culprits of this phenomenon (e.g., Cawley and Meyerhoefer, 2012; Wang *et al.*, 2012).[20] Figure 4 shows that about **XX percent** of the respondents agree with the 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 SBB consumption empirically relevant.

Many recent 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 (e.g., Sadoff *et al.*, 2020; Allcott *et al.*, 2019a; Read and van Leeuwen, 1998).[21] In our survey, about half of our 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 say 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 for soft drink consumption.

[20] 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 back-of-the-envelope calculation of health externalities from sugar intake, see Allcott *et al.* (2019a).

[21] Allcott *et al.* (2019a) have recently provided 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 rationales



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.

Taxes on SSBs are often criticized for being regressive. As argued by Gruber and Köszegi (2004) and Allcott *et al.* (2019b), the financial regressivity must however be weighted 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."

4.3.2 Effectiveness of SSB taxes, pocketbook motives, and paternalism

The effectiveness of SSB taxes depends primarily on the price elasticity of demand for SSBs. Studies using instrumental variables strategies or structural approaches find demand for SSBs to be relatively price elastic (elasticities of -1.4 in Allcott *et al.* (2019a), -0.9 in Dubois *et al.* (2020), -1.6 in O'Connell and Smith (2020), -1.2 in the survey by Powell

et al. (2013)). Policy evaluations of local (city-level) taxes in the US provide 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.[22] 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). In our survey, 40.8 percent of respondents expect that a SSB tax leads to an at least moderate reduction in SSB consumption, whereas only 32.6 percent expect an at least moderate effect on overweight and obesity. Hence, 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 respondents believe that the introduction of a tax on sugary drinks would reduce SSB consumption and overweight and obesity "a little" or "none at all."

Our model of self-interested pocketbook motives predicts that consumers with a stronger taste for SSBs prefer a smaller SSB tax. In our data, almost 70 percent state to have an intrinsic preference for sugary soft 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. In contrast, if individuals are sophisticated about their self-control problem, they may demand sin taxes as a commitment device to combat their own overconsumption.[23] In our data about 59 percent of subjects 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 only 15 to 31 percent of subjects are willing to remove tempting choices from other subjects' choice sets, and that these paternalistic choice also predict support for real-world paternalistic policies like SSB taxes. Our closed-form responses reveal that paternalistic attitudes are similarly low among the US population. For instance, only 15 percent of the respondents agree with the statement that "Limiting a person's autonomy to promote her own good is acceptable," and only 27 percent find that "Intervening with a person's choices is justified if

[22]Pre-post analyses of federal taxes in other countries suggest that SSB taxes reduce purchases and consumption (e.g., Colchero *et al.*, 2016, 2017; Schmacker and Smed, 2020). However, these studies lack a geographical control group.

[23]For example, Gruber and Köszegi (2004) find evidence that smokers report to be 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.

the person interfered with will be protected from harm." 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 interfere with what people eat or drink." Taking together, this suggests that state interventions in food choices are seen particularly critically.

4.4 Decomposing policy views over SSB taxation

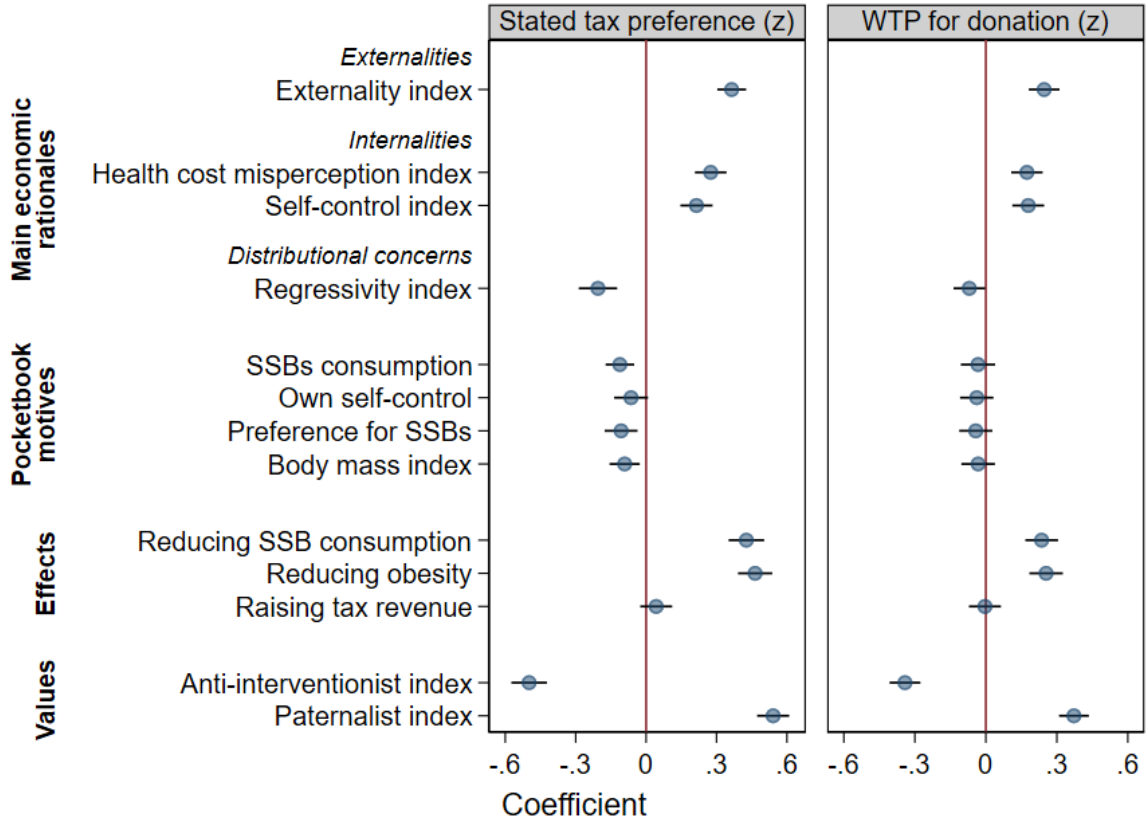
In this section, we put things together and decompose views over SSB taxes into primary factors of reasoning, following an approach suggested by (Stantcheva, 2021). The idea is as follows. From our above analysis, we know individuals' views on various factors and aspects which determine the optimal SBB tax from a theoretical perspective. However, 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.[24] To assess whether factors are constitutive for 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 economic underlyings and effects of SSB taxes for policy preferences. The idea is that if people's level of agreement of the importance of certain factors predicts their policy preferences, this suggests that these factors also matter for the formation of policy views. In particular, we will regress our measures for SSB 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 by the standard deviation. When using indices, we take the average of the standardized items and z-standardize again. Thus, we can shed light, at least descriptively, on what factors individuals employ when thinking about SSB taxes and what factors matter the most for them.

The left panel of Figure 5 shows the results for stated policy preferences. Each line plots the marginal effect of the respective factor. These marginal effects stem from separate OLS regressions, in which we use a stated policy index, summarizing views over the

[24] For instance, people may perceive soft drink consumption as tempting (as they do in our data). If they also think that food choices should be respected, they still might not want to resort to SSB taxes—even though they hold internalities to play a role.

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 regression control for the background characteristics from section 4.2.3. Except the controls, all variables are z-standardized. Only the control group is used for the estimations.

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 preferences. In particular, higher scores on the externality index go along with higher scores on the stated policy index, meaning that individuals who find externalities from SSB consumption relevant, also have a stronger preference for SSB taxes. The same applies for individuals who think that misperceptions and self-control problems play a role: 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 for the tax. Thus, all these factors have the sign as predicted by our simple model of corrective taxation.[25]

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 to the tax by 0.36 standard deviations, which is about the same magnitude as the gap between Democrats and Republicans. The belief that internalities matter increases the support for the tax as well: A one standard deviation increase in the health cost misperception index increases the policy index by 0.27 standard deviations, while agreement with the self-control index increases it by 0.21 standard deviations. In addition, believing that SSB taxes are regressive, decreases their support by 0.21 standard deviations.

The pocketbook factors show consistently the smallest coefficients. Higher SSB consumption is associated with lower preferences for a SSB tax, which is also the case for a higher BMI and a stronger taste for SSBs. The signs are in line with a standard pocketbook reasoning, according to which high SSB consumers should oppose a tax on SSBs since it makes them financially worse off. Overall, the coefficients related to own 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 pocketbook voting.

Normative economic models also make the prediction that SSB taxes should be higher if they are effective to combat the negative health effects of SSB consumption. We would therefore expect people's belief 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

[25]It is theoretically unclear whether sin taxes are regressive, but if people agree that they are regressive then they should have lower preferences for SSB taxes, provided they care for redistributional effects.

effectiveness belong to the strongest predictors of SSB tax preferences, further indicating that efficiency concerns play a role.

Finally, the paternalist and the anti-interventionist indices are highly predictive of preferences over the SSB taxes. A one standard deviation increase in the anti-interventionist index is associated with a 0.50 standard deviations decrease in the preference for the tax. A one standard deviation increase in the paternalist index is associated with a 0.54 standard deviations higher preference for the tax. These factors are the strongest predictors, suggesting that broader political values play a major role in people's reasoning over SSB taxes, which is in line with our results from the free-text analysis.

The right panel of Figure 5 shows the marginal effects of the factors when using the (z-standardized) willingness pay for a donation to an organization supporting SSB taxes, a revealed preference measure, 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 views; none of the pocketbook motives are statistically significant.

In Tables B.2 and B.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, 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 contrast, variables related to own consumption are not strongly associated with preferences over taxes, even when controlling for political attitudes and the economic factors.

4.5 Robustness: preferences about SSB taxes in another federal state

A potential concern with the previous analysis is that we ask for the introduction of a federal tax, which could affect the respondent herself in a variety of ways. For example, an individual may assign different importance to externalities depending on how much externalities her own consumption generates. Hence, normative factors may be intertwined with pocketbook motives.

To dampen pocketbook motives, we employ an approach akin to a spectator design, in which we ask individuals about their support for the introduction of a SSB tax in an US

federal state they do not live in. Thus, we elicit individuals' preferences over policies that do not apply for themselves but for another group of individuals.

Figure 3d shows subjects' preferences over 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 less subjects state to be strongly opposed, the plot looks remarkably similar to their approval to the federal tax in Figure 3a.

In Figure B.3 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 quite similar to those before (also in terms of magnitude): again, the externality index, the regressivity index, effectiveness beliefs, and especially the political value indices (paternalism and anti-interventionism) belong to the strongest predictors. These results support the view that preferences over sin taxes are greatly shaped by general normative considerations, and less by pocketbook motives.[26]

4.6 Partisan gaps

So far, we have seen that Democrats are less opposed to corrective SSB taxation than Republicans. In the following, we shed light on whether there are partisan gaps in individuals' views and reasoning about SSB taxes.

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 for whether there are differences in the usage of 2-grams between Democrats and Republicans.

Figure B.4a plots the keyness scores for the 2-grams for the "main considerations" regarding the implementation of a 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.[27]

[26]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 over 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 that, 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 consumption of SSBs and tastes more directly.

[27]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 group. If a 2-gram is common, but used relatively

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, voice more often 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 shows also up in the responses to the questions about the perceived goals (see Figure B.4b) and the potential winners of the tax (see Figure B.4b). Republicans significantly more often state that the goal of the SSB tax is to raise tax revenue for the government ("make money") or to patronize people ("government control"), whereas 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 Demcorats are more likely to mention "everyone" and "obese people".[28]

4.6.2 Partisan gaps in closed form answers

Next, we consider the closed-ended survey questions.

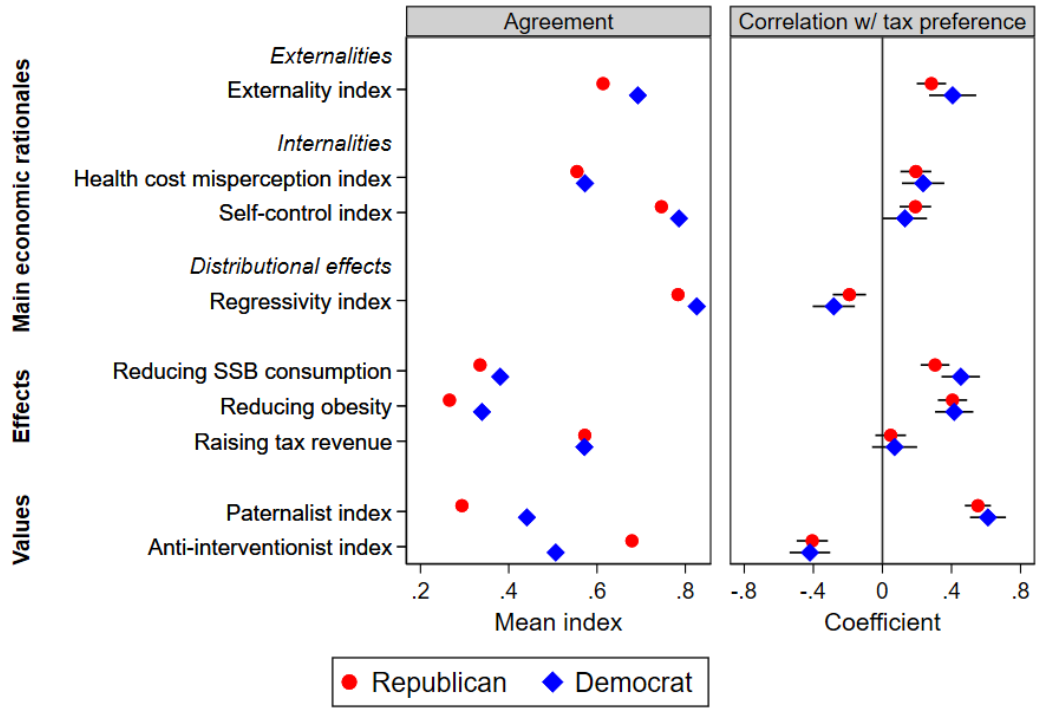
The left panel of Figure 6 plots the average scores on the indicies summarizing the different views underlying SSB taxes, split by political affiliation. In line with the answer to the free-text questions, Democrats agree somewhat more with the corrective motives of the tax, in particular with the externality index ($p < 0.01$) and the self-control index ($p < 0.05$). Similarly, Democrats do agree more that the tax is regressive ($p < 0.05$). Yet, it should be noted that these differences are only small in absolute 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 substantially higher on the paternalist index, and Republicans substantially lower on the anti-interventionist index. Hence, Democrats and Republicans differ substantially in their views regarding the scope of state intervention.

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 (forthcoming).

[28]However, when explicitly asked about the losers of the tax, Democrats more often mention "business" owners as primary losers—"low income" and "poor" are mentioned by both groups to similar degrees.

Figure 6: Partisan differences in attitudes and beliefs



Notes: The left panel shows the sample mean of the respective indices. The indices are on a scale from 0 to 1 by summing up the scores and dividing by the maximum score. 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.

Interestingly though, all these 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 taxes, which are slightly more predictive of the tax policy index for Democrats.[29] However, these differences are not statistically significant.

Taken together, we do not see that Democrats and Republicans overly disagree about the importance of the economic underlyings of SSB taxes. Moreover, they weigh in these

[29]For instance, for Democrats, a one standard deviation increase in the externality index increases the policy index by 0.41 standard deviations, while it increases the policy index for Republicans by 0.28 standard deviations. A one standard deviation increase in the effectiveness to reduce SSB consumption increases the policy index for Republicans by 0.45 standard deviations and for Republicans by 0.30 standard deviations.

factors similarly in their policy 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 sceptical of state intervention in general. In a nutshell, there does not seem to be a strong "polarization of reality" (Alesina *et al.*, 2020) in terms of the economic phenomena underlying SSB consumption, nor are there sizable differences with respect to the importance of these factors for the preference formation over SSB taxes. What Democrats and Republicans are instead strongly polarized about is their basic normative views about the legitimacy of (paternalistic) state intervention.

5 Can information treatments shift preferences over sin taxes?

So far we have seen that preferences over 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 over sin taxes are non-malleable? In this section, we analyze whether explaining 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 to discourage 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 additional information

about the source of inefficiency in SSB consumption, but instead we point to distributional consequences of sugary taxes, by explaining 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. We estimate the reduced form effects of the instructions for policy preferences, providing belief manipulation checks to test for the channels.

5.2 Information treatments

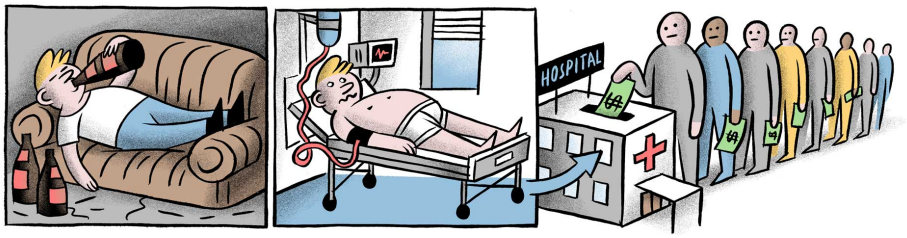
The information treatments are the following:

Externalities treatment We explain 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 into 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.[30]

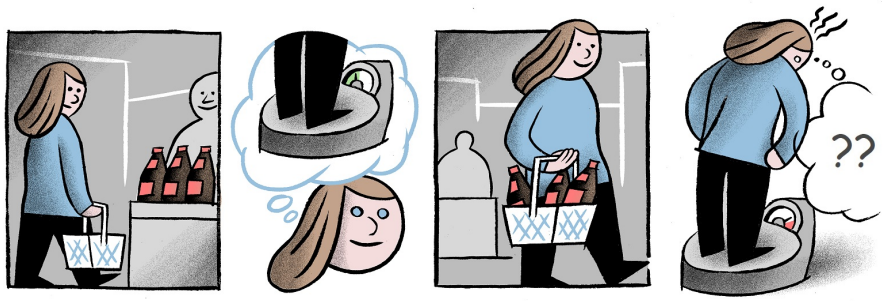
Health cost misperception treatment In this treatment, we explain subjects that people may not have perfect knowledge of the health costs of their SSB consumption, which may lead to overconsumption from the individuals' long-term perspective. We illustrate this argument with an example of a person who 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. The explanation is visualized with a cartoon (see Figure (7b)). Afterwards, we let respondents estimate the share of individuals who underestimated the weight implication of sugary

[30]Respondents answer, on a slider from 0 to 100, the question about how many out of 100 dollars health costs are paid for by others in the health system. Their guess is compared to Cawley and Meyerhoefer (2012), which estimate this number to be 88 dollars. Quiz feedback is given at the end of the survey.

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

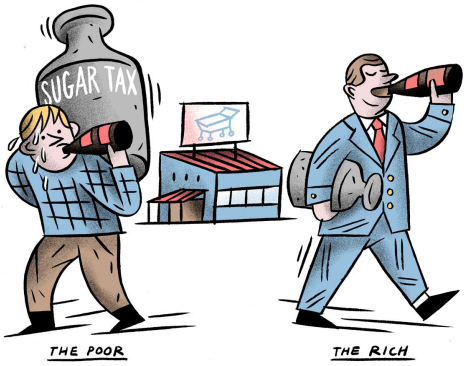


(a) Externality treatment



(b) Health cost misperception treatment

(c) Self-control treatment



(d) Regressivity treatment

beverages in our pre-survey. Respondents, who are within three points of the true share, receive the bonus payment.[31]

Self-control treatment This treatment captures the idea of time-inconsistent preferences over sin goods: in the heat of the moment, an individual values the sin good (relative to its costs) 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. This example is visualized with a cartoon, too (see figure 7c). Afterwards, we asked 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 it is discussed to introduce taxes on sugary beverages due to their negative health consequences. However, we point out that the burden of a SSB tax is higher for poorer than for richer consumers since the expenditure for sugary beverages make up a larger part of the income of the poor. This argument is visualized by a cartoon, in which a poor SSB consumer carries a larger tax weight on his shoulders (see figure 7d). Afterwards, we ask respondents what they think 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. The guess is compared to the results in Allcott *et al.* (2019a), the true number being 50. As in the other treatments, feedback is provided at the end of the survey.

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 pay a higher share of their income into sin taxes. However, as with the other

[31] 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. This we inform subjects about in our main survey, and we ask them to guess the share of the pre-survey respondents with an answer falling more than 10 percent below of "what nutrition scientists predict." 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.

treatments, also the general idea of corrective taxation is explained (that SSB taxes discourage the consumption of an unhealthy food item). This may also shift channels that lead to a higher support of sin taxes (e.g., health externalities beliefs).[32] Therefore, as also a counterargument to SSB taxation is presented, at least we would expect that the treatment effect on the support of sin taxes should be smaller in magnitude, compared to the other treatments.[33]

5.3 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 rationale 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. 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 are not exclusively shifting the agreement with the concepts that they primarily aim to explain. Instead, some of the treatments have spillovers on agreement with the other indices. For example, also the self-control, health cost misperception, and the regressivity treatment 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 also think about other, related aspects. It is however reassuring that the economic aspects that a given treatment targets react the strongest.

Table 1: Treatment effects on agreement with economic underlyings

	(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 Cent for a 25ct donation to the CSPI, and in Column (5) it is a dummy whether a respondent favors a tax in another state. Robust standard errors are in parentheses. Significance levels are indicated by * $< .1$, ** $< .05$, *** $< .01$.

5.3.2 Treatment effects on preferences over SSB taxes

The treatments effects on policy preferences are represented 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 in Columns 2 and 3, the effects are driven by an increase in stated support for the tax and positive (but less precise) effects on the preferred tax level. That is, explaining respondents the ideas of corrective taxation has a positive treatment effect on individuals' preferences over SSB taxation, 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 a SSB tax as a dependent variable, the indicator for the regressivity treatment becomes significant, too. 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. Moreover, Wald tests show that this treatment coefficient is significantly smaller than the coefficients for the self-control ($p < 0.05$), health cost misperception ($p < 0.10$), and the externality treatment ($p < 0.05$). Hence, compared to the externality and internality treatments, preferred tax rates are significantly smaller in the regressivity treatment.

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

[32]Pointing out that the poor consume a higher share of their income in SSBs may also invoke beliefs of a larger behavioral biases for the poor. It turns however out that the regressivity treatment make respondents believe more that SSB taxes hit the poor the hardest, and hence, fuels regressivity beliefs.

[33]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.

distributional consequences for the poor makes a difference for individuals' preferred level of corrective taxation.

In Figure B.6 in the appendix, we shed further light on the effects of rationalizing the ideas of corrective taxation on the general approval of introducing SSB taxes. The figure plots the pooled treatment effect on the distribution of the WTP for a donation to the CSPI. It shows 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. In Table B.5, we show that the treatments significantly reduces the share of respondents with a WTP of -25ct and significantly increases the share with a weakly positive WTP, but do not increase the share with a WTP of +25ct. These patterns suggests that explaining the ideas of corrective taxation predominantly affects policy preferences by reducing strong opposition against the tax.

5.3.3 Heterogenous treatment effects

As shown in Section 4.6, there are strong partisan differences in baseline preferences for SBB taxation, with Republicans being generally more opposed towards corrective soft drink taxation. But are there also partisan differences with respect to the responsiveness to our experimental intervention?

In Table B.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 is a 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. We conclude that 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 over the whole population.

5.3.4 Treatments effects on policy values

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

In Figure B.7 we plot the coefficients we obtain when regressing the paternalism and anti-interventionist indices on the treatment dummies variables, controlling for background

characteristics. Not all treatment coefficients are significant, but there is a quite systematic pattern with respect to their sign: All treatment coefficients show a positive sign positive for the paternalism index, but a negative sign for the anti-intervention index. We conclude that rationalizing the ideas of corrective taxation seem to make individuals more agree with the basic premises of paternalism, that interfering with individuals' decision autonomy can be normatively justified. What is more, also the degree of people's reluctance against state intervention in general tends to reduced by our experimental interventions.

6 Conclusion

There is growing research interest in the question of how people think and reason about economic policy instruments (Stantcheva, 2020, 2021). While this research mostly focuses on redistributive taxes (on income and wealth), little is known about people's reasoning over corrective taxes that aim to improve welfare.

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 (fairness) concerns. Pocketbook considerations play only a minor role. Instead, people seem to factor in broader normative considerations that relate to the very nature of corrective taxation to change and redirect behavior: preferences over SSB taxes are largely shaped by views on how legitimate an 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 have direct preferences over policy instruments *per se*, adding a twist on standard efficiency and fairness (trade-off) reasoning. It remains to be shown for future research to which policies such "direct" preferences translate, and to what extent they may interact with culture and social context.

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Appendix

A 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.

A.1 Externalities treatment

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

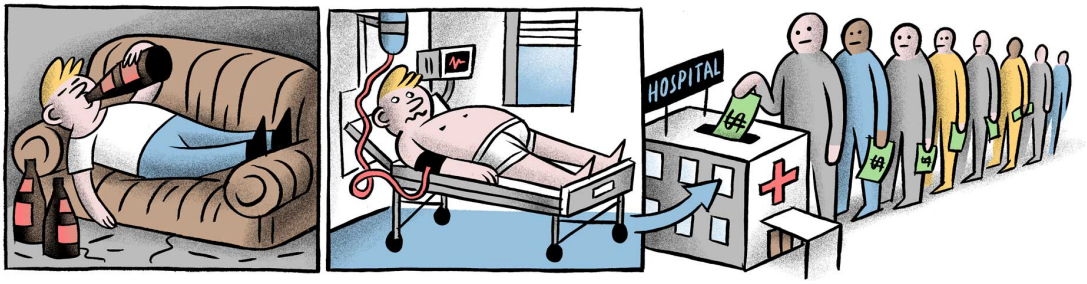
The consumption of sugary beverages may cause negative health consequences, imposing medical costs on society as a whole. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

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]*

A.2 Health costs treatment

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

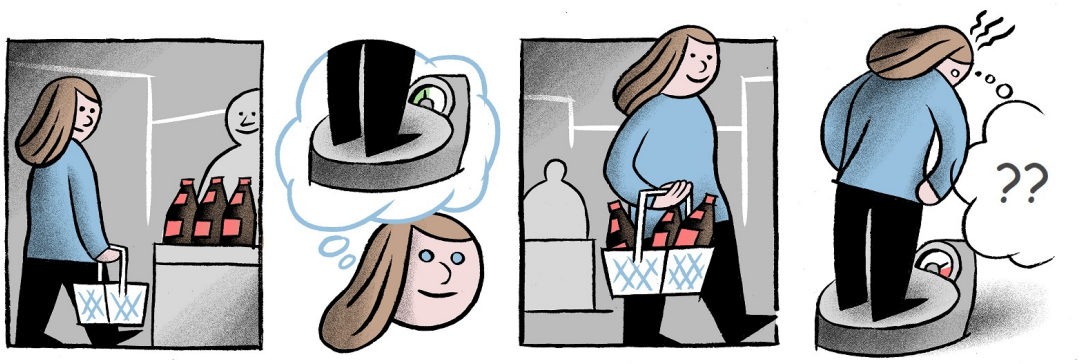
Researchers argue that individuals tend to overconsume sugary drinks, compared to what is in their long-term self-interest. The idea is that people may not have perfect knowledge about the negative health consequences of sugary drinks. Therefore, introducing taxes on sugary beverages to reduce their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

A.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]*

A.4 Regressivity treatment

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

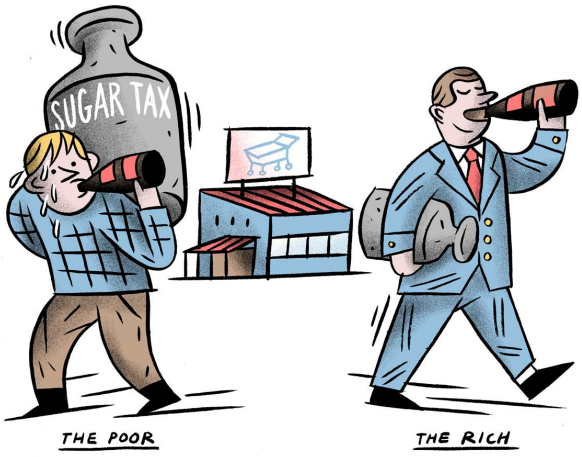
Routinely drinking sugary beverages can have negative health consequences. Therefore, introducing taxes on sugary beverages to reduce their consumption has become a subject of discussion.

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.


SUGAR TAX
THE POOR
THE RICH

B Additional tables and figures

Figure B.1: Experimental Design

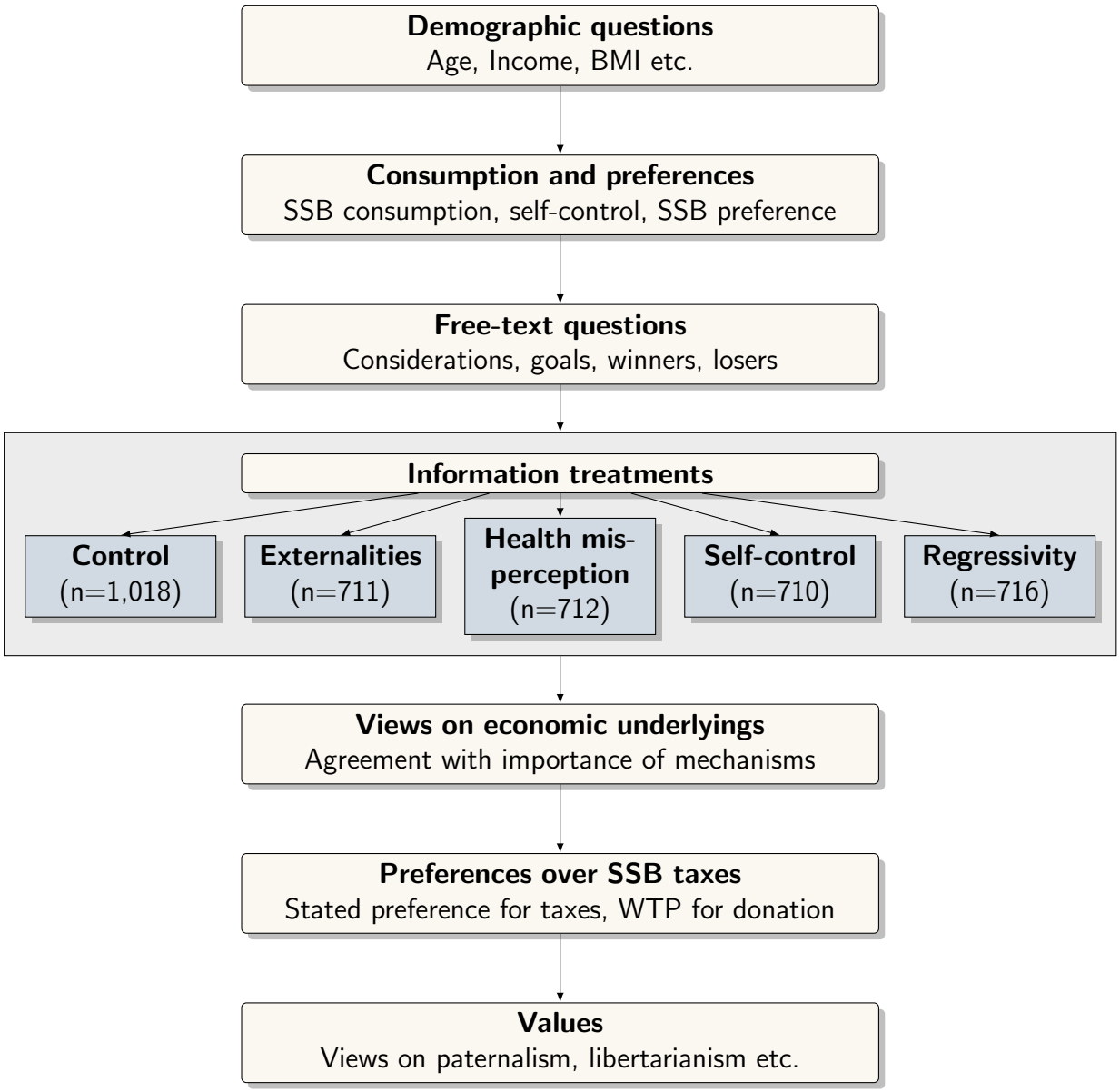
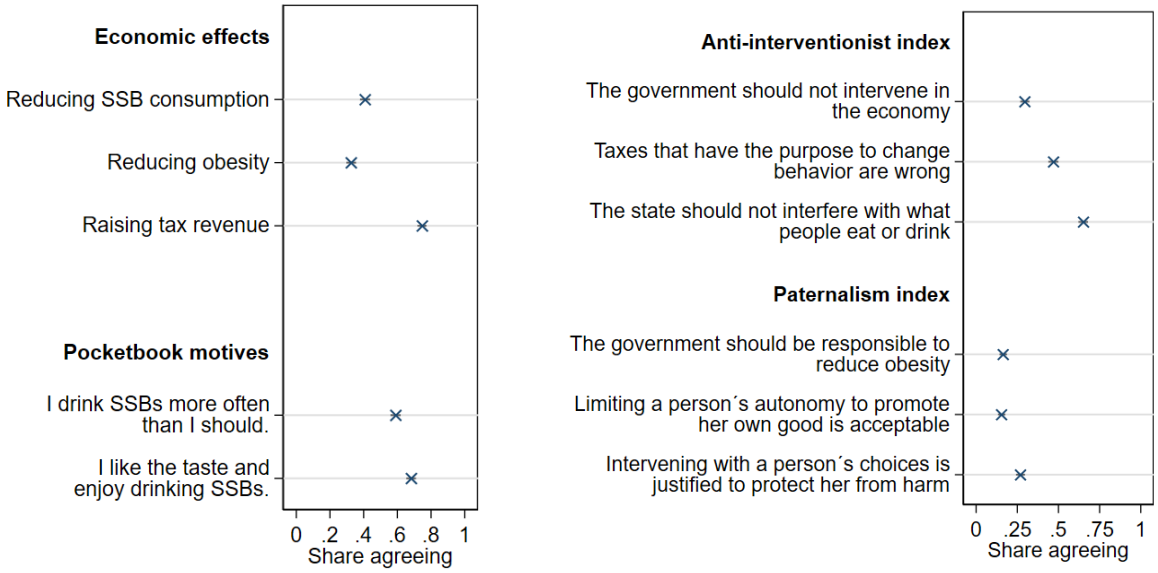


Table B.1: Descriptive statistics

	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 B.2: Agreement with effects, pocketbook motives, and values



(a) Economic effects and pocketbook motives

(b) Political values

Notes: The figure shows the agreement with the given statement with 95% Wilson confidence intervals. Panel (b), for economic effects, this is the share of respondents who state that the SSB tax entails the described outcome "A moderate amounts," "A lot," or "A great deal." For pocketbook 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. In Panel (a), it is the share of respondents who agree or fully agree. Only respondents from the control condition are considered.

Table B.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					
SSBs 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 regression estimates. Significance levels are indicated by $* < .1, ** < .05, *** < .01$.

Table B.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					
SSBs 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

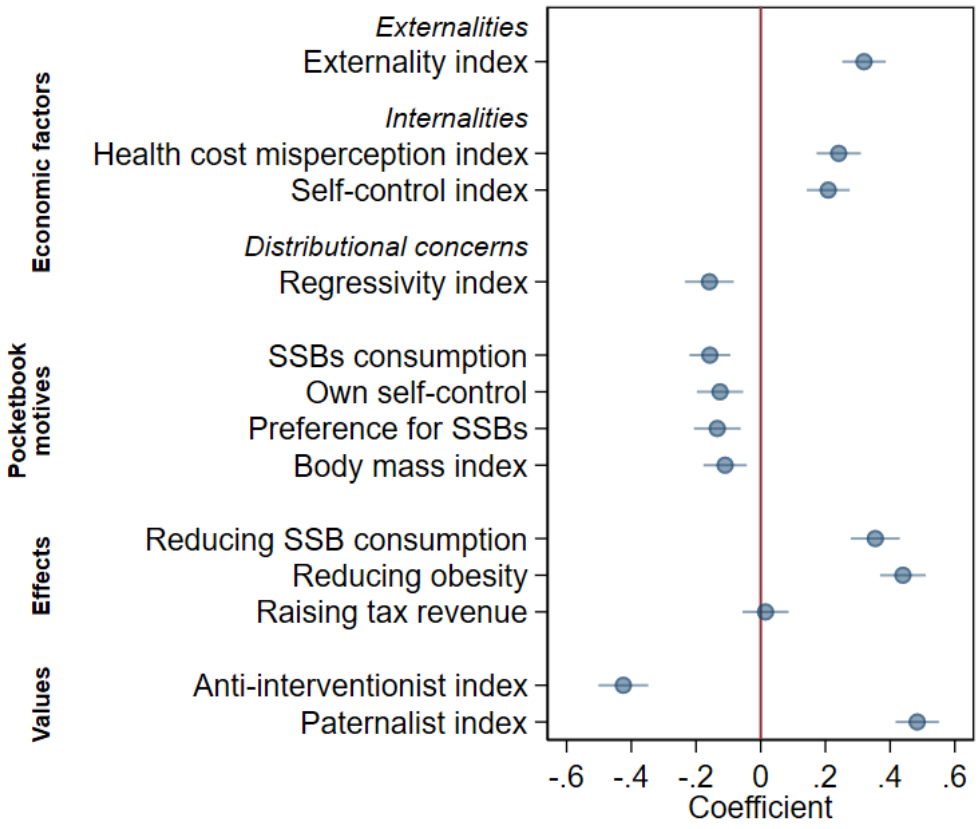
Notes: The table reports OLS regression estimates. Significance levels are indicated by $* < .1, ** < .05, *** < .01$.

Table B.4: Correlations with preference for tax in another state

	(1)	(2)	(3)	(4)	(5)
Arguments					
Externality index		0.240***	0.221***	0.171***	0.153***
		(0.034)	(0.034)	(0.033)	(0.033)
Health cost misperception index		0.138***	0.134***	0.075**	0.070**
		(0.032)	(0.031)	(0.031)	(0.031)
Self-control index		0.082**	0.091***	0.084**	0.094***
		(0.034)	(0.034)	(0.033)	(0.033)
Regressivity index		-0.186***	-0.179***	-0.122***	-0.115***
		(0.032)	(0.032)	(0.032)	(0.032)
Own consumption					
SSBs consumption			-0.079***		-0.076***
			(0.030)		(0.028)
Own self-control			-0.011		-0.015
			(0.038)		(0.035)
Preference for SSBs			-0.052		-0.049
			(0.034)		(0.032)
Body mass index			-0.044		-0.043
			(0.028)		(0.027)
Presumed effects					
Reducing SSB consumption				0.034	0.037
				(0.047)	(0.046)
Reducing obesity				0.297***	0.293***
				(0.047)	(0.046)
Raising tax revenue				-0.052*	-0.059**
				(0.028)	(0.028)
Political affiliation					
Republican	-0.244***	-0.258***	-0.239***	-0.255***	-0.238***
	(0.077)	(0.070)	(0.071)	(0.067)	(0.067)
Democrat	0.140*	0.088	0.102	0.047	0.060
	(0.078)	(0.072)	(0.071)	(0.067)	(0.067)
Controls	✓	✓	✓	✓	✓
Adj. R2	0.055	0.197	0.207	0.279	0.289
Observations	1001	1001	1001	1001	1001

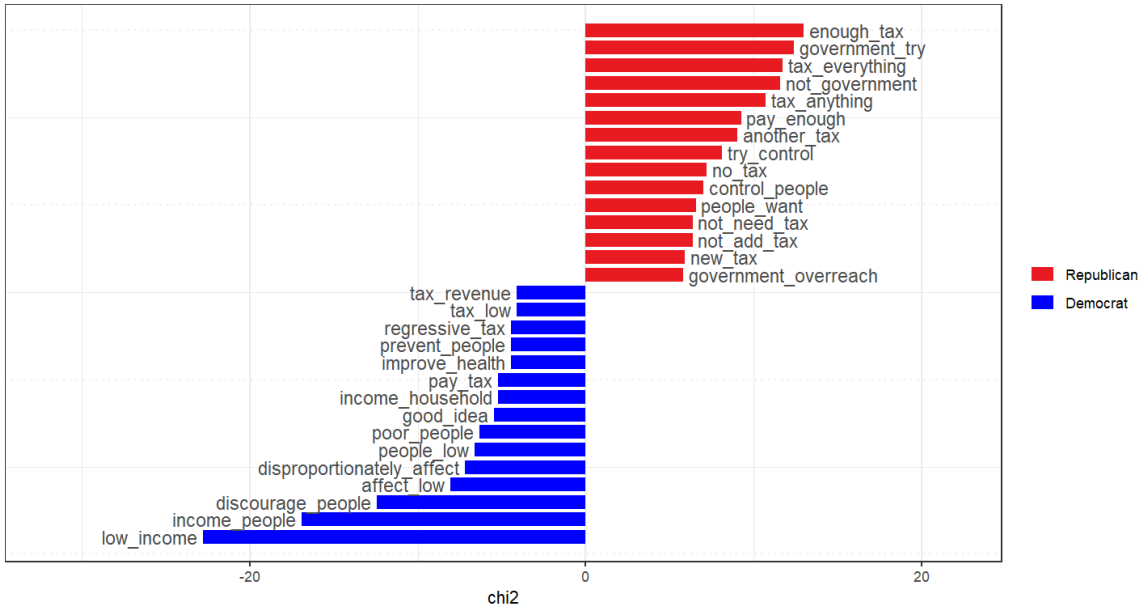
Notes: The table reports OLS regression estimates. Significance levels are indicated by $* < .1, ** < .05, *** < .01$.

Figure B.3: Correlations with stated preference for tax in another state

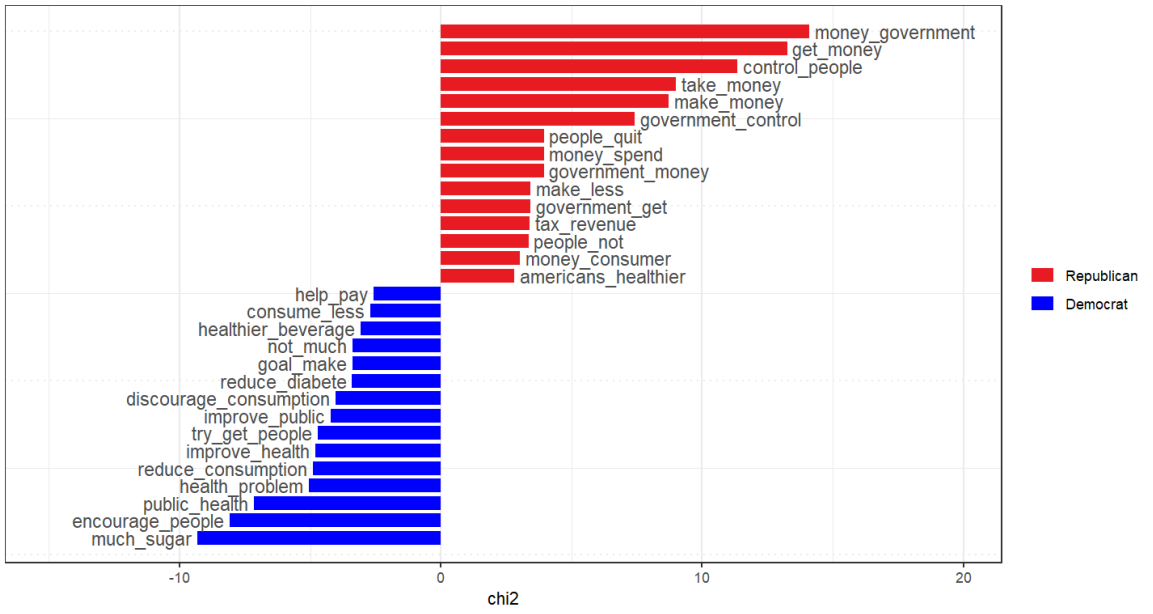


Notes: Graph shows coefficients and 95% confidence intervals from separate regressions of the preference for the tax in another state on the respective variables and control variables (as specified in Equation X). All variables are z-standardized except for the party affiliation, which are dummy variables.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

Figure B.4: Keyness graphs by political affiliation



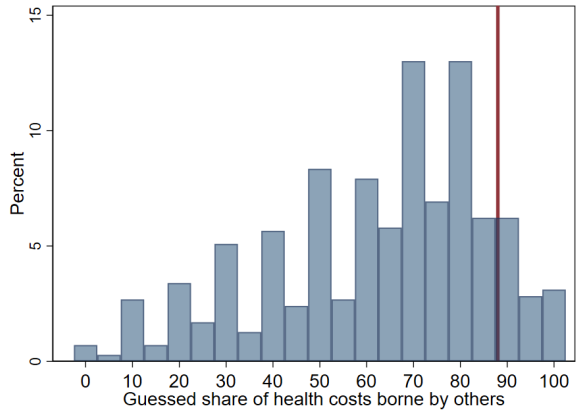
(a) Main considerations



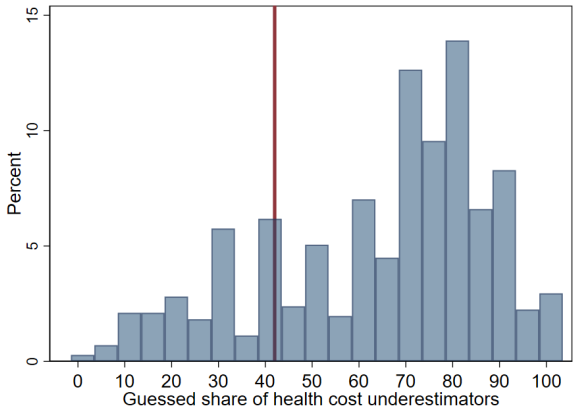
(b) Goals of a SSB tax

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

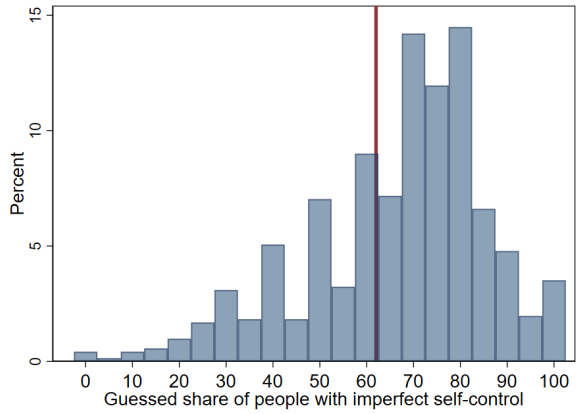
Figure B.5: Distribution of guesses in the respective treatment



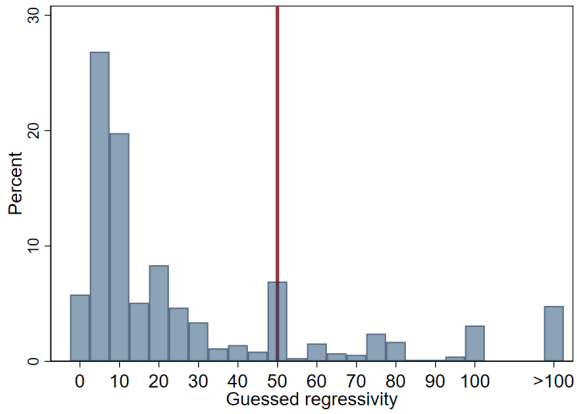
(a) Externalities



(b) Health cost misperceptions



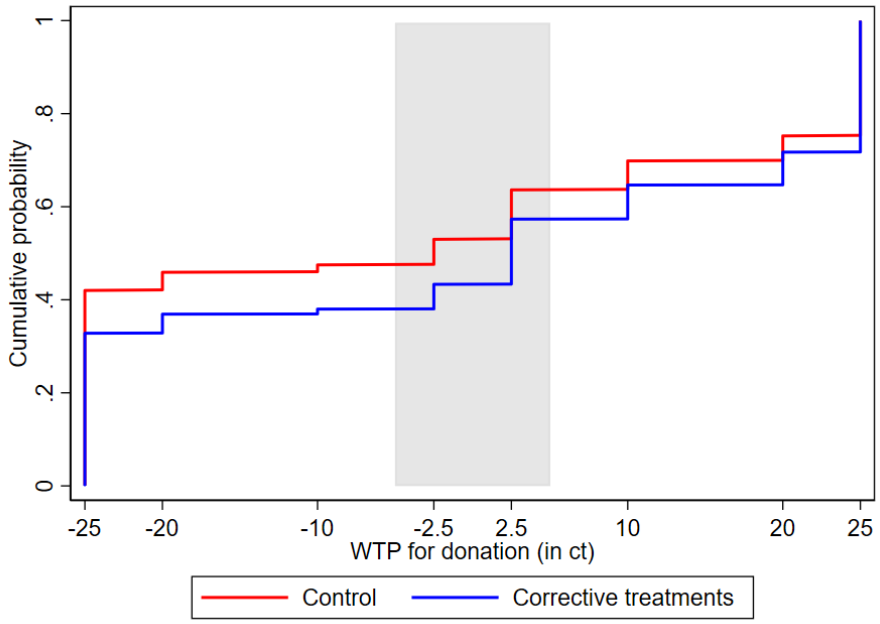
(c) Self-control



(d) Regressivity

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

Figure B.6: 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 B.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

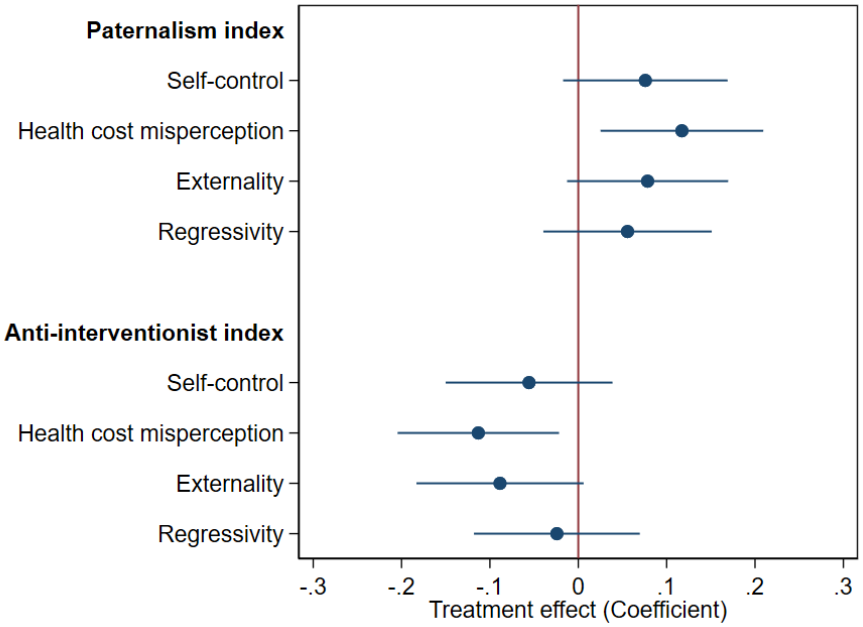
Notes: The table reports treatment effects based on OLS regressions (compared to the control). The dependent variable in Column (1) is the mean WTP for a 25ct donation to the CSPI. The dependent variables in Column (2) to (4) are indicator variables for a positive WTP, a WTP of -25ct, and a WTP of +25,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

Table B.6: Heterogenous 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 heterogenous treatment effects based on OLS regressions. Reference category are Democrats and respondents with income between 35k and 75k 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 B.7: 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.

C Willingness to pay for donation

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

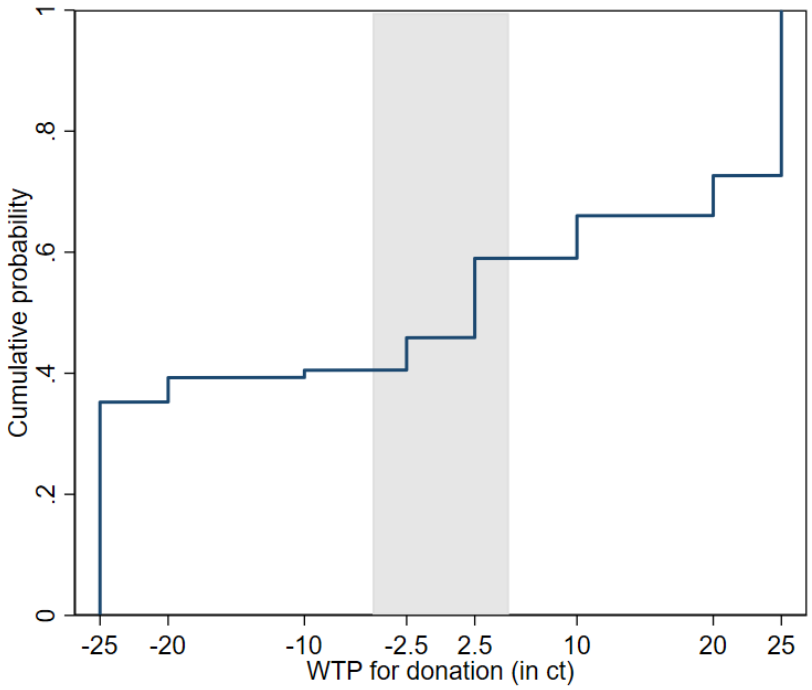
The survey requires subjects to make a decision in each row of the multiple price list. They decide on an allocation of (x_i, x_j), where x_i is a payout for herself, and x_j is a donation to the CSPI. Based on their switching point, their willingness to pay for a 25ct donation can be assigned to one of the intervals: [-∞,-25], [-25,-15], [-15,-5], [-5,0], [0,5], [5,15], [15,25], [25,∞]. 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 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 aversion to money). 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 C.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).

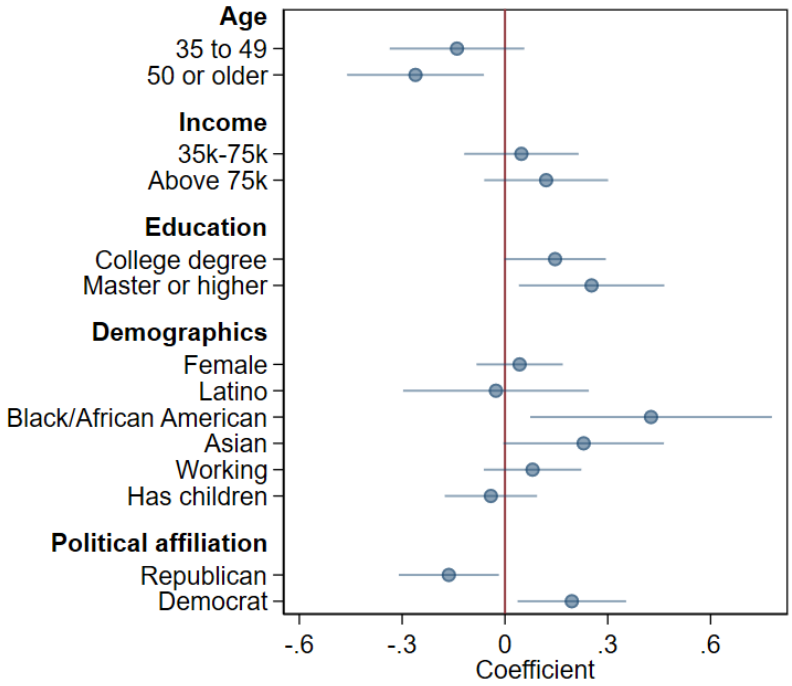
Figure C.1: CDF of donation WTP (all treatments)



Notes: Graph shows CDF of the WTP for a donation of 25ct to the CSPI. The shaded area illustrates the range, in which individuals are that have a WTP of zero.

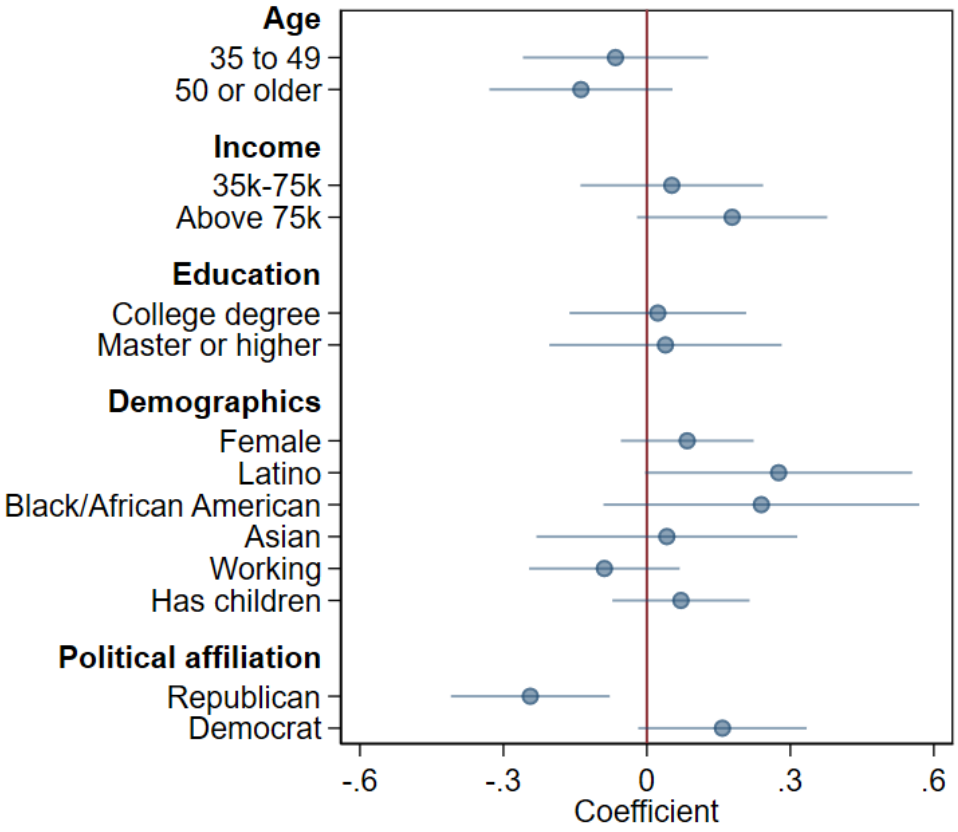
D Correlations of tax preferences with demographics

Figure D.1: Correlations with preference for federal tax



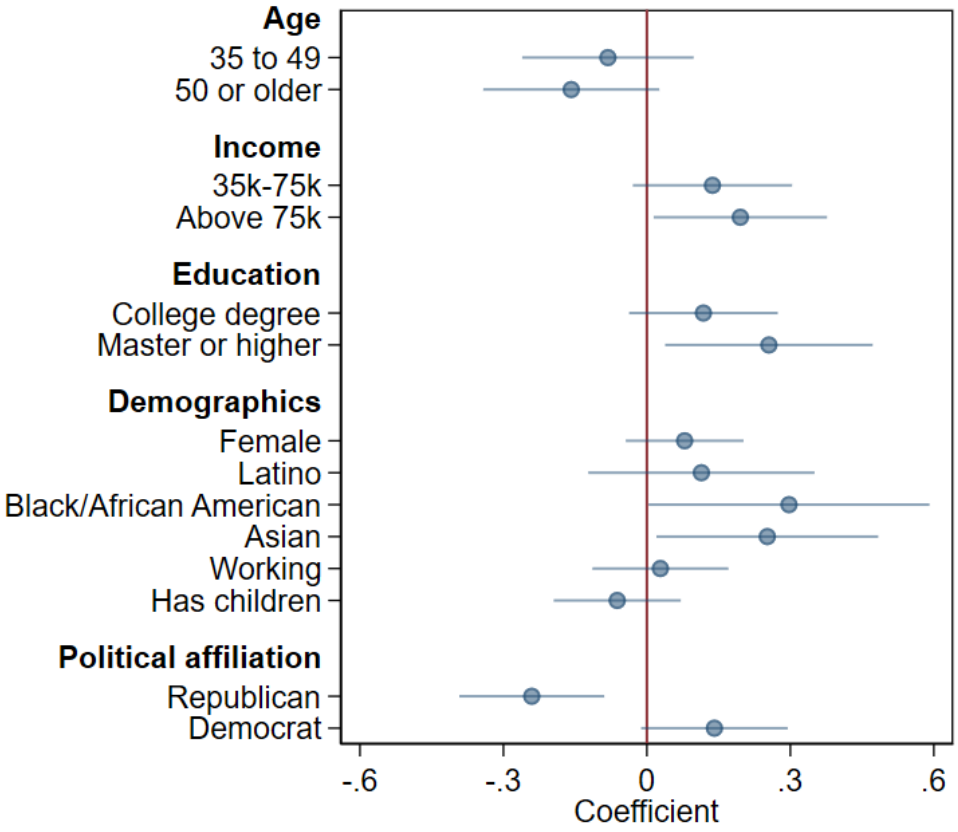
Notes: Graph shows coefficients and 95% confidence intervals from a OLS regression with z-transformed preference for a federal SSB tax (policy index) as dependent variable. Standard errors are robust. The omitted reference categories are younger than 35 (age), less than $35k (income), high-school or 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 estimations.

Figure D.2: Correlations with willingness to pay for donation



Notes: Graph shows coefficients and 95% confidence intervals from a regression with z-transformed WTP for donations as dependent variable. 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 estimations.

Figure D.3: Correlations with preference for tax in another state



Notes: Graph shows coefficients and 95% confidence intervals from a regression with z-transformed preference for a SSB tax in another state as dependent variable. 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 estimations.

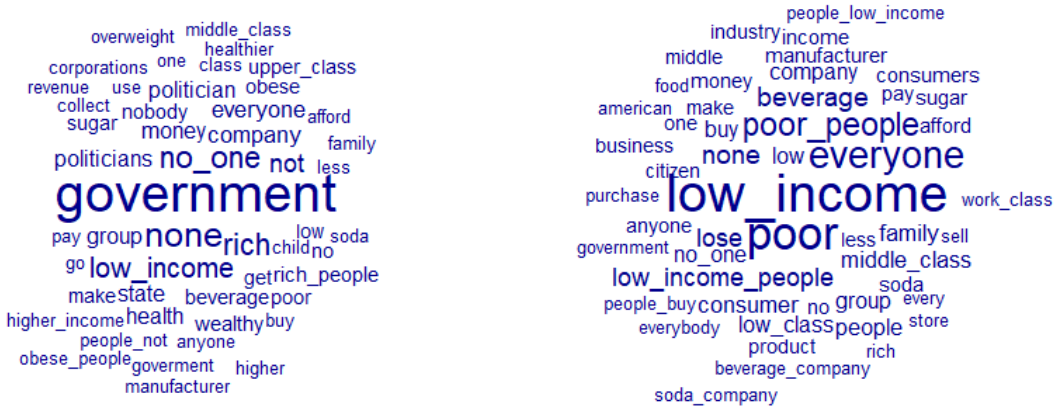
E Text analysis

Our analysis of the free text responses follows Ferrario and Stantcheva (forthcoming). 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 a SSB tax in Figures 2 and B.4, 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 a SSB tax in Figure E.4, we plot 1-grams since many respondents give 1-word responses. Also here, 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.

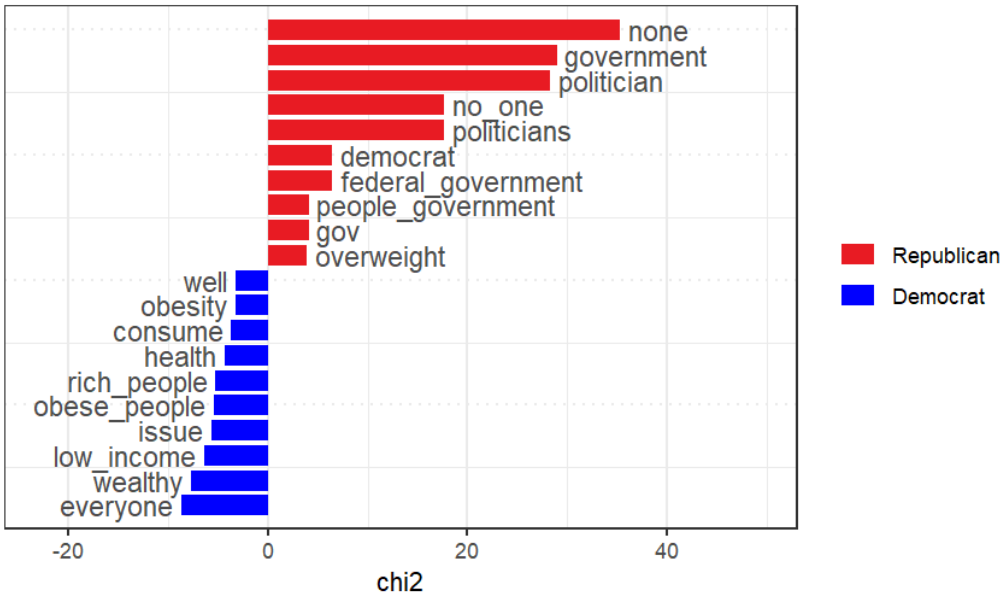
Figure E.4: Word clouds for winners and losers of a SSB tax



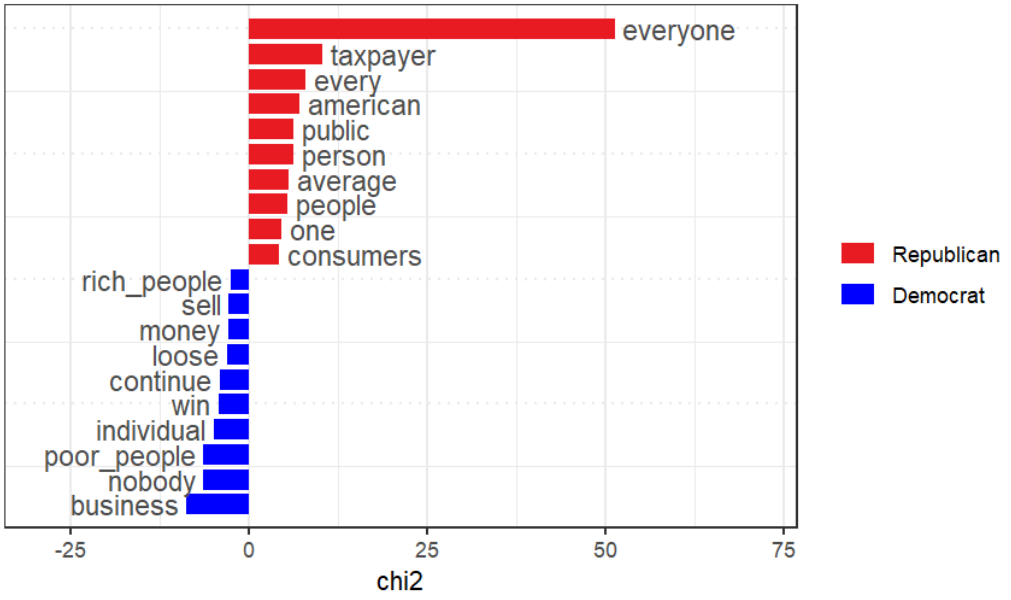
(a) Winners (b) Losers

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

Figure E.5: Keyness analyses for winners and losers of a SSB tax



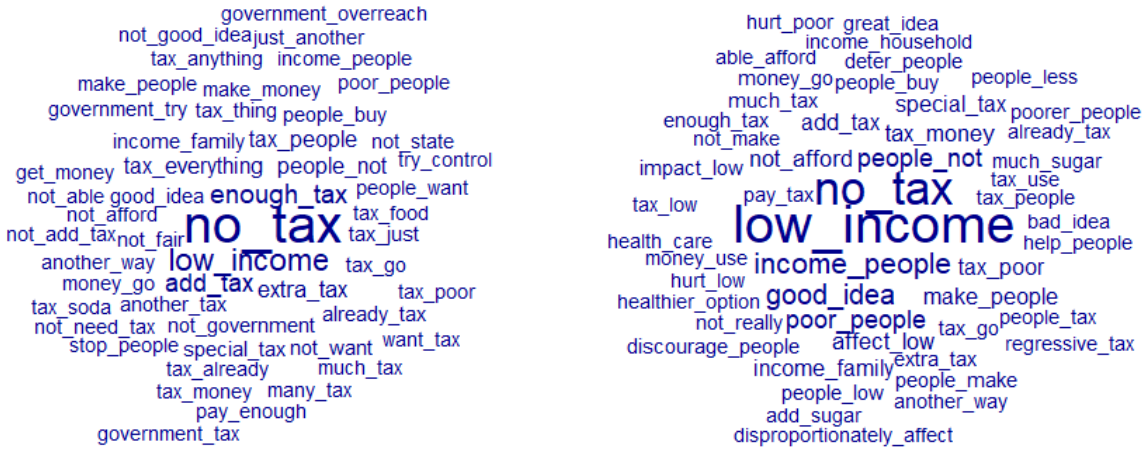
(a) Winners



(b) Losers

Notes: Graph shows word keyness graphs for potential winners and losers of a 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).

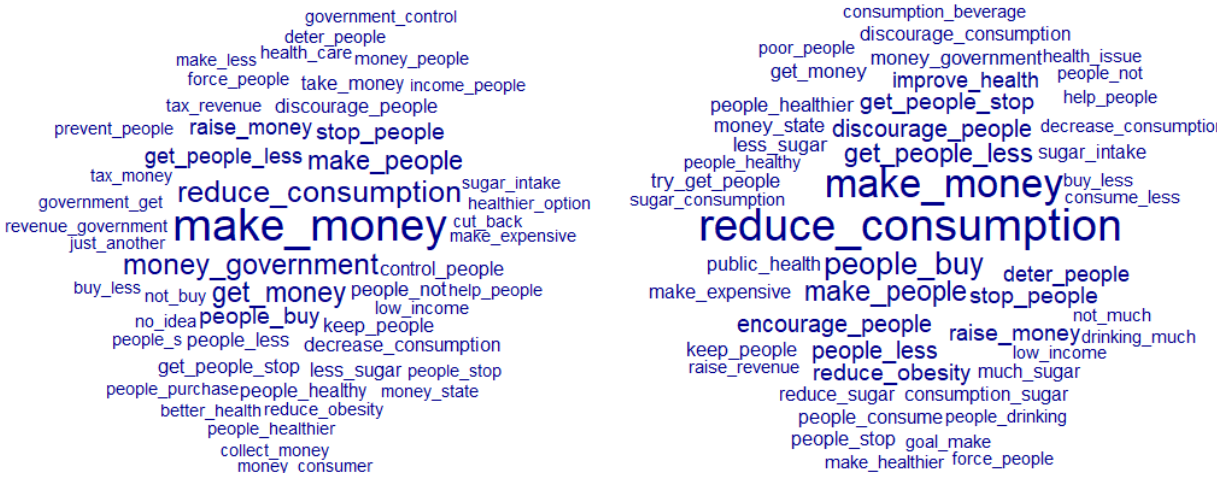
Figure E.6: Word clouds for considerations about SSB tax (by political affiliation)



(a) Republicans (b) Democrats

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

Figure E.7: Word clouds for goals of SSB tax (by political affiliation)



(a) Republicans (b) Democrats

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

F Instructions

F.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]

F.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.]

F.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]

F.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]

F.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? _____

F.6 Beliefs about 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]

F.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]

F.8 Information treatments

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

F.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]

F.10 Preferences over 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]

F.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]

F.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]