Compensatory Theory Drives Perceptions of Fairness in Taxation: Cross-Country Experimental Evidence

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Abstract

This paper uses a conjoint survey experiment fielded in the U.S., Australia, Chile and Argentina to develop and test the compensatory theory of tax fairness, which argues higher taxes on the rich can be used to compensate for other benefits unequally granted by the state. Drawing on social psychology, I argue that evidence of preferential treatment by the state violates well established distributive and procedural fairness principles, and show experimentally that it leads to the use of taxation as a means of restoring equality not only in crisis times, irrespective of wealth, and across a variety of settings. The paper makes three important contributions. It provides the first direct, causal and descriptive evidence of the importance of compensatory arguments for tax preferences. It presents unconfounded estimates of the effect of more established fairness considerations as benchmarks against which to compare the importance of compensatory arguments. And it provides cross-country evidence of the relevance of compensatory arguments across different cultures, tax regimes and levels of inequality, suggesting it represents a basic, shared expectation regarding the role of the state.

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Over the last 40 years the share of income earned by the top 1% in the U.S. has doubled from about 10 to 20%, while in the same period the share of the bottom 50% has shrunk from about 20 to 12%. Taxes on the other hand have become not more but less progressive: in 2018, for the first time in a century, the richest 400 Americans actually paid lower average tax rates than the working class (Saez and Zucman 2019). Similar, though less dramatic trends have been observed across the world (OECD 2011; Scheve and Stasavage 2021).

These outcomes seem puzzling in light of the predictions of a broad class of theoretical models linking growing inequality with increased redistribution via progressive taxation. Indeed, much effort has been devoted to explaining them. Institutional approaches have long argued democracy has been subverted, as policies fail to respond to mass preferences. This strand of research has studied issues of voter misinformation, manipulation or misrepresentation (Bartels 2005; 2008; Lupu and Warner 2021; Page and Jacobs 2009) in a political system captured by the interests of the rich (Gilens 2012; Gilens and Page 2014). In a context of growing inequality, these issues are certainly expected to gain relevance.

Yet survey evidence indicates citizens have to a large extent not reacted to rising inequality with increased demands for redistribution (Ballard-Rosa, Martin and Scheve 2017; Breznau and Hommerich 2019; Kuziemko et al. 2015). Moreover, even well-designed interventions increasing people's awareness of inequality and its negative consequences do not seem to lead to greater support for redistribution in general or progressive taxation in particular (Ballard-Rosa et al. 2021; Kuziemko et al. 2015). A disconnect between citizen preferences and government policies can therefore not be the full story.

Rather, it increasingly seems like the aforementioned theories' common assumption that individuals' redistributive preferences are solely (or even mainly) guided by self-interest is problematic. Behavioral perspectives have thus gained ground by underscoring the importance of other-regarding drivers of redistributive preferences, with an emphasis on fairness considerations (Dimick, Rueda and Stegmueller 2018). In fact, when it comes to tax preferences specifically, fairness views have been shown to be the most important factor shaping support for progressive taxes, at least in the U.S. (Stantcheva 2020). And

more generally, it is becoming more and more clear that what people care about is not inequality per se, but rather unfairness (Starmans, Sheskin and Bloom 2017). A better understanding of fairness principles, their interactions and cross-cultural validity thus becomes crucial to understanding these puzzling dynamics (Trump 2020).

That is precisely what this paper contributes. It furthers our understanding of fairness preferences by developing and testing the compensatory theory of tax fairness, claimed to have been responsible for the largest increases in tax progressivity in the 20th century (Scheve and Stasavage 2016). This theory argues that higher taxes on the rich are considered fair when they are used to compensate for other benefits unequally granted by the state. In line with it, prior work has shown that when the state is perceived as benefitting the rich in the context of massive assymetric shocks, progressive taxes have been successfully demanded as a way of restoring equal treatment (Limberg 2019; Scheve and Stasavage 2016). However, no direct, causal evidence that this fairness criterion is indeed applied by individuals when judging tax fairness has thus far been provided. In this paper, I draw on social psychology to argue that evidence of preferential treatment by the state violates well established distributive and procedural fairness principles, and show experimentally that it leads to the use of taxation as a means of restoring equality not only in times of crisis, irrespective of wealth, and across a variety of settings.

Yet the actual relevance of the compensatory fairness argument can only be ascertained in relation to other fairness arguments. These tell us publics in general consider taxes to be fair when they are distributed on the basis of two main criteria. The first is often described as ability to pay: in a world of decreasing marginal utility of income ensuring similar levels of sacrifice requires the rich to pay higher tax rates (Ballard-Rosa, Martin and Scheve 2017; Roosma, Van Oorschot and Gelissen 2016). The second is a matter of deservingness: if income is the result of varying levels of effort, those making greater effort deserve to keep more of their income through lower taxes (Alesina and Angeletos 2005; Durante, Putterman and Weele 2014). Determining the relevance of different fairness arguments in explaining individual tax preferences is a task riddled with confounding. Observationally, it is hard to disentangle between competing theories because trends in aggregate data can be consistent with many of them. People may

want the rich to pay higher tax rates because they have more money (ability to pay), or because they think they have made less effort (deservingness), or because they think they have been unfairly benefitted by the state (compensation), among other potential reasons. Even experimental approaches that focus on individual fairness theories are confounded by the assumptions respondents make about potentially correlated (i.e., income and effort) or underspecified (i.e., luck) attributes.

To deal with these issues I develop a conjoint experiment that randomly varies the level of income, source of income and share of income paid in sales taxes in paired profiles and asks respondents to pick which profile should pay a higher tax rate. Conjoint experiments are particularly suited to the task of identifying the relative importance of different fairness considerations as they have been shown to not just measure preferences but uncover the determinants of multidimensional decision making (Hainmueller, Hopkins and Yamamoto 2014). The experiment thus allows me to identify which fairness considerations people apply when deciding how to distribute the tax burden: ability to pay, deservingness or compensation. As such, this strategy allows me not only to test the compensatory theory but also compare its relative importance against unconfounded measures of alternative fairness considerations, and examine their interactions. To assess the generalizability of my findings I conduct comparable —and locally validated— versions of this survey in the U.S., Australia, Chile and Argentina, four countries with broadly different institutions, cultures, levels of inequality and of redistributive effort.

Results show that compensatory theory is grounded in our justice judgments, exerts a large influence on tax preferences and is widely used by mass publics across a variety of settings, suggesting it represents a basic, shared expectation regarding the role of the state. As such, the paper makes three important contributions. First, it tests for the first time the relevance of compensatory theory for individuals' tax judgments. Past research has highlighted its importance in elite rhetoric during critical historical junctures (Scheve and Stasavage 2016), but these results were subject to confounding and critically, never directly tested at the individual level. Second, it draws on justice judgment theory to provide the psychological foundation for compensatory theory. This theory explains why compensatory arguments can be a powerful driver of fairness preferences and offers

testable empirical implications. Third, it assesses the importance of compensatory theory relative to other, more established, fairness arguments.

This paper's findings can offer insight into current, and perhaps unexpected, dynamics. In recent years, demands for taxing the rich have suddenly —and conspicuously— gained ground in the context of the Covid-19 pandemic.[1] By bringing to the fore an unequal and unfair distribution of burdens, as well as the critical role played by the state in it, the pandemic seems to have set the stage for growing compensatory demands.

The paper is organized as follows. Section I develops the compensatory theory of tax fairness against the backdrop of other well-established fairness arguments. Section II describes the conjoint survey experiment. Section III discusses case selection and data sources. Section IV presents the results of the conjoint surveys in the U.S., Australia, Chile and Argentina. Section V discusses key scope conditions and section VI concludes.

1 A Compensatory Theory of Tax Fairness

The idea that higher taxes on the rich might be justified as a way of compensating for other benefits unequally granted by the state is not new. The compensatory theory of progressive taxation was first documented by Edwin Seligman in 1893, who used the term to describe an extant argument in favor of tax progressivity: "where differences in wealth may fairly be presumed to be in a measure due to the state's own acts of omission and commission, allowance should be made therefor in the tax system" (Seligman 1893, p. 223). Seligman discarded this defence of progressive taxation as impracticable[2].

[1] See for example The Washington Post, "Should the rich pay for the pandemic? Argentina thinks so, other countries are taking a look", February 19th 2021, https://www.washingtonpost.com/world/the_americas/coronarvirus-argentina-wealth-tax/2021/02/19/96fd1ec4-711b-11eb-93be-c10813e358a2_story.html (accessed March 14th 2021), and BBC, "Tax the wealthy to pay for the coronavirus", December 9th 2020, https://www.bbc.com/news/business-55236851 (accessed March 14th 2021) or The Guardian "The pandemic is helping the rich get even richer. It's time to tax their obscene wealth", August 11th 2020, https://www.theguardian.com/commentisfree/2020/aug/11/the-pandemic-is-helping-the-rich-get-even-richer-its-time-to-tax-their-obscene-wealth (accessed March 14th 2021).

[2] "The defect of the theory consists in the fact (...) that it furnishes no practical standard and enables us to lay down no general principles by which the influence of the state in creating inequalities of

However, he did acknowledge that a more restricted version of this argument, which he called the special compensatory theory, was more compelling. This theory focuses exclusively on state interventions via the tax system to argue that a progressive tax can be justified as a way of compensating for the regressive incidence of a different tax: "When indirect taxes exist they often, it is said, hit the poor harder than the rich. The income tax, with its progressive scale, is to act as an engine of reparation. In order to attain equal treatment, the regressive indirect taxes must be counterbalanced by the progressive direct taxes" (Seligman 1893, p.224). The historical record shows that this type of compensatory argument in favor of progressive direct taxation was used repeatedly since as early as the 14th century (Scheve and Stasavage 2016).

The above excerpts bring to the fore key elements of the compensatory theory that are worth highlighting. First, the goal of compensatory fairness demands is to achieve —or rather, restore— equal treatment by the state. Consequently, compensatory fairness refers to benefits unequally granted *by the state*. The market generally provides unequal benefits, yet this does not trigger demands for compensation as such.[3] It is the fact that unequal benefits come from the state that makes them distinctly unfair. Third, compensatory fairness refers to benefits *unequally* granted by the state. It is thus not about absolute but rather relative benefits (i.e., what is problematic is not that someone gets something, but rather that someone gets something and others do not), as this is what violates the expectation of equal treatment. Fourth, the benefits provided by the state can take different forms including, but not limited to, tax benefits. Moreover, we can think of at least two distinct types of benefits: those granted by commission (or positive benefits) and those granted by omission (or negative benefits). The former occur when a particular group is privileged by some government intervention while others are not, while in the latter the state may ask some to sacrifice while a particular group does not bear the same burden.

The compensatory theory is perhaps most closely related to what Seligman (1893)

misfortune may be measured. (...) the test embodied in the present doctrine is impracticable." (Seligman 1893, p. 223).

[3]It does trigger demands for redistribution but these are not generally made on the grounds of compensation, but rather of equality of sacrifice or equality of opportunity arguments.

calls the theory of benefits, recently developed as classical benefit-based taxation by Weinzierl (2018). According to benefit-based taxation, individual tax liabilities should correspond to how much an individual benefits from the activities of the state. In that sense, it is similar to compensatory theory. However, it is also distinct in that it is a general theory of how an *overall* tax system should be structured based on who receives what in terms of public goods.[4] There are thus crucial differences both in what is being compensated and how. While the benefit theory focuses on public goods provision as the determinant of individual benefits, compensatory theory is broader in the sense that it seeks to compensate for any "acts of omission and comission" (Seligman 1893, p. 223) with unequal distributional implications.[5] Moreover, the benefit theory channels compensation through the overall design of the tax system (engaging with optimal tax theory), while compensatory theory is narrower in the sense that it argues that an individual policy change —i.e., with respect to a specific tax— can be justified on compensatory grounds.

In recent work, Scheve and Stasavage review the fairness arguments that have historically been used to justify tax progressivity and highlight the political power of compensatory arguments (2016). They argue that in the context of mass mobilization wars during the 20th century, compensatory arguments were responsible for the adoption of the highest levels of tax progressivity in modern history. In both cases, the claim was that while the poor were giving their lives for their country, the rich were not sacrificing to the same extent, and some were even benefitting from the war industry (Scheve and Stasavage 2010; 2012). Steeply progressive direct taxes were thus presented as a way of compensating for non-tax privileges granted by the state to the rich. As a result, World War I led to an increase in top marginal income tax rates in participating countries from under 10% to over 50%, and World War II pushed them even further, to above 90% in some countries (Scheve and Stasavage 2016).

Limberg (2019) builds upon this work to argue that not just mass mobilization wars

[4]Indeed, Seligman discusses both as clearly distinct arguments in his work on progressive taxation (1893), classifying the theory of benefits under the category of general theories of taxation along with the theory of ability.

[5]A clear example of this (discussed below) is wartime conscription, which is clearly not a benefit but affects different age/income groups unequally.

but other kinds of massive assymetric shocks have also led to increases in tax progressivity through compensatory fairness concerns. He claims this was the case with the 2008 financial crisis, during which low-income households bore the brunt of the recession while the rich benefitted from both positive and negative state privileges.[6]

These prior works show compensatory fairness arguments are correlated with increases in tax progressivity at the macro level, but say nothing about the mechanism linking the two. Indeed, the effectiveness of compensatory arguments could be driven by institutions or other features of the political arena. In fact, hikes in top marginal income tax rates during crises could potentially even result from ability to pay concerns, as inequality increases, or deservingness ones, if the rich are seen as profiteering from the crisis.[7] My contribution is to propose, and test, the psychological micro-foundations linking compensatory arguments with increased demands for tax progressivity at the individual level. In so doing I provide the key missing mechanism in the above-mentioned studies and demonstrate the need to incorporate compensatory arguments into the study of tax fairness more broadly.

To explain why compensatory arguments can be compelling at an individual level I draw on justice judgment theory, a psychological framework used to study perceived fairness in social relationships (Leventhal 1980). While traditionally restricted to the branch of organizational justice research, its application to citizen-state relations is not unprecedented (Tyler 1984). This theory proposes a multidimensional conception of justice, arguing that fairness perceptions are based on several justice rules, with different relative weights according to their contextual importance. It outlines two broad categories of justice rules: distributive and procedural ones. Distributive justice rules dictate that fairness exists when rewards, punishments or resources are distributed on the basis of either contributions, needs or equality. Procedural rules on the other hand dictate

[6]The increase in top marginal income tax rates in this case was however estimated to be much smaller than that documented by Scheve and Stasavage in war contexts: 4% on average in the medium run.

[7]Regarding Limberg's work, other research also questions the role played by compensatory fairness demands, suggesting changes in preferences for progressivity in the wake of the Great Recession may be driven by self-interest as they are highly responsive to variations in personal circumstances (Garcia-Muniesa 2019).

that allocative procedures are fair when they satisfy certain criteria, including consistency, bias-suppression, accuracy, correctability, representativeness and ethicality. The relevance of any given criterion or rule depends on the specific circumstances, and when it comes to the political arena the procedural rule of consistency, or treating everyone equally, has unsurprisingly been found to be of particular importance (Tyler 1984).

Whenever the state arbitrarily benefits particular groups, both categories of fairness rules are simultaneously violated. In terms of procedural fairness, the consistency rule, which indicates "it is necessary to apply similar procedures to potential recipients of reward, and to give special advantage to none" (Leventhal 1980, p. 40) is evidently broken. In terms of distributive fairness, any unjustified benefit will break the equality and the contributions —or effort— rules. Benefitting the rich will add to this the blatant violation of the needs rule. Compensatory demands can thus be understood as an attempt to restore justice in the form of equal treatment by the state in reaction to the violation of these deeply rooted fairness norms.

This approach to compensatory theory indicates it may be more general than has heretofore been considered. Firstly, it suggests that while it has gained notoriety for its role in promoting progressive taxation, there is nothing inherently progressive about it. What is essential is that an undeserved benefit is given to a particular group, violating expectations that the state should treat everyone equally and rewards should be fairly distributed. Inasmuch as states can benefit other clearly identifiable social groups in an obvious and significant manner, compensatory arguments could be used to justify placing a higher burden on any group.[8] This is not to say wealth is irrelevant, only that it is not necessary. Indeed, wealth can be important in two ways. On the one hand, it can enhance the perception of unfairness by adding the violation of the needs rule of distributive fairness. On the other, it plays an important political role: it is likely easier to identify and mobilize against unfair advantages granted to the rich than to other groups. Moreover, when benefits are targeted at the rich, compensatory arguments can add to ability to pay arguments to crucially enlarge the base of support for progressive taxation.

[8]Moreover, there is no reason why that burden should take the particular form of a monetary tax rather than say corvée labor or military service.

Secondly, while compensatory arguments have ostensibly been most successful in the context of mass mobilization wars (or massive asymmetric shocks more generally), this is also not necessary. The importance of these types of crises most likely lies in providing the conditions under which unequal burden sharing will be most salient. As in the case of wealth, crises, while not necessary for compensatory demands to arise, are likely to facilitate political mobilization.

Justice judgment theory thus provides three key empirical implications regarding the functioning of compensatory tax fairness: compensatory demands must arise i) independent of the existence of a crisis situation and ii) independent of recipients' wealth, but iii) will be increasing in recipient wealth. All three of them will be tested in the experiment presented below.[9]

1.1 Other Drivers of Fairness Preferences in Taxation

The relevance of compensatory theory as a driver of tax fairness preferences depends not only on whether people care about compensating for unfair advantages bestowed by the state, but also on how much they care about it. Existing research on tax fairness has thus far studied fairness ideals one at a time, providing no insight on the relative importance of and potential interactions between different conceptions of fairness.[10] Yet justice judgment theory tells us fairness perceptions can be based on several justice rules, not just one, and a person's final fairness judgment will be a weighted combination of the different applicable rules. This paper therefore studies compensatory arguments along

[9]Another potential implication that is difficult to manipulate experimentally and not tested here is that compensatory demands will be stronger in the context of a crisis or massive asymmetric shock.

[10]One noteworthy exception is the work by Lefgren, Sims and Stoddard (2016), which varies both reward (high vs low) and effort (high vs low). However, their work examines peoples' preferences for rewarding effort (by focusing on the interaction between the level of effort and reward), rather than disentangling the effect of each. Moreover, taxes are fully redistributive in their setting and participants are parties to this redistribution, raising additional concerns regarding their relative performance within the group. Weinzierl (2017) asks participants in an allocation game to explain why they chose a progressive distribution of costs: ability to pay or what he calls classical benefit-based taxation. While indicative that ability to pay is not as prevalent as generally assumed, this component is not experimental and the latter is not clearly distinct from deservingness.

with other components of tax fairness in an attempt to obtain a more comprehensive understanding of their relative importance. In particular, I will consider the influence of ability to pay and deservingness, arguably the two most studied drivers of tax fairness. Additionally, I will also explore equal treatment preferences as a potential alternative explanation.

Ability to pay. Since the development of the workhorse model of optimal tax theory in the 1970s (Mirrlees 1971), most normative and positive models of taxation have assumed fairness concerns are sufficiently captured by ability to pay principles as a way of either maximizing aggregate social welfare or achieving equal sacrifice (Ok 1995; Young 1988). The ability to pay principle essentially argues that when it comes to paying taxes everyone should make the same level of sacrifice, which given the basic fact of the decreasing marginal utility of income means the rich should pay a higher tax rate. In the justice judgment framework, ability to pay is an example of the distributive fairness equality rule, which indicates not just rewards but also sacrifices should be allocated equally. Empirical research has convincingly showed that on average the American public's tax preferences are progressive, a finding that has been interpreted as evidence of the prevalence of ability to pay principles (Ballard-Rosa, Martin and Scheve 2017; Roosma, Van Oorschot and Gelissen 2016).[11]

Deservingness. More recently, researchers have started to conceptualize fairness also as deservingness.[12] Deservingness refers to the notion that depending on how income (or

[11]However, unless respondents' beliefs regarding the source of wealth are controlled for, preferences could potentially be confounded by other fairness beliefs. For example, Gee, Migueis and Parsa (2017) argue that, at least in a lab setting, respondents use observed income as a signal of unobserved deservingness.

[12]An additional potential driver of tax fairness, not considered here, is inequality aversion. Inequality aversion is expressed in the fact that for some individuals a more equitable allocation of outcomes in society increases their utility, making them willing to give up some material payoff to move in this direction (Alesina, Cozzi and Mantovan 2012; Fehr and Schmidt 1999; 2006). Inequality aversion may thus have similar implications as ability to pay (progressive taxes) but its motivation is different: not equalizing sacrifice but directly equalizing outcomes. However, its status as a distinct fairness concern is unclear. Recent psychological research argues that what has been taken as evidence of inequality aversion is actually aversion to unfairness (Starmans, Sheskin and Bloom 2017). Moreover, inequality aversion is often found to be grounded on ideas of deservingness, in the sense that people who think

wealth) is produced, some people are more deserving of their income than others and should therefore be entitled to retain a higher share of it through lower taxes. Deservingness principles are thus an example of the contributions criterion of distributive fairness, also known as the merit principle (or meritocratic fairness views (Almås, Cappelen and Tungodden 2020)).

In the economics and political science literature, deservingness has been operationalized in two distinct ways. On the one hand, formal and observational studies have focused on the role of abstract beliefs about how income is produced to show that people who believe that income is the result of effort prefer lower taxes than those who believe it is the result of luck. These beliefs have most notably been used to explain differences regarding the preferred level of taxation in the U.S. and Europe (Alesina and Glaeser 2004; Alesina and Angeletos 2005; Piketty 1995). On the other hand, experimental studies have manipulated the source of income to show that subjects prefer higher taxes when income results from luck than when it results from effort (Chow and Galak 2012; Durante, Putterman and Weele 2014; Fong and Luttmer 2011; Lefgren, Sims and Stoddard 2016). Durante, Putterman and Weele (2014) expand upon this distinction to include income resulting from initial conditions or opportunity, and find that it results in intermediate levels of taxation. To the extent that compensatory demands are based on the perception that a special privilege granted by the state was not warranted or deserved, we can think of compensatory theory as a special —additional— component of deservingness.

Equal Treatment. In a recent contribution, Scheve and Stasavage (2021) show that some people believe that just as everyone in a democracy should have the same vote, tax fairness requires everyone to pay the same tax rate. They use this fact to explain the inelasticity of tax policies to growing inequality: equal treatment supporters reduce the progressivity of average tax preferences, making them less sensitive to changes in inequality than they would otherwise be.

Compensatory arguments can be thought of as the flip side of equal treatment: people

income results from luck are more inequity averse than those who think it results from effort (Esarey, Salmon and Barrilleaux 2012). Recent experimental evidence suggests people do not care about general levels of inequality but rather about the fairness of their own outcomes relative to others (Lü and Scheve 2016).

prefer the state treated everyone equally, but when equal treatment is violated compensatory demands arise in an attempt to restore equality. But is it the case, then, that compensatory demands are driven by respondents who adhere to equal treatment? Justice judgment theory provides another empirical implication here: compensatory demands should not be limited to people adhering to equal treatment as exclusive state benefits trigger not only procedural concerns about equal treatment violations, but also distributive ones about deservingness violations. This is precisely what the analysis below shows.

2 Experimental Design

As mentioned above, the goal of the experiment presented here is to test whether compensatory fairness arguments matter for people's tax preferences and to do so in a way that informs us of their relative importance with respect to more established fairness considerations. Moreover, I want to test the two different versions of compensatory theory described above: general and special compensatory theories. In addition, I hope to minimize self serving bias to ensure people are not using fairness concerns to justify preferences that simply benefit them.

To achieve these goals I take advantage of conjoint experiments' known capacity to measure preferences and uncover the determinants of multidimensional decision-making (see for example Ballard-Rosa, Martin and Scheve (2017); Bansak, Hainmueller and Hangartner (2016); Hainmueller and Hopkins (2015)). Conjoint survey experiments "ask respondents to choose from or rate hypothetical profiles that combine multiple attributes, enabling researchers to estimate the relative influence of each attribute value on the resulting choice or rating" (Hainmueller, Hopkins and Yamamoto 2014, 2). Conjoints are particularly suited to the task at hand because they not only capture the direction of respondents' preferences, but also their intensity (Abramson, Koçak and Magazinnik 2019).[13] As such, we can think of conjoint estimates as representing the weights assigned to different fairness rules for a particular task, as depicted by justice judgment theory. In

[13]While there is some debate regarding the value of this feature when it comes to studying electoral behavior (see Abramson, Koçak and Magazinnik (2019) and Bansak et al. (2020)), its value when it comes to understanding the drivers of policy preferences is undeniable.

this case, respondents were presented with pairs of profiles in which income level, source of income, and percentage of income paid in sales taxes were randomly varied, and asked to choose which of the profiles should pay a higher tax rate. Given that distributive fairness judgments are always relative rather than absolute (Tyler 1984), this approach is expected to be intuitively appealing to respondents.

This design allows me to identify which individual attributes people take into consideration when deciding how to distribute the tax burden, as a way of getting at which fairness considerations they are applying. The main intuition, summarized in table 1, is that if people apply ability to pay considerations (i.e., they think richer people should pay more taxes) they should choose on the basis of level of income; if they apply deservingness considerations (i.e., they think people who did not exert effort should pay more) they should choose on the basis of source of income; and if they apply compensatory considerations (i.e., they think people who have benefitted from the state should pay more) they should choose on the basis of whether the source of income resulted from state benefit (general compensation: for any state action) and/or the percentage of income paid in sales taxes (special compensation: for another tax). It is not immediately clear whether both general and special compensation will matter as it may be the case that, as predicted by Seligman, people are more inclined to compensate for one tax using another, than to use taxes to compensate for the effects of other kinds of state policies or actions (1893). As mentioned above, table 1 locates compensatory theory as an additional instance of the broader deservingness debate.

An important feature of conjoint experiments that is worth noting, is that the sign and magnitude of any effects depends on the specific set of attributes included (Abramson, Koçak and Magazinnik 2019). Attribute selection is thus fundamental. Here, I was guided by the existing literature on tax fairness, and included those fairness concerns that have been most studied and therefore represent meaningful benchmarks. Moreover, qualitative research on tax beliefs in the U.S. has also found that attitudes towards progressivity are shaped by concerns regarding civic equality given conditions of economic inequality (or ability to pay), the role of hard work and not wanting to punish hard workers (or deservingness), and for a small number of interviewees, also the benefits wealthy people

have received from the society they live in (or something suggestive of compensation) (Williamson 2017).

Table 1: Attributes, Attribute Levels and Fairness Tests

Attribute	**Attribute Levels**	**Fairness Argument**
Annual income	<low (∼40th percentile)>	Ability to pay
	<medium (∼80th percentile)>	
	<high (∼95th percentile)>	
Source of income	<effort>	Deservingness
	<luck>	
	<social background>	
	<state benefit>	General compensation
% of income paid in sales taxes	<low>	Special compensation
	<medium>	
	<high>	

Note: Actual attribute levels vary by country. See table A.1 in the SI for the full list.

This conjoint design offers several advantages. First, estimates for all attributes represent effects on the same outcome (the probability that a profile will be chosen to receive the higher tax rate), which means they can be compared in order to assess the relative influence of different attributes (and ultimately, fairness considerations). Second, the fact that attributes vary randomly allows me to identify the independent effects of correlated attributes. In fact, as a result of studying conceptions of fairness individually, existing estimates are often biased by the confounding of level and source of income, as people infer the latter from the former (i.e., people tend to assume that the rich earned their wealth through effort (Weiner and Kukla 1970)). Third, the forced choice component —as opposed to asking respondents to directly assign a tax rate to each profile—, neutralizes attitudes about the overall level of taxation and identifies the attributes that make citizens appear as more or less taxable to the respondent. This allows me to disentangle preferences regarding the size of taxation from the distributive issues linked to its shape (Barnes 2015). Fourth, leaving the intended use of the revenue collected unspecified means I can focus on respondents' tax policy preferences, as distinct from preferences for spending or social insurance (Cavaillé and Trump 2015). Fifth, I can assess the ex-

istence of heterogeneity in preferences by respondent characteristics, and the extent to which attributes interact with each other. In this regard, it is especially interesting to examine whether compensatory arguments come into play regardless of level of income in the profile or respondent adherence to equal treatment. Finally, the absence of material stakes in conjoint designs helps to minimize the presence of self-serving bias.

In terms of the attribute levels used, annual incomes are chosen to represent low, middle and high income levels (around the 40th, 80th and 95th percentiles of the income distribution, respectively).[14] Sources of income were chosen through formative studies run on independent samples in each country with the purpose of identifying sources of income that would be interpreted in the way intended (as resulting from effort, luck, social background and state benefit), and were relatively orthogonal to one another and to the level of income.[15] Shares of income paid in sales taxes were chosen so as to approximate the actual shares of income paid by families at different points in each country's income distribution.[16]

Interpretation of the source of income attribute warrants clarification. Sources of income were chosen so as to represent the components of deservingness considered in past research (effort, luck, social background), as well as state benefit. The rationale behind them is not that individual income taxes should vary with the source of income, but to show that people's tax preferences are guided by deservingness considerations linked to

[14]To see the complete U.S. version of the survey go to `https://nyu.qualtrics.com/jfe/preview/SV_ehfLU3JUO4VDDaR?Q_CHL=preview`. The survey was programmed in Qualtrics using the "Conjoint Survey Design Tool" made available by Strezhnev et al. (2013).

[15]See supplemental information (SI) section 2 for details on the formative study. Notably, and likely due to cultural reasons, ensuring sources of income were interpreted in the same way across countries (e.g., as resulting from effort or a state benefit) in some instances required using different sources of income in the different country surveys.

[16]For the U.S., the Institute on Taxation and Economic Policy shows that on average across all states, families in the lowest 20% in the income distribution pay 7% of their family income on sales and excise taxes, while families in the top 1% only pay 0.9%. Moreover, in some states the share paid by low-income families is as high as 13.3% (Washington) and the share paid by top income families is as low as 0.1% (Montana) (Wiehe et al. 2018). Percentages were adjusted upward in Chile and Argentina to account for the fact that their VAT rates (19 and 21% respectively) are much higher than in Australia (10%) or the U.S.

the source of income. Their practical implication can be found in substantiating special rates on lottery winnings, inheritance, or war profits taxes, and presumably also wealth taxes if the rich —as a class— are perceived as having been unfairly benefitted by the state.

The share of income paid in sales taxes attribute directly tests what Seligman called the special compensatory theory, which called for the use of progressive direct taxes to compensate for regressive indirect ones. While sales taxes are indeed regressive, whether respondents are aware of this or not is insubstantial. The point of this attribute is to assess whether respondents react to the violation of equal treatment represented by the fact that the sales tax burden, which every consumer is subject to, is unevenly distributed. If, as evidence suggests, people are unaware of sales taxes and their regressive incidence (Williamson 2017), then we can interpret effects of this attribute as representing demands for compensation regardless of wealth or level of income.

Analogously, having a source of income resulting from a state benefit is included as a test of the general compensatory theory, which claims that taxes can be used to compensate for other non-tax benefits unequally granted by the state. In line with the discussion above, the state benefit sources of income that are used —owning a business that was bailed out by government, and owning a company that receives government subsidies— are ones that are not exclusively enjoyed by the rich.[17] I thus test whether people apply compensatory arguments —whether they want to use taxes to compensate for a state benefit—, even when the benefitted are not rich, as suggested by justice judgment theory.

These tests of the special and general compensatory theory can be thought of as representing the different triggers for compensatory demands for taxing the rich that are present in peace and crisis times. Indeed, Scheve and Stasavage argue that during peacetimes compensatory arguments can build on the benefit granted to the rich by

[17]A potential concern here is that as a result of the 2008 financial crisis respondents may be biased into thinking the attribute used in the U.S. and Australia (owning a business that was bailed out by government) is targeted at the rich. Even if this were the case, the level of income attribute is expected to correct this assumption. Moreover, evidence from Chile and Argentina shows that results are robust to using other types of state benefit.

virtue of a lower consumption tax burden (2016). In times of crisis —be it mass wars, financial crises, pandemics or other types of massive asymmetric shocks—, compensatory arguments can highlight clear and manifest non-tax benefits granted exclusively to the rich. History suggests we should expect compensatory arguments to be more effective in this latter case. Since the state benefit source of income is not associated to a crisis in the experiment though, any effects are likely a lower bound of what could be expected in such a context.

In terms of presentation, two profiles were presented side-by-side on the same screen, with the following prelude (examples are taken from the U.S. survey, others are equivalent):

> Many observers in the United States have discussed the possibility of changing the federal income tax code to address multiple issues. The design of a new tax system raises a number of questions, including whether and why some people should pay higher rates than others. We are interested in what you think about this.
>
> We will show you profiles of random individuals. You will be shown pairs of individuals, along with several of their attributes. For each comparison we would like to know which of the two individuals you think should pay a higher tax rate. In total, we will show you five comparison pairs.
>
> Bear in mind that when we talk about tax rates we mean the percentage of their income that someone pays in taxes. People with different incomes who pay the same rate actually pay different amounts (i.e., 30% of an income of $100,000 is $30,000, but of an income of $50,000 it is $15,000).
>
> Please take your time when reading the attributes of each individual. People have different opinions about this issue, and there are no right or wrong answers.

This introduction was followed by a screen similar to figure 1.

Figure 1: Example of Choice-Based Conjoint Survey

Attributes	Individual 1	Individual 2
Percentage of income paid in sales taxes	10%	1%
Source of income	Receives annuity from lottery prize	Owns business that was bailed out by government
Annual income	$40,000	$160,000

Which of the two individuals would you personally prefer to charge a higher tax rate to?

Individual 1 | Individual 2

In order to maximize the number of observations and allow respondents to familiarize themselves with the format of the experiment, each subject saw 5 pairs of profiles.[18] After the first pair of profiles, they were asked to justify their choice in an open ended question. In addition to completing their 5 choice tasks, respondents were asked to fill a survey asking for their socio-demographic information (age, gender, education, household income, partisanship, employment status, race, marital status, ideology and zip code of residence). They were also asked to answer a question regarding their general preferences for progressivity, used to measure adherence to equal treatment:[19]

> Do you think everyone should pay the same share of their income in taxes or some people should pay a higher share than others?

[18] Attribute order was randomized across respondents.

[19] The survey also included an attention screener. All results are robust to dropping inattentive respondents.

3 Case Selection and Data

Existing experimental research on fairness preferences has to a large extent been conducted in the U.S. and Europe.[20] In an effort to expand the scope of comparative research on tax fairness to a new region, and increase the extent to which findings can generalize, I conduct my survey in four different countries: the U.S., Australia, Chile and Argentina. This case selection covers a great deal of variation in both market inequality and redistributive effort, two variables that could potentially be associated with redistributive preferences at the country level.[21] Moreover, including Latin American countries is of particular interest because despite the singularity of their tax regimes we still know relatively little about tax preferences, in particular in terms of fairness, among their publics.[22] Nonetheless, to ensure comparability with U.S. and Australian results, and given the online nature of the experiment, two Latin American countries with internet penetration rates at least as high as the U.S. were selected.[23]

The U.S. survey was conducted in October 2017 on an online sample of 2,000 U.S. residents on Amazon's Mechanical Turk (MTurk).[24] Evidence that results from convenience samples such as MTurk replicate in national probability samples is by now compelling (Berinsky, Huber and Lenz 2012; Coppock 2019). Nonetheless, given that my MTurk sample is considerably younger, better educated and more liberal than the population (see SI section 3 for a comparison), I show in the SI that results do not significantly vary when using entropy balancing weights to adjust the sample so that it matches the demographic and geographic margins of the adult population. To avoid paying the variance

[20]Notable exceptions are Jakiela (2015) and Cappelen et al. (2013), which conduct experiments in European and African countries, and Heinrich's lab experiments in the Peruvian Amazon (2000).

[21]See SI figure A.1 for the relative levels of inequality and absolute redistribution in countries in the sample according to SWIID data (Solt 2020).

[22]Latin America is the region with the lowest revenues from direct taxes in the world (Kacef, Weller and Jimenez 2011). Taxation is thus highly regressive, and even compared to other countries at their level of development, most Latin American countries are under taxed (Huber and Stephens 2012).

[23]According to the International Telecommunication Union, the percentage of individuals using internet in the US, Australia, Chile and Argentina in 2017 was 75, 86, 82 and 76% respectively.

[24]The design was preregistered in the Political Science Registered Studies Dataverse (doi:10.7910/DVN/QKYQF5). All experiments received approval from NYU's Internal Review Board.

penalty incurred by weighting though, I present unweighted estimates throughout.

Surveys in Australia, Chile and Argentina were conducted in early February 2020 (pre-Covid 19) on online samples of 1,500 respondents in each country, provided by the market research company Respondi. Quota sampling was used to select participants from their opt-in pool in proportions representative of their national populations in terms of age, gender and social class.

4 Analysis and Results

Outcome data come from the forced choice made by respondents regarding which profile in each pair should pay a higher tax rate. The unit of analysis is thus the individual profile and outcomes are measured using a dummy variable that takes a value of 1 if a profile is chosen and 0 if a profile is not chosen. The total number of observations is therefore equal to the number of respondents $\times$ 10 (5 tasks $\times$ 2 profiles per task). After removing uninformative responses my full dataset comprises 62,572 observations from 6,341 different respondents in 4 countries.[25][26]

Since I will be comparing preferences across countries, I calculate Marginal Means (MMs) rather than the more standard Average Marginal Component Effects (AMCEs) used in conjoint analysis. MMs measure the percentage of times respondents choose a profile with a given attribute level, averaging over all other attributes (Leeper, Hobolt and Tilley 2020). Since in a forced choice conjoint design respondents choosing between profiles purely at random would result in a MM of 50%, values above 0.5 indicate features that increase the favorability or probability of selection of a profile and values below 0.5 indicate features that decrease profile favorability. As such, MMs though descriptive present two important advantages over causal AMCEs. First, they convey information about preferences for all feature levels, including baselines (while AMCEs provide causal effects of other features relative to the baseline). This means they provide information of absolute -rather than relative- favorability, allowing us to identify attribute levels that

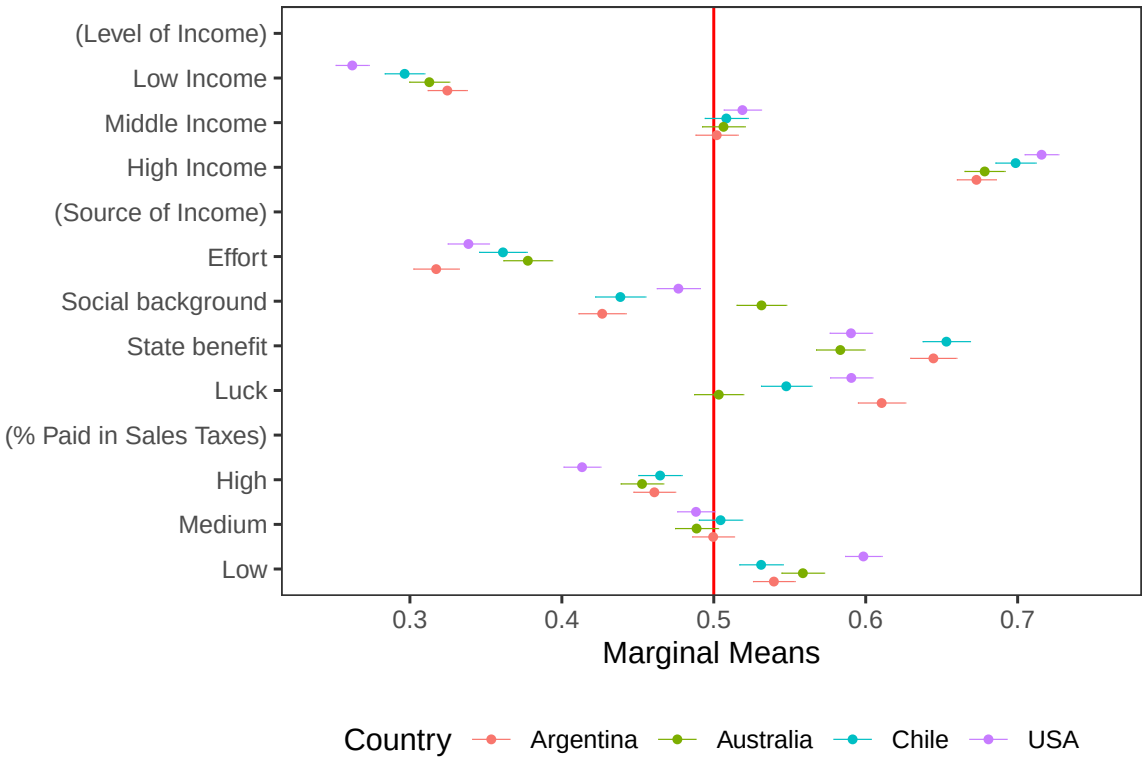
[25] I excluded respondents who completed the survey in less than half of the median time, and I also excluded choices from pairs in which both profiles had the same attributes.

[26] 1946 respondents in the U.S., 1450 in Australia, 1418 in Chile and 1527 in Argentina.

increase/decrease the overall probability a profile will be chosen. This distinction is important, for an attribute value with a positive AMCE (indicating this attribute value increases the probability of selection relative to the baseline attribute value), may have a MM below 0.5, indicating that overall having that attribute level still reduces the probability a profile will be chosen (though not as much as having the baseline attribute level). Second, when it comes to comparing preferences across groups, conditional MMs are preferable as comparing conditional AMCEs is problematic whenever baseline values are not the same across groups (which is the case here, as in most places) (Leeper, Hobolt and Tilley 2020). On the other hand, by virtue of aggregating individual preferences over both attributes and respondents, AMCEs may be better suited to express the weights individuals assign to different fairness rules in accordance with justice judgment theory. Results using AMCEs are included in the SI section A.5. Importantly, all of the main findings hold regardless of whether MMs or AMCEs are used.

All of the results presented below use the uniform distribution, which was the one used to randomize attribute levels, to weigh profiles (as recommended by Hainmueller, Hopkins and Yamamoto (2014)). To address potential concerns that using the uniform distribution might undermine the external validity of findings (De la Cuesta, Egami and Imai 2019), SI section A.9 shows that results are robust to using the real-world marginal distributions for levels of income and shares of incomes paid in sales taxes.

Figure 2: Who Should Pay the Higher Tax Rate?



Note: This plot shows marginal mean outcomes from forced choice conjoint experiments, by country. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure 2 presents unadjusted MMs by country and confirms the relevance of compensatory arguments for respondents' tax preferences. It shows two things we already knew and four we did not. The level of income attribute extends what was shown by Ballard-Rosa, Martin and Scheve (2017) for the U.S.: in line with ability to pay concerns, and controlling for potential confounders, average preferences are progressive in all four countries. Not only does the probability of being chosen to pay the higher tax rate increase monotonically with level of income, the magnitude of these effects is substantial. In all countries, profiles with the highest income have the largest probability of being selected, suggesting regressive tax systems in Latin America are likely not a result of citizen preferences. Indeed, between 67 and 72% of profiles with the highest level of income were chosen. Moreover, justifications given in response to the open-ended question confirm that choices made on the basis of level of income were guided by ability to pay fairness concerns: respondents claimed taxes will be less of a burden/hardship to that person, or

that she can better afford them.[27]

The source of income attribute also confirms findings from the deservingness literature: those whose income results from effort have the lowest probability of selection, and this probability is higher for those with income resulting from luck, with those benefitting from their social background somewhere in between (Durante, Putterman and Weele 2014; Fong and Luttmer 2011; Lefgren, Sims and Stoddard 2016). Australia is the single exception to this trend, with income resulting from social background leading to a higher probability of selection than luck. Moreover, justifications clearly reference the extent to which people "earned" their income or worked hard for it.

1. General Compensation. The first novel finding here is that people care a lot about compensating for a state benefit. In fact, the effect of state benefit is at least as large as that of luck and usually larger. Indeed, despite the fact that source of income is the only attribute presenting substantive differences in its effect across countries, it is interesting to note that the two sources of income with similar effects throughout are effort (everywhere reduces the probability of selection) and state benefit (everywhere increases it). In terms of causal AMCEs, changing the source of income in a given profile from effort (the baseline) to a state benefit increases the probability it will be selected by between 21 and 33 percentage points on average, depending on the country. This suggests that regardless of levels of inequality, tax progressivity or redistributive effort, citizens across very different contexts share the expectation that the state should treat everyone equally and want violations of this principle to be corrected through higher taxes. This finding underscores the importance of compensatory arguments in explaining tax preferences, and the need for studies of deservingness to expand upon the basic effort-luck distinction. Furthermore, as predicted by justice judgment theory, the effect of state benefit appears to be independent of whether it is targeted at the rich or not. The fact that a state benefit that was not targeted at the rich had such a large effect indicates

[27]It could be argued that choices based on level of income are driven by efficiency rather than fairness concerns. Open-ended justifications, which were manually coded, indicate that decisions were largely driven by fairness concerns: not only did respondents overwhelmingly explain their decisions in terms of the fairness concerns hypothesized; the most sparing among them simply said they chose profile x because it was fair.

compensatory arguments based on privileges granted exclusively to the rich can indeed be powerful enough to shift mass preferences and policies in a more progressive direction. We will examine the moderating role of level of income below.

Open-ended justifications show that in all countries, respondents reacted to the state benefit source of income by demanding a payback of benefits granted by the state.[28] Sample justifications include "Because he is responsible for repaying what he gets from the government as a subsidy" (Argentina) or "Bailed out by the government and should be charged a higher tax rate to compensate for that" (U.S.). The U.S. did stand out however as being the only country in which a significant share of respondents (around 20%) think individuals benefitting from the state should pay a higher tax rate not just to compensate for this benefit but as punishment for taking money from the government.[29] Example justifications include: "Because they deserve to be penalized for being bailed out" or "They got bailed out by tax payer money. That is wrong". These types of preferences are however consistent with recent findings showing respondents in the U.S. use high taxes to punish corrupt businesspeople Tella, Dubra and Lagomarsino (2016). Moreover, they remind us that while fairness is often linked to altruism, it also involves an inclination to punish those who are perceived as dodging their fair share of societal burden, as shown by Fehr and Gächter's seminal public goods experiment (2000).

2. Special Compensation. The second novel finding is that regressive consumption

[28]Justifications revealed that a small portion of respondents (7.6% in Argentina, 9% in Chile, 0.6% in Australia and 0.6% in the U.S.) chose profiles with the state benefit source of income not because they received bailouts or subsidies but because they owned companies and therefore i) had more control over their income or ii) by principle should pay more than a mere employee. Excluding respondents who interpreted the state benefit source of income in this way does not change the pattern of results in any way.

[29]Qualitative research on tax attitudes in the U.S. reveals Americans attach great importance to paying taxes. They see its as a civic obligation, a responsibility owed to society, and proof that one is a contributing member of the community. Even in comparative terms, the belief that taxpaying is a moral responsibility and tax evasion is morally wrong seems to be particularly strong in the U.S. (Williamson 2017). This may help explain why reactions to the perception that people are taking advantage of tax payers or are not paying their fair share (as implied by the sales tax burden question discussed below) are particularly strong in the U.S.

taxes also matter for tax preferences, as indicated by the percentage of income paid in sales tax attribute. In accordance with the application of compensatory arguments, the effect of this attribute is also monotonic, with the probability a profile will be chosen increasing as the share of its income paid in sales taxes decreases. In addition, this attribute presents two policy-relevant particularities. In the first place, unlike most other attributes, its effects represent a strong consensus. That is to say, the level of favorability garnered by this attribute does not significantly vary across different politically relevant groups, expressing a general agreement that surpasses even class and party cleavages.[30] Secondly, both choices and justifications show respondents have a strong commitment to horizontal and vertical equity, as they seek to equalize tax rates whenever income levels are the same, and dislike the combination of high income and a low share paid in sales tax. In fact, in the U.S. 89% of the profiles that combined a higher income and a lower tax rate were chosen, regardless of the source of income.[31] This commitment to vertical equity could well be mobilized politically given the objective regressivity of indirect taxation.

Moreover, it is worth highlighting that source of income and share of income paid in sales tax did not operate as subsidiary criteria, used only when levels of income were equal. In fact, between 18 and 30% of the choices made on the basis of the receipt of a state benefit involved picking profiles with a lower level of income.[32] Similarly, between 12 and 18% of the choices made on the basis of share of income paid in sales tax also required picking a profile with a lower level of income.[33] This suggests a significant portion of respondents privilege a compensatory fairness rule over the more established ability to pay ideal.

3. Comparing Fairness Arguments. The third novel finding in figure 2 comes from elucidating the relative importance of the different fairness concerns. It clearly shows that ability to pay concerns have the largest effect on the probability of selection, an effect that can furthermore be expected to continue to grow with the level of income. Compensatory arguments are also shown to be substantively important though. In terms

[30]See SI for results by respondent party identification and by respondent income.

[31]This percentage was significantly lower, at between 78 and 81% in the other three countries.

[32]The exact percentages were 18% in the U.S. sample, 21% in Chile, 26% in Australia and 30% in Argentina.

[33]The exact percentages were 12% in Chile and Argentina, 16% in the U.S. and 18% in Australia.

of magnitude, state benefits have the largest positive effect on the probability of selection after level of income in all countries.[34] This, despite the fact that the effect of the state benefit source of income can be thought of as representing a lower bound (inasmuch as it is not targeted at the rich nor associated with a time of crisis). Finally, the effect of the share of income paid in sales taxes, while smaller, is still non-negligible, with an effect size at least as large as luck in most countries.

4. Cross-Country Similarities. The fourth novel finding is the similarity in trends across all four countries. Indeed, despite large differences in culture, institutions and socio-economic characteristics, both magnitudes and relative ordering of MMs are remarkably similar across countries, with the exception of sources of income in Australia.[35] This finding accords well with Aarøe and Petersen (2014)'s argument that cross-national differences in welfare state preferences hide micro-level similarities in psychological predispositions. It thus highlights the importance of institutions in explaining differences in political outcomes across countries.

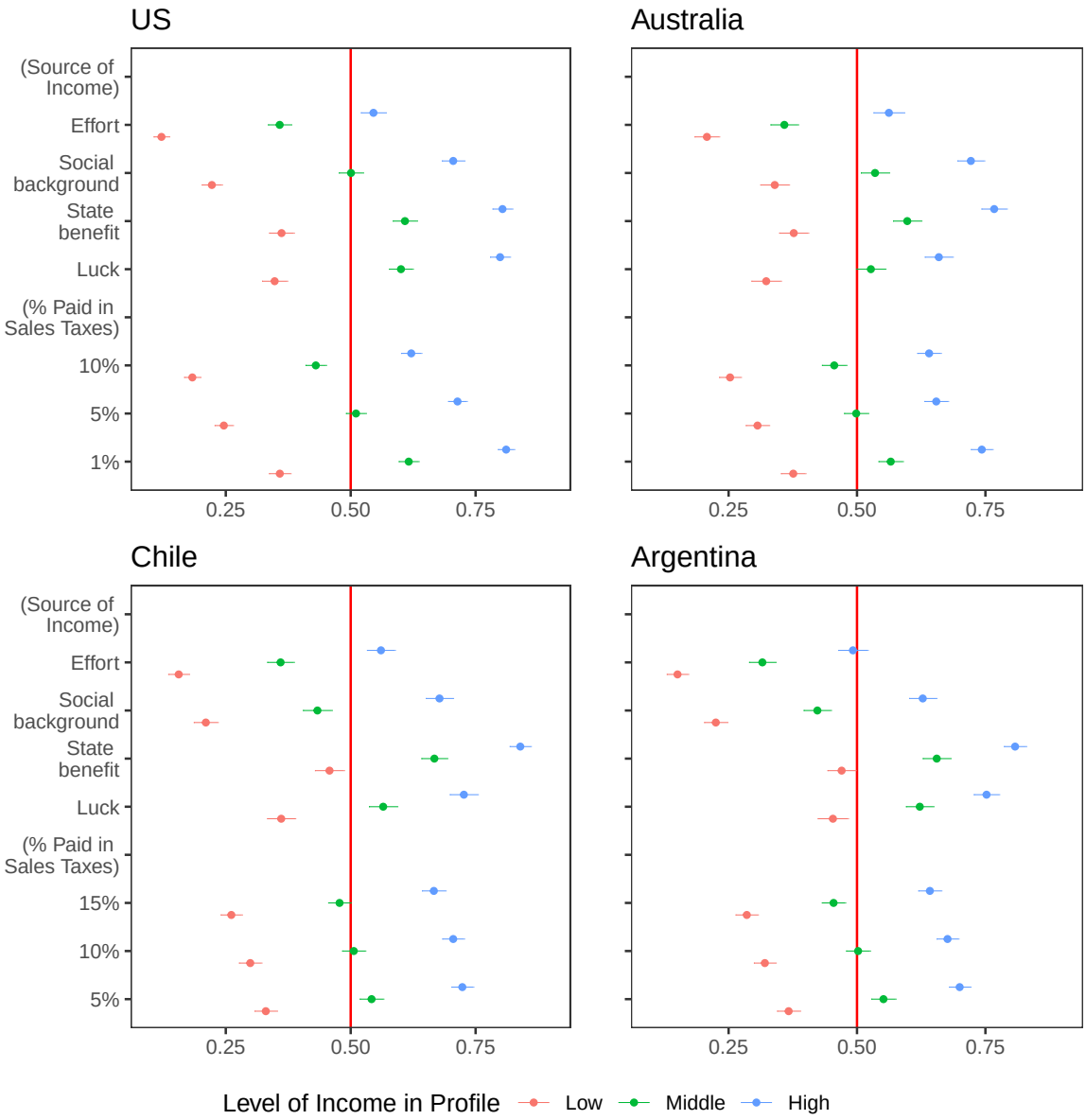
4.1 What if They Are Rich?

In addition to pooled results, conjoint designs also allow the examination of interactive relationships between different attributes. Above, I have argued that the effects of compensatory arguments can be expected to be even larger when they are targeted at the rich. One way of evaluating this is to look at how the effect of a state benefit varies with the level of income in the profile. To see this graphically, figure 3 presents marginal means by level of income in the profile for each country.

[34]In the case of the US, the 1% share paid in sales taxes and luck and state benefit sources of income are all tied for this largest effect (after level of income). If we scale estimates by taking into account differences in probability of co-occurrence across attributes (Leeper, Hobolt and Tilley 2020), the estimate for 1% is slightly larger than for the other two (0.67 vs 0.63).

[35]On the other hand, the singularity of Australian results, while puzzling, confirms that the similarity of preferences captured by the survey is meaningful and not an artefact of design choices.

Figure 3: Marginal Mean Outcomes by Level of Income in Profile



Note: Plots shows marginal mean outcomes from forced choice conjoint experiment, estimated separately for profiles with different levels of income. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure 3 clearly shows that across countries, being paired with a higher level of income monotonically increases the favorability of all other attributes. In fact, profiles with a low level of income are unlikely to be chosen, whatever their other attributes, while the opposite happens to profiles with a high level of income. Thus, while state benefits do have a larger probability of selection when paired with a high level of income, they are in no way unique in this regard, as the same is true for all other attributes (and to a

similar extent). Nonetheless, three unique aspects of state benefits bear noting. One, when combined with the highest level of income, the union of compensatory and ability to pay concerns results in state benefits having the largest probability of selection (for the US and Australia this includes tax benefits). Two, unlike luck or other sources of income, in the real world the case can often be made that state benefits are in fact targeted at the rich, boosting their political potency.[36] Finally, as we will see below, in most countries preferences of liberals and conservatives are not significantly different when it comes to state benefits (both tax and non-tax), and when they are (as in the case of non-tax state benefits in the U.S.) it is conservatives who are most likely to apply compensatory arguments. This suggests compensatory arguments may have the potential to expand the basis of support for progressive taxes to a key constituency averse to ability to pay arguments.

4.2 Alternative Explanations: Equal Treatment

As already mentioned, compensatory arguments can be thought of as the flip side of equal treatment preferences: given that the state should treat everyone equally, if it does not then compensatory demands arise in an attempt to restore equality. Does this mean compensatory demands are actually explained by equal treatment preferences? Justice judgment theory suggests this should not be the case, and this is indeed what I find.

Figure A.7 presents marginal means separately for respondents who think everyone should pay the same tax rate, and those who think some should pay more than others. Between 20 and 30% of respondents in each country exhibited equal treatment beliefs.[37] These results add to existing evidence that equal treatment beliefs are widespread — beyond the U.S. and Europe—, and correlated with less progressive tax preferences as

[36]To a certain extent the same can be said about social background, as the rich can enjoy unparalleled opportunities. However, results from my formative studies suggest sources of income resulting from one's social background are often perceived as either resulting from blind (as in unbiased) luck, or nonetheless requiring some level of effort, which explains their intermediate effects. Conversely, while some groups like to claim that the rich exert higher levels of effort, there is no objective evidence of this.

[37]The percentage of respondents with equal treatment preferences in each country are as follows: 24% in the U.S., 29% in Australia, 19% in Chile and 27% in Argentina.

evidenced by the level of income attribute. However, in all of the countries in the sample sensitivity to compensatory arguments is not limited to people with equal treatment beliefs,[38] suggesting the state benefits included in the survey violate a more basic and widespread expectation of equality before the law.

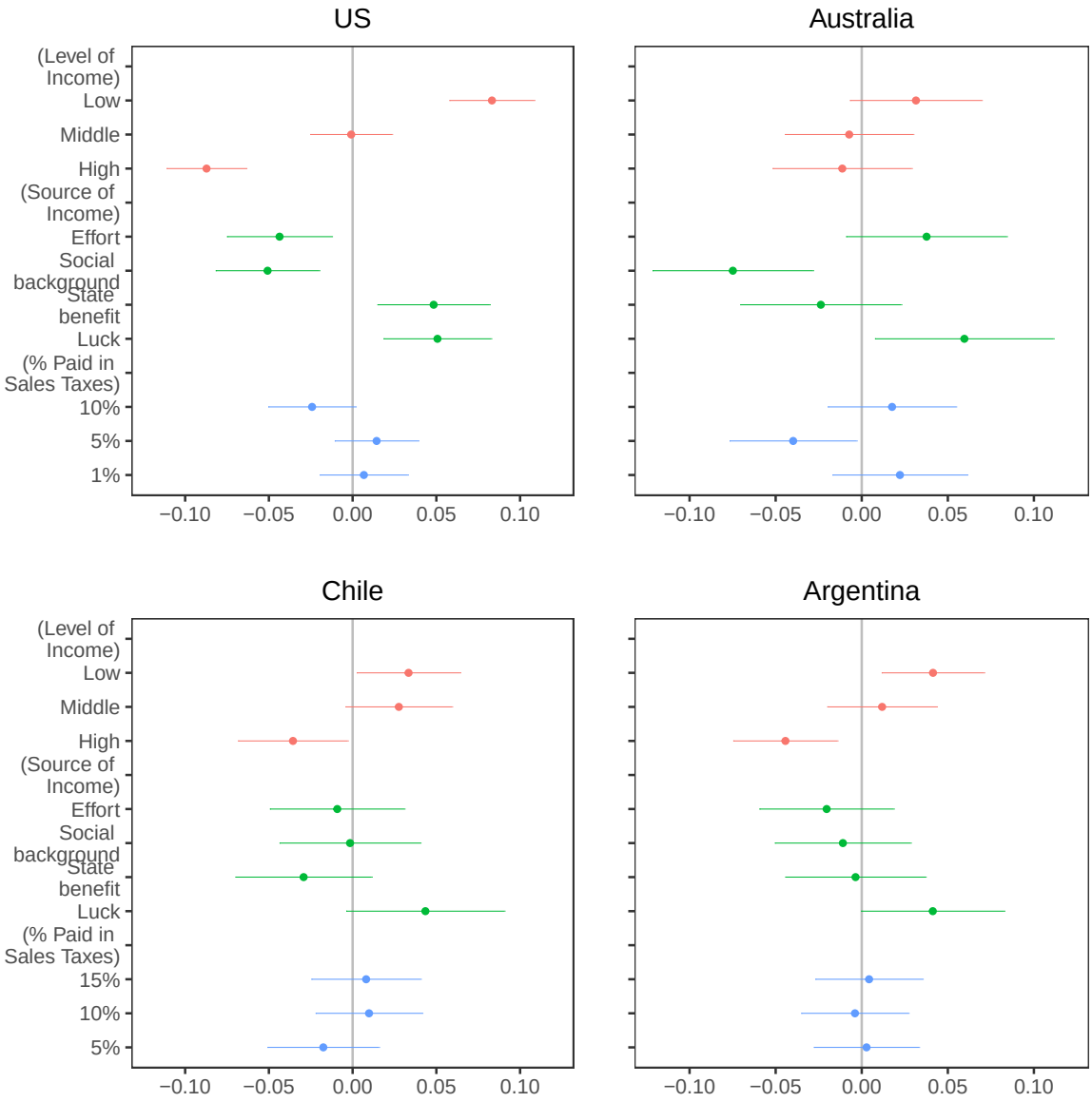
4.3 Probing Political Viability: Ideological Differences

So far we have considered only average preferences, but as social choice theory teaches us, political outcomes are the result of the interplay of both preferences and the institutions tasked with aggregating them. Indeed, one would be hard pressed to explain differences in redistributive and tax policies across the countries studied only on the basis of the individual preferences revealed here (or elsewhere). One important institutional factor to consider when it comes to tax policy reform is the need to reach consensus across multiple parties, making ideological differences between them particularly relevant. As a way of getting at this with the data at hand I examine whether preferences surrounding state benefits vary significantly by party identification or self-reported ideology.[39] If it were the case, for example, that only Democrats cared about the unequal distribution of the burden of indirect taxes, this would make it less likely that compensatory arguments could lead to an increase in tax progressivity.

[38]This measure of equal treatment as support for flat taxes is undoubtedly more restrictive and less nuanced than the one used by Scheve and Stasavage (2021), who measure adherence to equal treatment with a survey question asking respondents whether the state should treat citizens equally regardless of circumstances or take into account economic or other advantages or disadvantages on a scale from 1 to 5. However, it is more relevant to the subject at hand and high levels of support across all countries suggest it is not too extreme.

[39]The obvious implicit assumption here is that parties are responsive to the preferences of their partisans, which is standard in the context of democratic polities. Nonetheless, recent evidence from Europe does question the strength of this link (Klüver and Spoon 2016; Romeijn 2020).

Figure 4: Differences in Marginal Means by Respondent Ideological Self-Placement



Note: Plots show estimated differences in conditional marginal mean outcomes by respondent ideological self-placement (left and center-left vs right and center-right). Estimated differences are right-left wing. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure 4 presents estimated differences in the preferences of left and right wing respondents in each country.[40] As expected, ability to pay preferences are quite polarized in almost all countries (with the exception of Australia), with liberals more likely to

[40]Ideological self-placement was determined on the basis of the question "On economic policy matters, where do you see yourself on the left/right spectrum?", which had a 5-point response. See SI figure A.12 for marginal means by ideological self-placement (as opposed to the differences between them).

choose high income profiles and less likely to choose low income ones than conservatives. However, when it comes to state benefits we see that in the case of the state benefit source of income the only country where there are significant ideological differences is the U.S. where it is notably conservatives who are more sensitive to this source of income than liberals. In the case of tax benefits, there are no systematic differences in any of the countries, with respondents across ideological groups more likely to choose profiles with a lower tax payment and less likely to choose profiles with a higher tax payment. These results suggest building a broad enough consensus for tax reform on the basis of compensatory arguments should in principle be possible.

Moreover, this pattern of results holds whether using vote choice or party identification or the complete range of ideological self-placement (including centrists) to define subgroups. Nonetheless, I focus on ideological self-placement because party identification is very low in Latin America (making me lose more than 80% of observations in some countries), and vote choice is subject to strategic considerations beyond ideology.[41]

U.S. results, which stand out for their high level of polarization, deserve further discussion. They show a clear pattern of differences between liberals and conservatives, with liberals more likely to decide on the basis of a profile's level of income and conservatives more likely to decide on the basis of its source of income.[42] This is consistent with an ideological story whereby liberals apply ability to pay considerations and prefer redistributive, progressive taxation, while conservatives apply deservingness considerations that are not linked to progressivity.[43] Moreover, this is also in line with research arguing conserva-

[41]See SI for results using vote choice, party identification and self-placement including centrists.

[42]These differences are not simply an expression of self-interest, as income is not highly correlated with party identification or ideology in the sample (Spearman's ρ=0.10 and 0.11 respectively), and controlling for respondent income does not alter the results.

[43]While ability to pay principles express support for progressive taxation and therefore redistribution, deservingness and compensatory principles do not have direct implications for the distribution of the tax burden across income groups. Nonetheless, deservingness arguments are often used to oppose progressivity by conflating effort and wealth (arguing the rich deserve their wealth because they have exerted more effort). On the other hand, compensatory arguments have also often been used to promote progressivity by demanding the rich pay higher rates of income taxation in accordance with the special compensatory theory described above.

tives in the U.S. prioritize procedural justice rules while liberals give more weight to fair outcomes by applying distributive justice rules (Miles 2014). Differences with respect to the state benefit source of income are in this sense broadly consistent with prior research showing large partisan gaps when it comes to tax policy views in general and fairness concerns in particular (Stantcheva 2020). They also suggest that despite broad agreement regarding the fairness of compensation, the polarization of public debate around taxes and the role of the state in the U.S. may have permeated even into this relatively less salient aspect of it. The singularity of the U.S. case is something future research should investigate further. Large ideological differences and the ensuing difficulties in building cross-party consensus may be part of the reason why redistribution in the U.S. is much lower than in other advanced democracies (Elkjaer and Iversen 2021). Notably however, tax benefits are the one attribute over which preferences coincide even in the U.S.

5 On Wars, Pandemics and External Validity

As all experiments, this one's limitations are most evident when it comes to external validity. Findings presented here show that when we isolate tax fairness preferences respondents across a broad variety of settings care a lot about compensating for state benefits, and favor using taxes as a way of achieving this. The extent to which this informs policy decisions in the real world will however depend on a number of factors on which the experiment provides little insight.

At the individual level, tax preferences are not only guided by fairness ideals, but also self-interest and efficiency considerations. The fact that the experiment was relatively successful in isolating fairness concerns,[44] means it cannot tell us much about how much weight these other-regarding concerns would have relative to more self-serving considerations. While more research is needed on this, what research we do have shows "fairness views appear to be the most important factor in shaping support for tax policy", much more so than self-interest or efficiency concerns (Stantcheva 2020, p. 4). Thus, while

[44]Breaking down results by respondent income level (see SI section A.8) shows income only slightly moderates ability to pay preferences, suggesting the experiment did a good job of minimizing self-interest bias and capturing fairness preferences instead.

the preferences captured here may not be exactly those informing tax policy, they are arguably a major component of it.

Perhaps a more important obstacle to external validity is the fact that in the real world state benefits are not as clear as in the experiment, among other things because people have more than three attributes and it is often hard to figure out which ones are relevant. Yet we know from previous research that this has not prevented compensatory demands from being associated with important increases in tax progressivity in the past (Limberg 2019; Scheve and Stasavage 2016). I would thus argue that while crises are not necessary for compensatory demands to exist, wars, financial crises and —possibly— pandemics, do play a crucial role in making them salient. The political power of compensatory demands seems to highly depend on context, which determines both whether elites raise these kinds of arguments and whether they resonate with publics.

This ties up with the broader research on fairness, which highlights that while fairness allocation rules are broadly agreed upon, disagreement arises when it comes to applying abstract rules to concrete situations (Trump 2020). Context becomes key in facilitating agreement over the relevance of specific fairness arguments. In this case, massive asymmetric shocks provide a solution to the problem of impracticability highlighted by Seligman in the 19th century: we do not need to measure all of the ways in which the state has contributed to inequalities, only the most obvious, scandalous ones. This point is also made by Scheve and Stasavage, who point out that "if arguments about compensation are to carry much weight politically, the initial unfairness corrected must be obvious and its magnitude must be large" (Scheve and Stasavage 2016, p.22). People may care about compensation generally, but for it to carry weight politically, crises situations seem to provide important background conditions.

Finally, even if compensatory demands are an important driver of tax preferences in general (and not just tax fairness preferences), the extent to which these inform actual tax policies depends on the processes through which policies are created. This criticism, which extends to all studies of individual preferences, highlights the importance of, and complementarity with, the institutional approaches referenced in the introduction. Perhaps the only point worth adding here is that even if democratic institutions are flawed,

certain crisis situations that increase demands on the public, may also force politicians to be especially attentive to their preferences.

6 Conclusion

This paper has provided direct, descriptive and causal evidence that compensatory theory is an important driver of tax preferences in general, and tax progressivity in particular. This is true both for non-tax state benefits —such as bailouts or subsidies— and tax benefits —such as regressive consumption taxes—. Moreover, it holds across four different countries with very different institutional, economic and cultural features. While external validity is always a limitation of experimental research, these findings are encouragingly aligned with more descriptive studies arguing compensatory demands have been successful in driving increases in tax progressivity in the past (Limberg 2019; Scheve and Stasavage 2016).

Results are consistent with prior work arguing that compensatory arguments can be expected to be most compelling when state benefits are specifically granted to the rich, and in the context of a crisis. However, while the type of non-tax benefits granted under these circumstances generates the largest effects, the special type of tax benefits that characterizes peacetime tax regimes also offers an opportunity to demand compensation in the form of progressive taxation. The fact that many countries find it difficult to shift away from their reliance on indirect taxation suggests the conditions for compensatory arguments to arise may be more readily available than previously thought.

In relative terms, the overall effect of compensatory arguments is shown to be smaller than that of ability to pay concerns. However, it is at least as large as (and often larger than) well-established deservingness concerns. Furthermore, they exhibit two potentially important advantages when it comes to promoting tax progressivity. In the first place, they appeal to a broader set of voters than ability to pay, appearing to overcome the partisan and class divisions that typically impede tax reform. In the second place, compensatory arguments are particularly compelling when state benefits are targeted at the rich, a situation that seems to be becoming habitual. And while increases in the share of

income accumulated by the rich may be gradual, making it difficult to mobilize ability to pay concerns, evidence of large and conspicuous benefits to the rich can provide effective focal points for political mobilization.

Indeed, the political success of compensatory arguments will ultimately depend on their effective mobilization by political elites. And here again the limitations of my experimental approach come up. My purpose here was to test whether the public is sensitive to this type of arguments; their actual effectiveness will largely depend on the political supply side, an aspect on which this experiment provides no insight. In fact, while I show that conservatives may in principle be open to compensatory arguments that justify taxing the rich, in practice these positions may change as tax policy discussions become —as they often do— strongly politicized.

At the start of the paper I highlighted an explanation for why redistribution has not kept up with rising inequality: because people care about maximizing fairness, not equality. And when it comes to fairness, my experiment shows that while the distributive aspects captured by ability to pay concerns are important, they are not —as assumed by optimal tax theory— the whole story. Procedural considerations, including those linked to unequal state benefits, matter a great deal as well. As such, my results support Tom Tyler's evaluation that public discontent over inequality will remain muted as long as people believe that it results from fair allocation procedures (2011). By bringing to the fore unfair procedures linked to state interventions, compensatory demands are well-suited to mobilize public demands for progressivity, without needing to modify deep-rooted beliefs about the fairness of markets.

Which brings me to the current situation. As the Covid-19 pandemic continues to unfold, analogies with mass mobilization wars are hard to avoid. The distribution of burdens can easily be argued to be similar: essential workers, who are disproportionately low income, see their lives and livelihoods at risk, while the rich grow richer. Reactions are also similar: calls for increasing taxes on the rich are emerging all over the globe. However, compensatory theory suggests that their success will depend on the extent to which political actors are able to show not just that the rich are profiting while the rest

suffer,[45] but that this is the result of deliberate actions (or lack thereof) by the state. The role played by compensation in driving demands for progressivity in the context of the pandemic should be addressed in future research.

[45]A point that is increasingly being made by the media, as well as non-profits. For examples of the former see CNN, "US billionaires have regained $565 billion in wealth since the pit of the crisis", June 5th 2020, https://edition.cnn.com/2020/06/04/business/billionaire-wealth-inequality-pandemic-jobs/index.html (accessed July 1st 2020) or Reuters "Wall Street ends 2020 with embarrassment of riches", December 3rd 2020, https://www.reuters.com/article/us-usa-banks-breakingviews-idUSKBN28R2U9 (accessed March 14th, 2021). For an example of the latter see the Fight Inequality Alliance's "News Release: Billionaire Pandemic Tax", August 12th 2021, https://fightinequality.org/news-release-billionaire-pandemic-tax (accessed August 21st 2021).

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A Supplementary Information

A.1 Case Selection

Figure A.1: Market Inequality and Redistributive Effort

Note: This graph shows mean estimates of the gini index of inequality in equivalized household market income and absolute redistribution from the Standardized World Income Inequality Database. Graph includes most recent estimates for countries with estimates not older than 2010. Three countries with negative absolute redistribution values are excluded.

A.2 Formative Study

The sources of income used in the experiments were the result of formative studies conducted on independent samples in each country with the purpose of identifying sources of income that i) would be interpreted as the product of effort, social background, state benefit and luck, respectively; ii) were relatively orthogonal to one another; and iii) were independent of level of income. In each study, respondents were presented with different sources of incomes and were asked to express their agreement with the statement that each source of income resulted from luck, effort, state benefit and social background on a 7-point likert scale. Results for the sources of income selected in each country are included below. Each figure shows four histograms with the distribution of responses for the selected source of income in each country.

Figure A.2: Effort

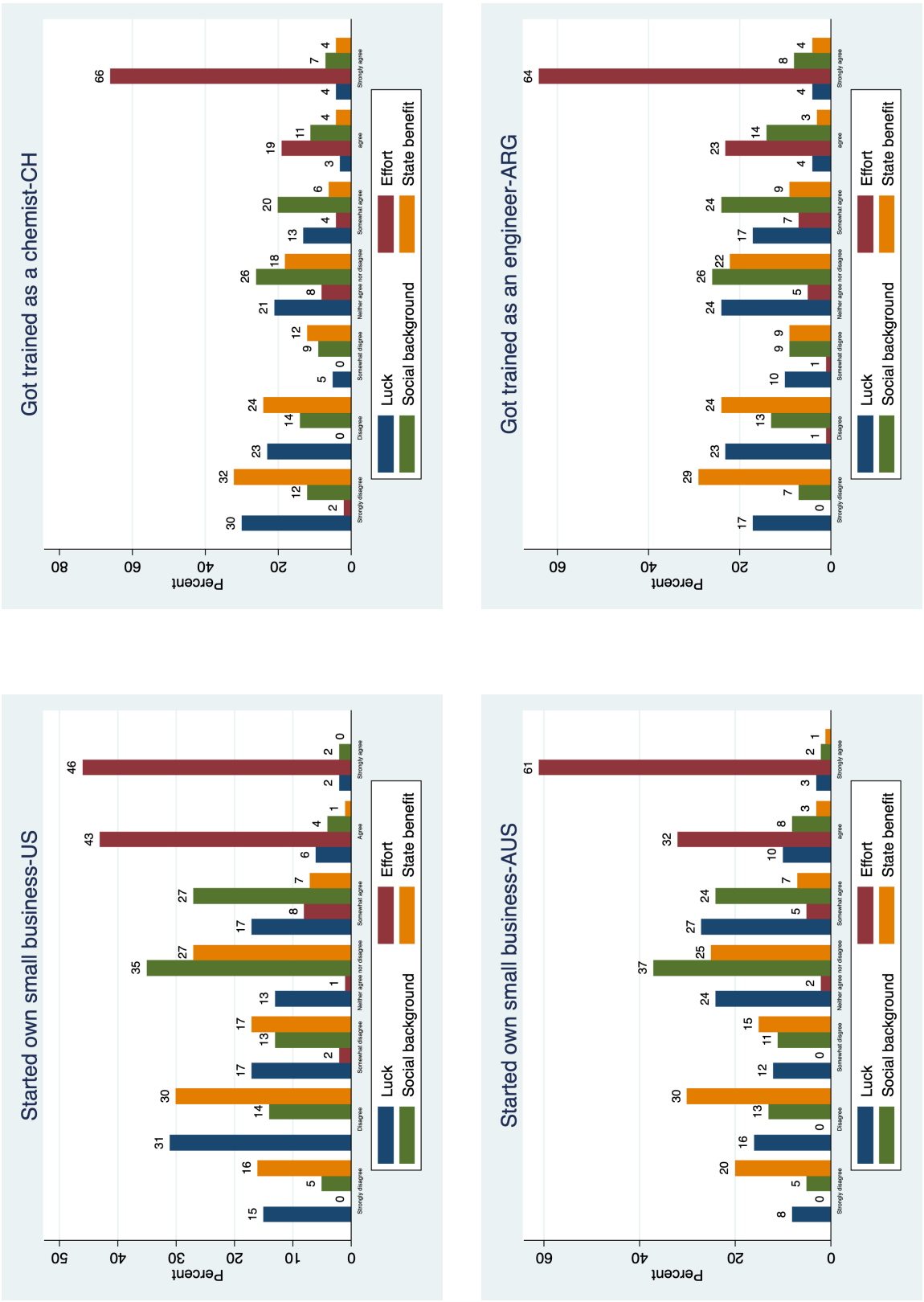


Figure A.3: Luck

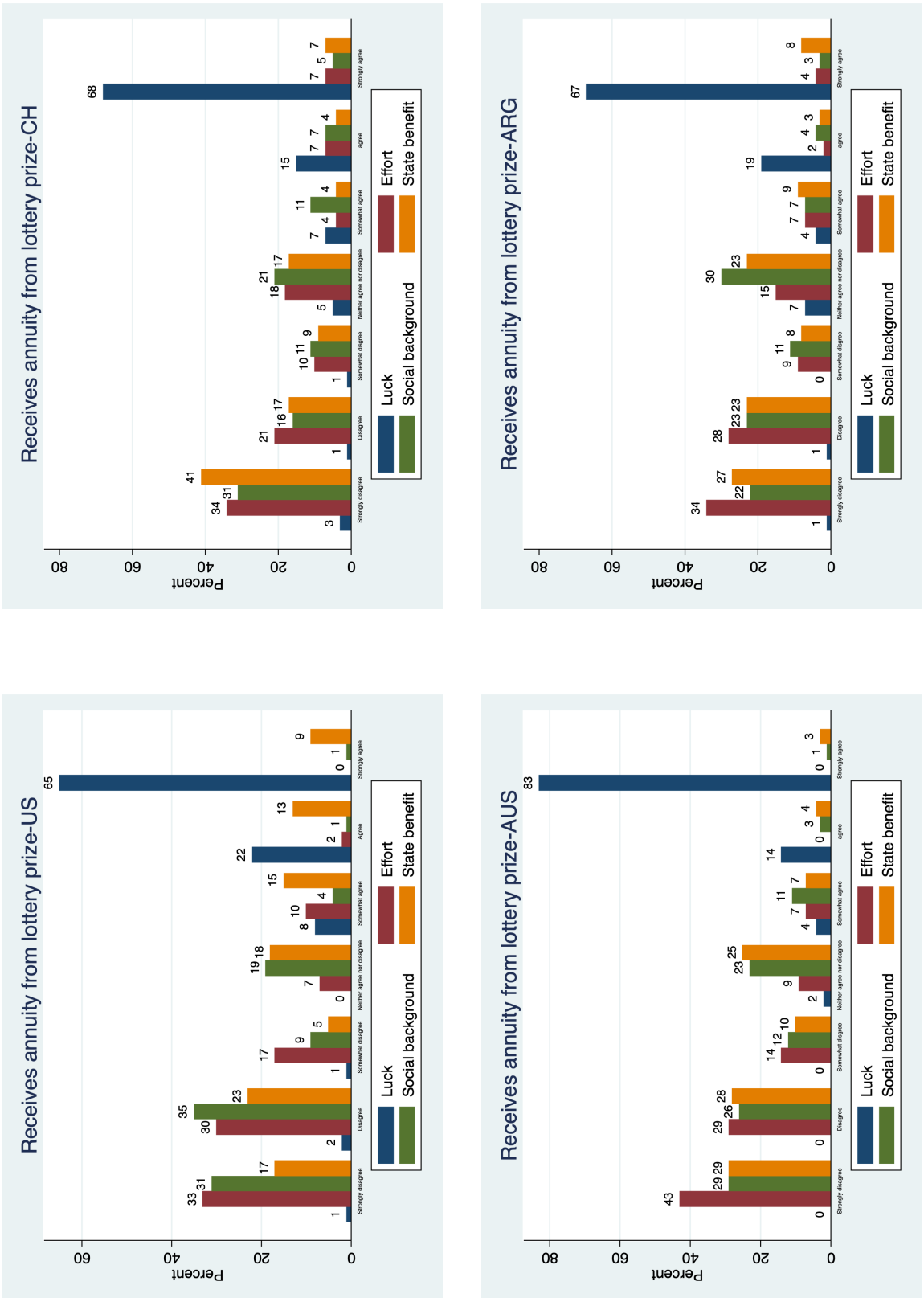


Figure A.4: Social Background

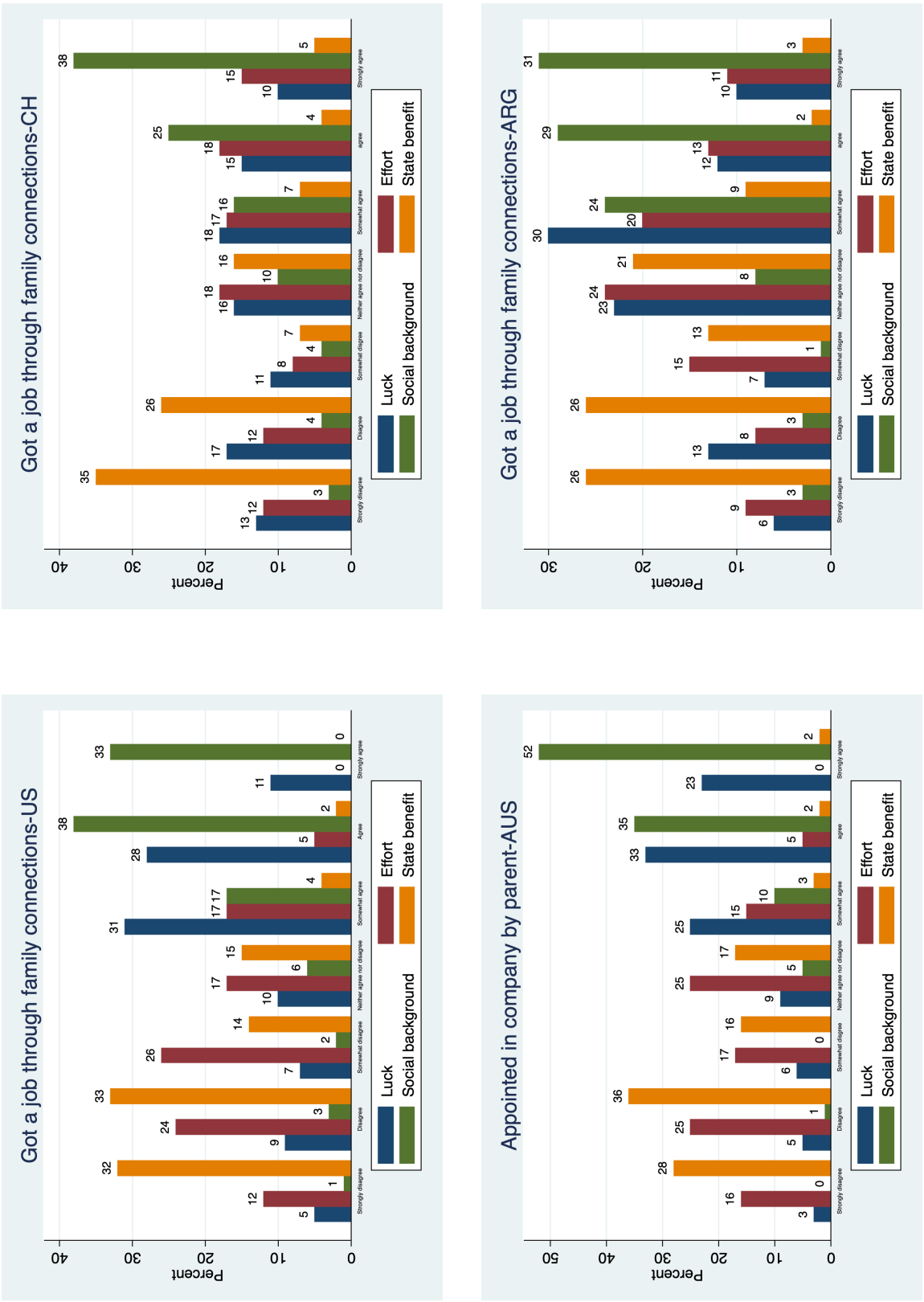
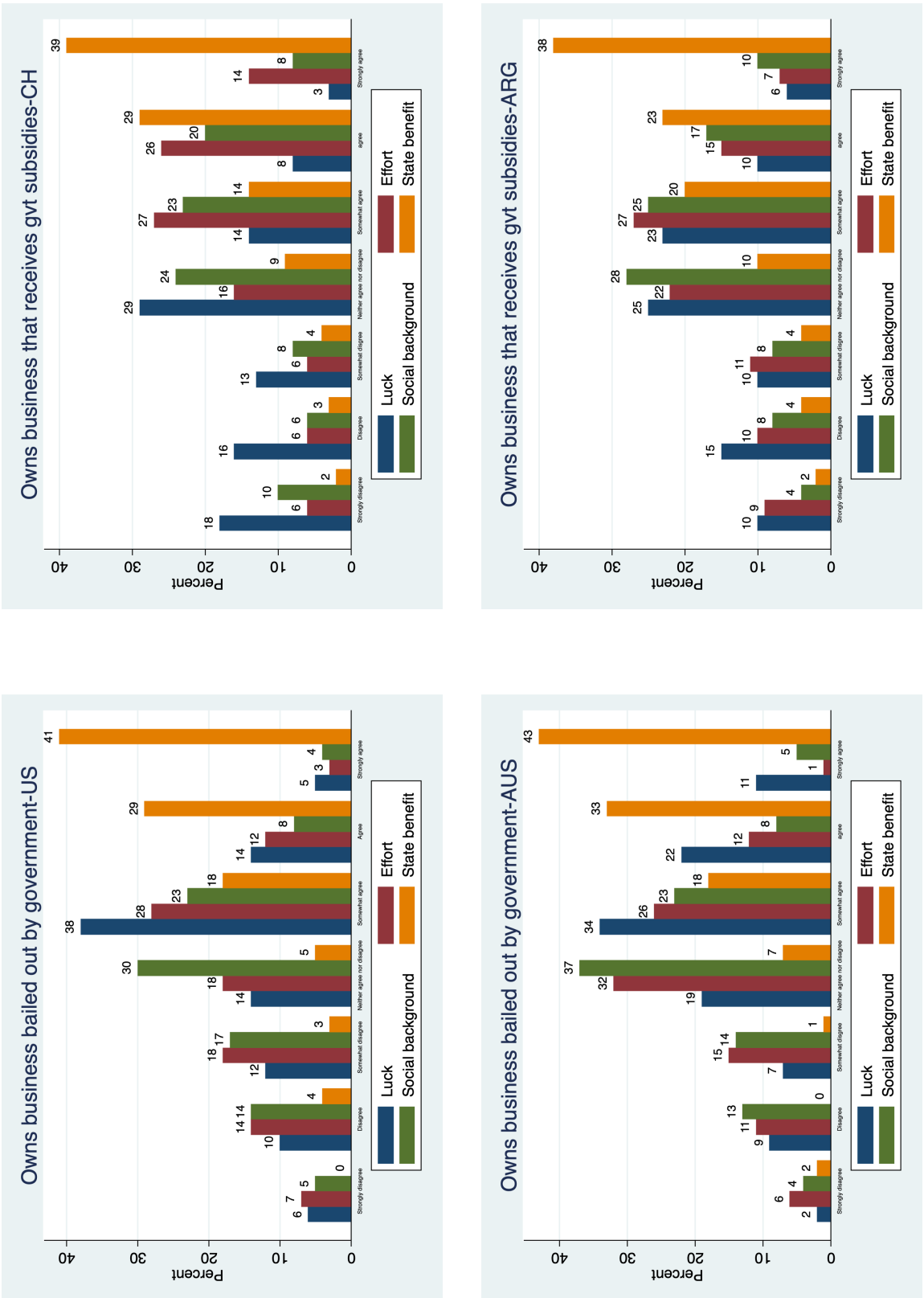


Figure A.5: State Benefit



A.3 Attribute Levels by Country

Table A.1: Attributes and Attribute Levels by Country

Attributes	**Attribute Levels**			
	Argentina	**Chile**	**Australia**	**U.S.**
Level of income	$25,000	$350,000	$40,000	$30,000
	$60,000	$800,000	$90,000	$80,000
	$100,000	$1,500,000	$160,000	$150,000
Source of income	Receives annuity from lottery prize	Receives annuity from lottery prize	Receives annuity from lottery prize	Receives annuity from lottery prize
	Got trained as an engineer and found a job	Got trained as a chemist and found a job	Started own small business	Started own small business
	Got a job through family connections	Got a job through family connections	Appointed by parent in company they direct	Got a job through family connections
	Owns a company that receives government subsidies	Owns a company that receives government subsidies	Owns business that was bailed out by government	Owns business that was bailed out by government
% of income paid in sales taxes	5%	5%	1%	1%
	10%	10%	5%	5%
	15%	15%	10%	10%

Note: Levels of income are in local currencies. To comply with standard practices in each country, monthly incomes were used in Chile and Argentina and annual incomes in the U.S. and Australia.

A.4 U.S. Sample and Weights

As stated in the paper, the U.S. survey was conducted on a sample of 2,000 MTurk respondents. The task was published in four batches between the 17th and 18th of October 2017, with the condition that respondents could not participate more than once. The first two batches, of 500 and 1,000 respondents had the restriction that only workers located in the US and with an approval rate of 90% or above could participate. The last two batches, of 300 and 200 respondents, had the additional restriction that respondents had to have annual household incomes above $100,000 and below $25,000, respectively. This was done with two objectives. The first was to ensure sufficient power for analyses involving splitting the sample by income (testing for the presence of self-interest). The second was to make sure representative population weights could be constructed without having to rely on a small number of observations of underrepresented high and low income respondents.

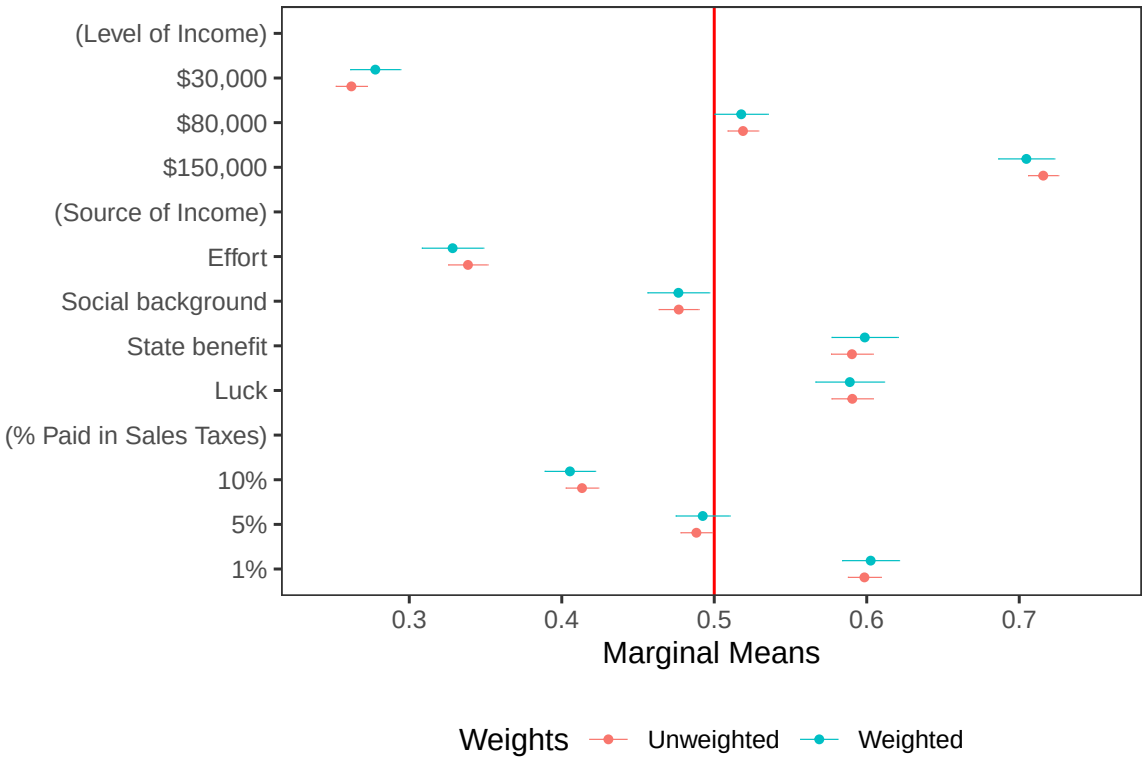
Once the sample was ready, entropy balancing weights (Hainmueller 2012) were constructed to adjust the sample to the margins of the adult population on age, gender, education, race, household income, partisanship and census region. Table A.2 presents the distribution of socio-demographics in the raw sample, the weighted sample, and the population. Weights range between 1 and 15.

Table A.2: Distribution of Socio-Demographics

Group	Raw Sample	Weighted Sample	Population
Gender: Male	.50	.49	.49
Race: White	.79	.78	.78
Age: 18-29	.29	.21	.21
Age: 30-49	.55	.34	.34
Age: 50+	.17	.45	.45
Education: Some college or less	.33	.60	.60
Education: College graduate	.51	.29	.29
Education: Post-graduate	.16	.11	.11
HH Income: $9,999 or less	.06	.05	.05
HH Income: $10,000-$19,999	.09	.07	.07
HH Income: $20,000-$29,999	.11	.08	.08
HH Income: $30,000-$39,999	.10	.09	.09
HH Income: $40,000-$49,999	.09	.08	.08
HH Income: $50,000-$79,999	.20	.21	.21
HH Income: $80,000-$99,999	.09	.11	.11
HH Income: $100,000+	.25	.32	.32
Region: Northeast	.20	.18	.18
Region: Midwest	.21	.21	.21
Region: South	.40	.38	.38
Region: West	.19	.23	.24
Party ID: Democrat	.44	.35	.35
Party ID: Republican	.22	.28	.28

NOTES. Population data comes from the 2016 Current Population Survey Annual Social and Economic Supplement, except for party identification data, which comes from the 2016 ANES Time Series Study.

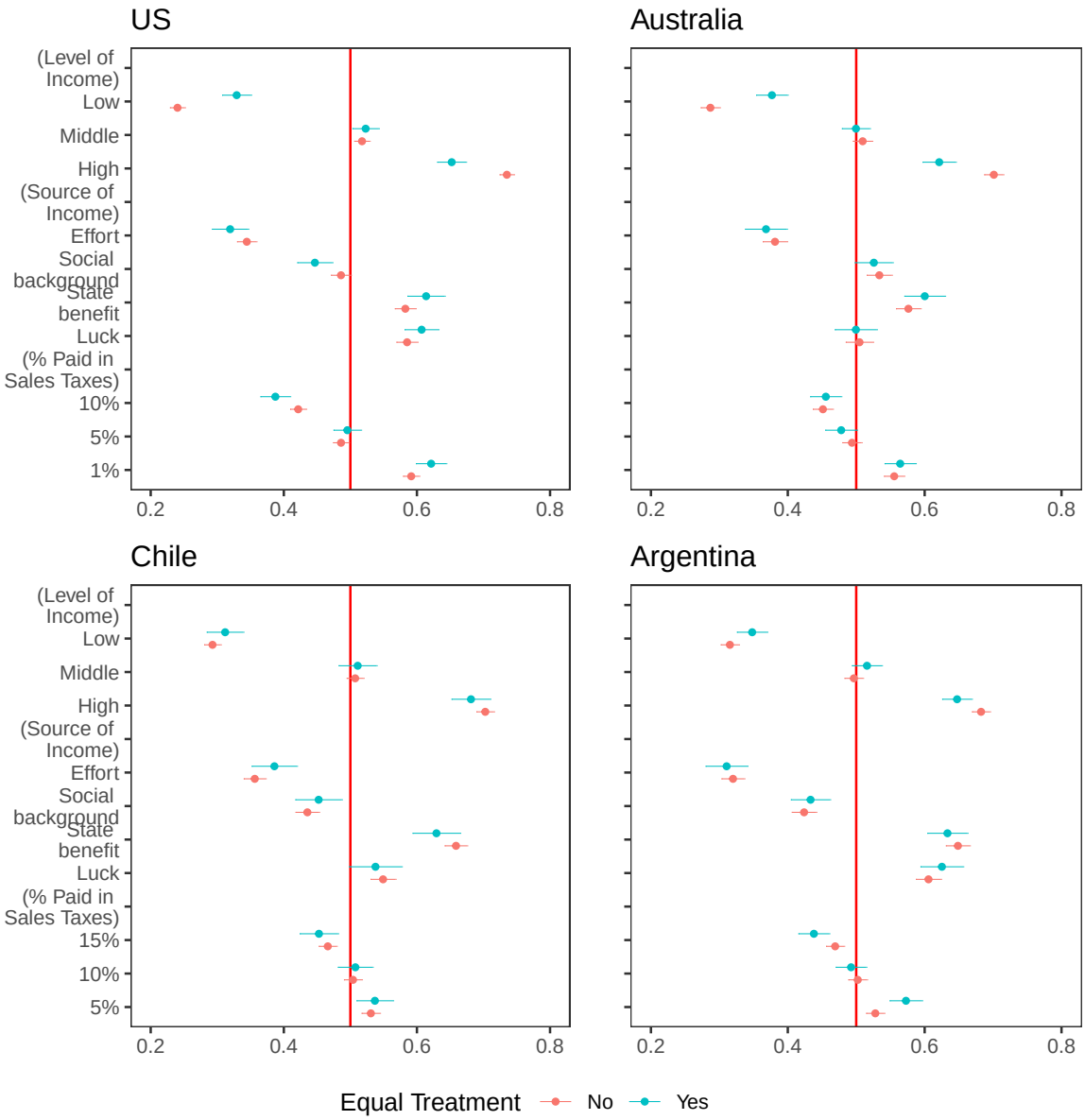
Figure A.6: Weighted and Unweighted MMs for U.S.



Note: This plot shows marginal mean outcomes from forced choice conjoint experiments, with and without entropy balancing weights. Standard errors clustered by respondent. Bars represent 95% confidence intervals.

A.5 Alternative Explanations: Equal Treatment

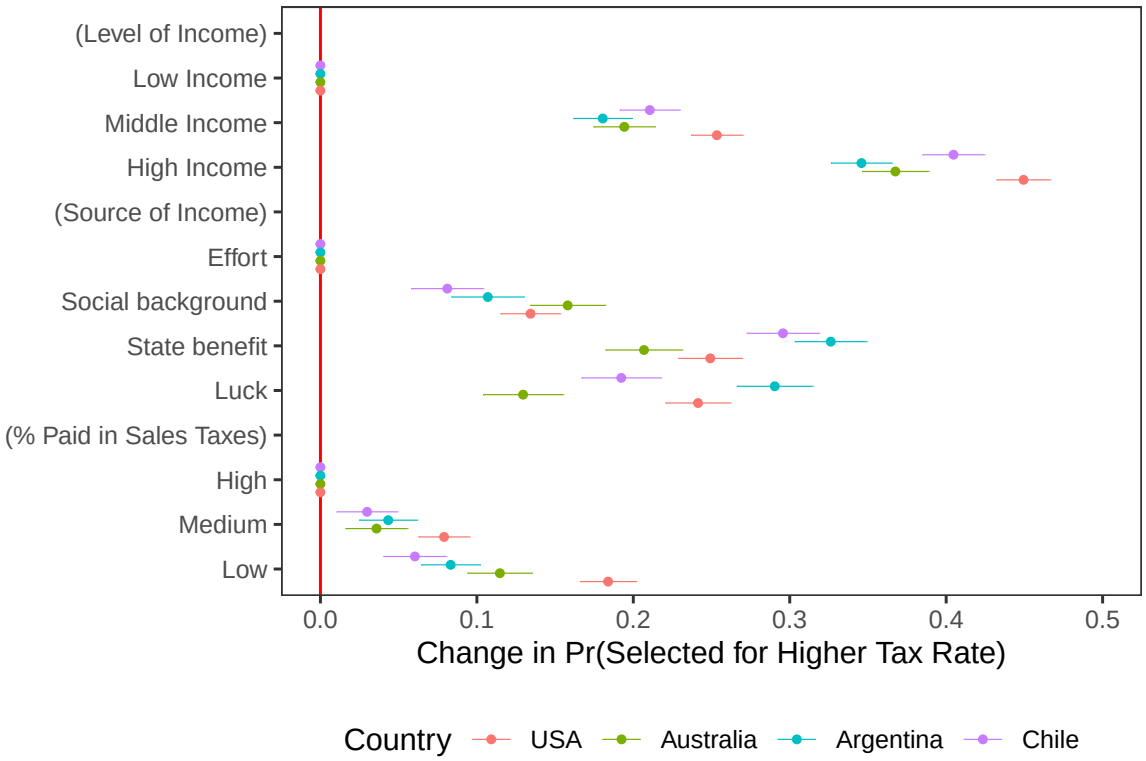
Figure A.7: Marginal Mean Outcomes by Equal Treatment Beliefs



Note: Plots show marginal mean outcomes from forced choice conjoint experiment, estimated separately for two different groups of respondents: those who think everyone should pay the same share of their income in taxes, and those who think some people should pay more than others. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

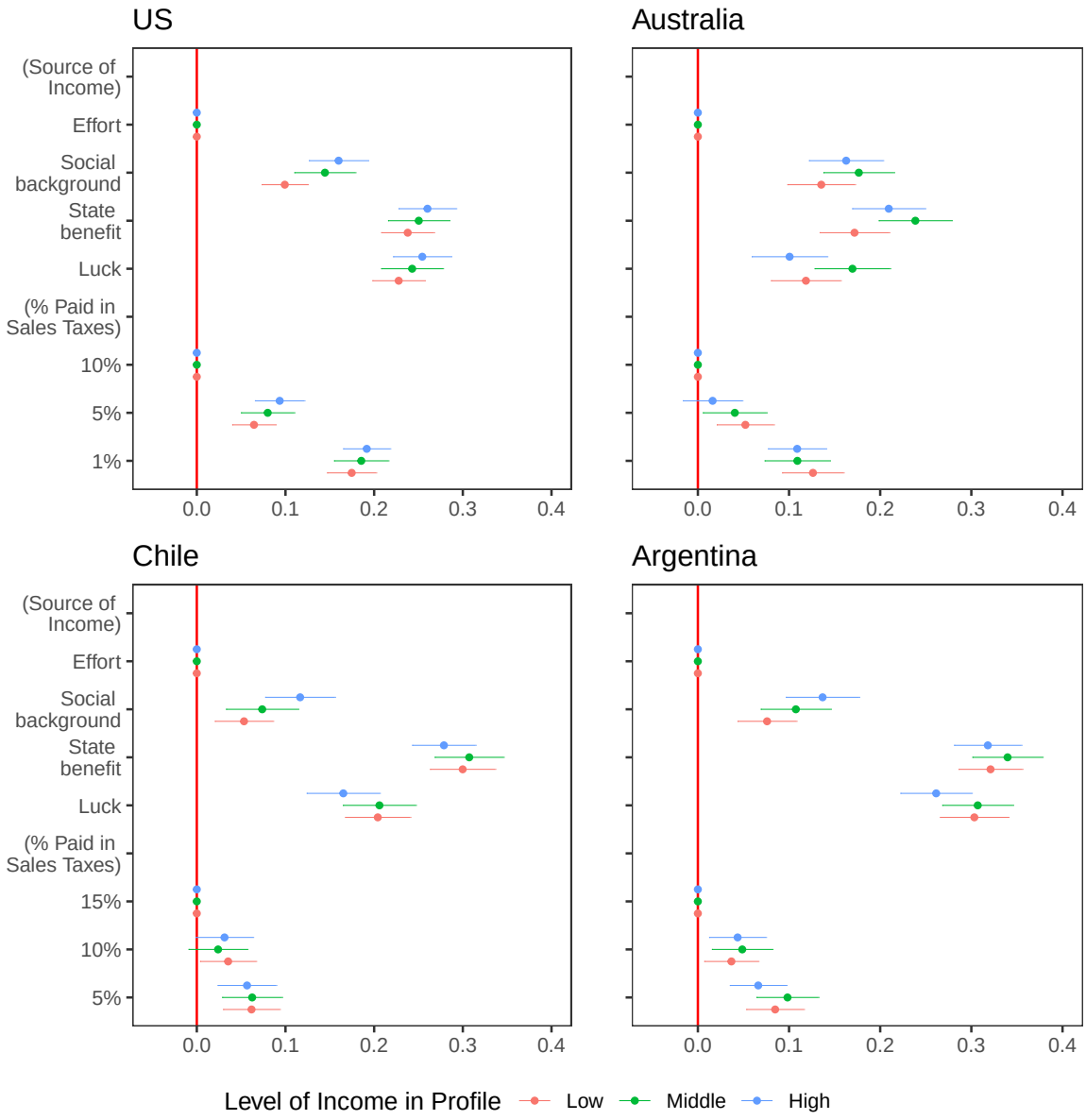
A.6 Average Marginal Component Effects

Figure A.8: AMCEs by Country



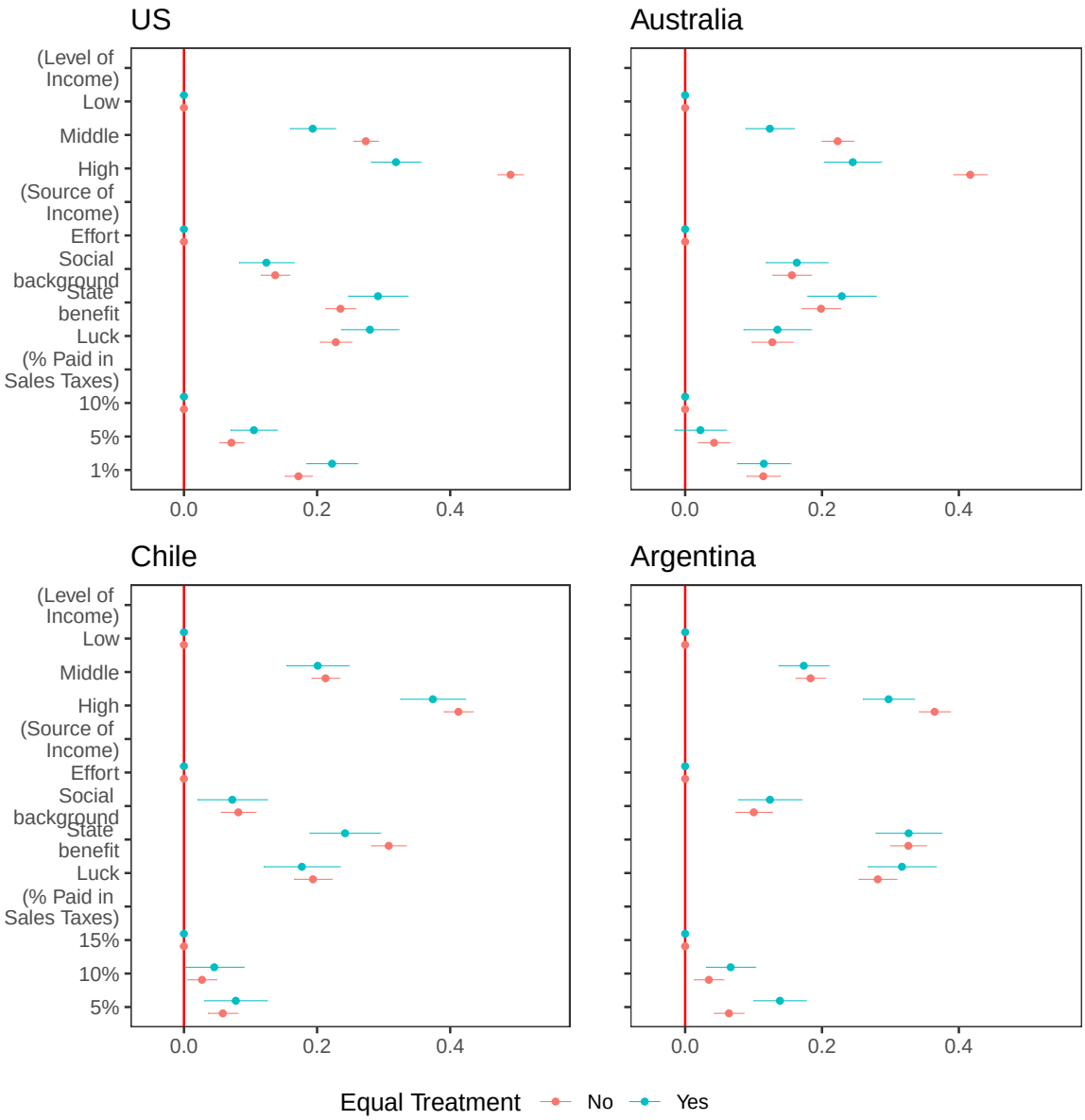
Note: This plot shows estimates of the effects of the randomly assigned individual attributes on the probability of being selected to receive the higher tax rate by country. Estimates are based on OLS model with robust standard errors clustered by respondent. Bars represent 95% confidence intervals. The points without horizontal bars denote the attribute level that is the reference category for each attribute. Attribute levels with the lowest probability of selection are chosen as reference categories for each attribute.

Figure A.9: Conditional AMCEs by Level of Income in Profile



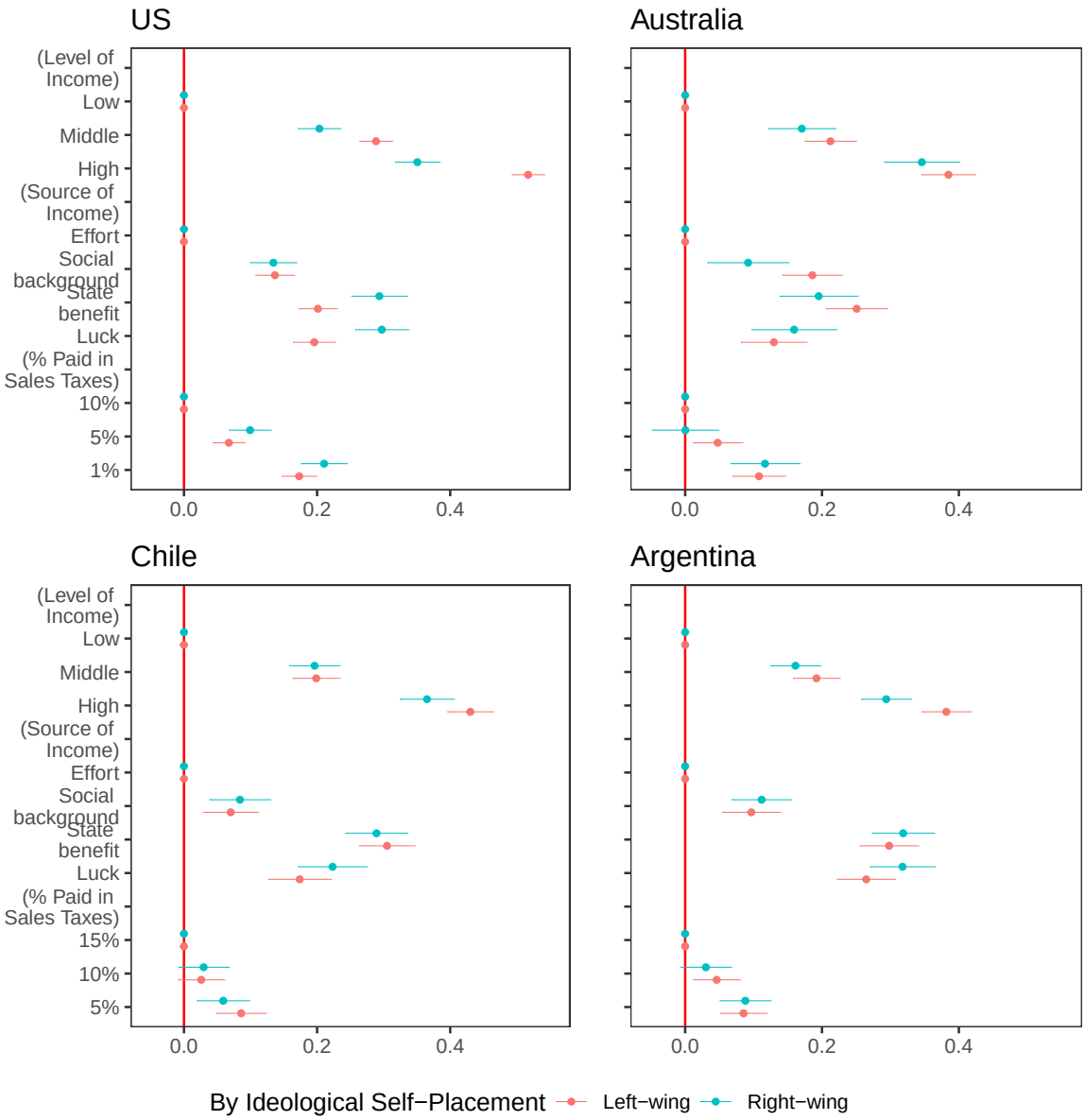
Note: This plot shows estimates of the effects of the randomly assigned individual attributes on the probability of being selected to receive the higher tax rate, by country. Estimates are based on OLS model with robust standard errors clustered by respondent, estimated separately for profiles with different levels of income. Bars represent 95% confidence intervals. The points without horizontal bars denote the attribute level that is the reference category for each attribute.

Figure A.10: Conditional AMCEs by Equal Treatment Beliefs



Note: This plot shows estimates of the effects of the randomly assigned individual attributes on the probability of being selected to receive the higher tax rate, by country. Estimates are based on OLS model with robust standard errors clustered by respondent, estimated separately for two groups of respondents: those who think everyone should pay the same share of their income in taxes and those who think some people should pay more than others. Bars represent 95% confidence intervals. The points without horizontal bars denote the attribute level that is the reference category for each attribute.

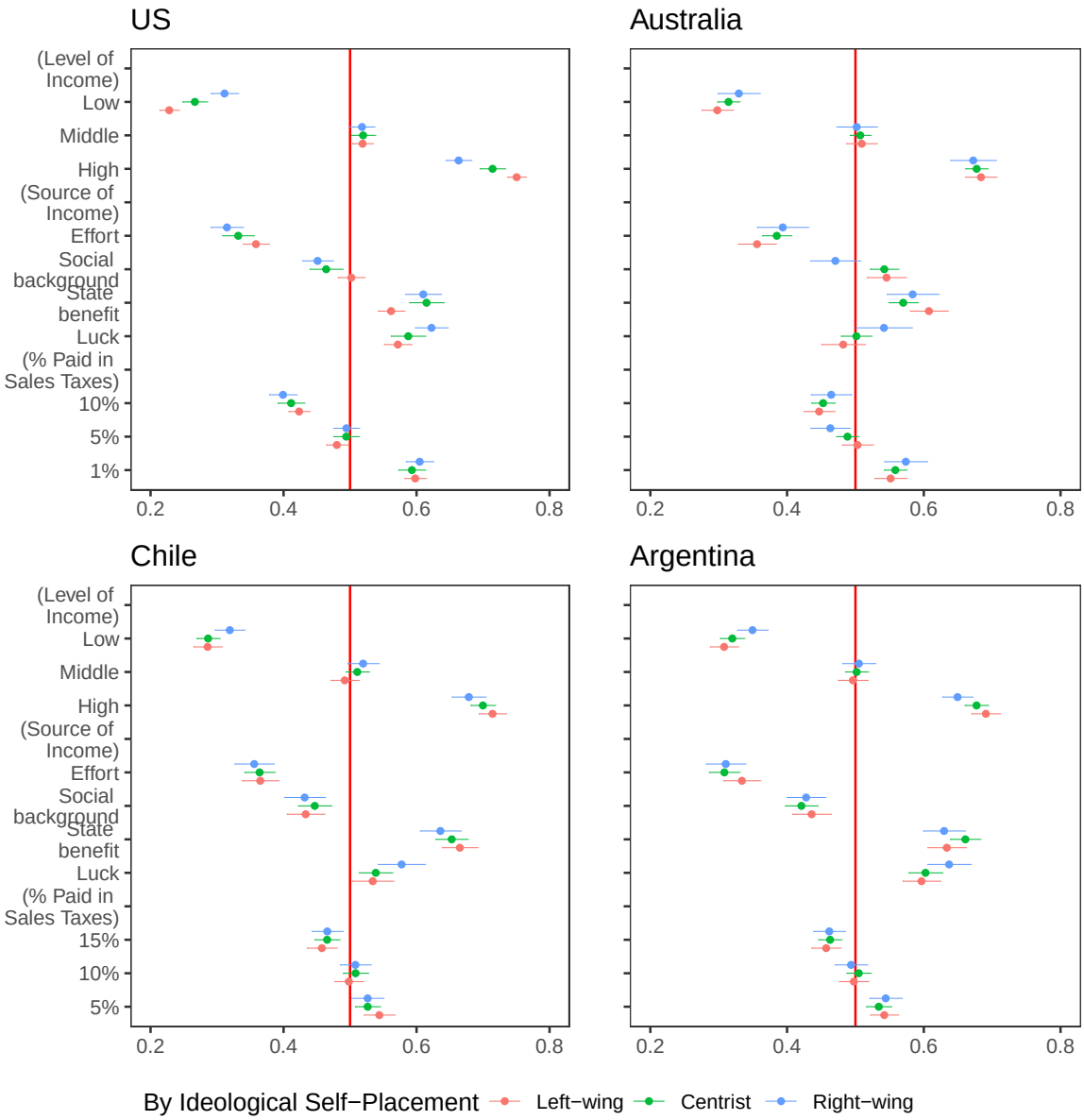
Figure A.11: Conditional AMCEs by Respondent Ideological Self-Placement



Note: This plot shows estimates of the effects of the randomly assigned individual attributes on the probability of being selected to receive the higher tax rate, by country. Estimates are based on OLS model with robust standard errors clustered by respondent, estimated separately for two different groups of respondents: those who consider themselves to be left or center-left and those who consider themselves to be right or center-right. Bars represent 95% confidence intervals. The points without horizontal bars denote the attribute level that is the reference category for each attribute.

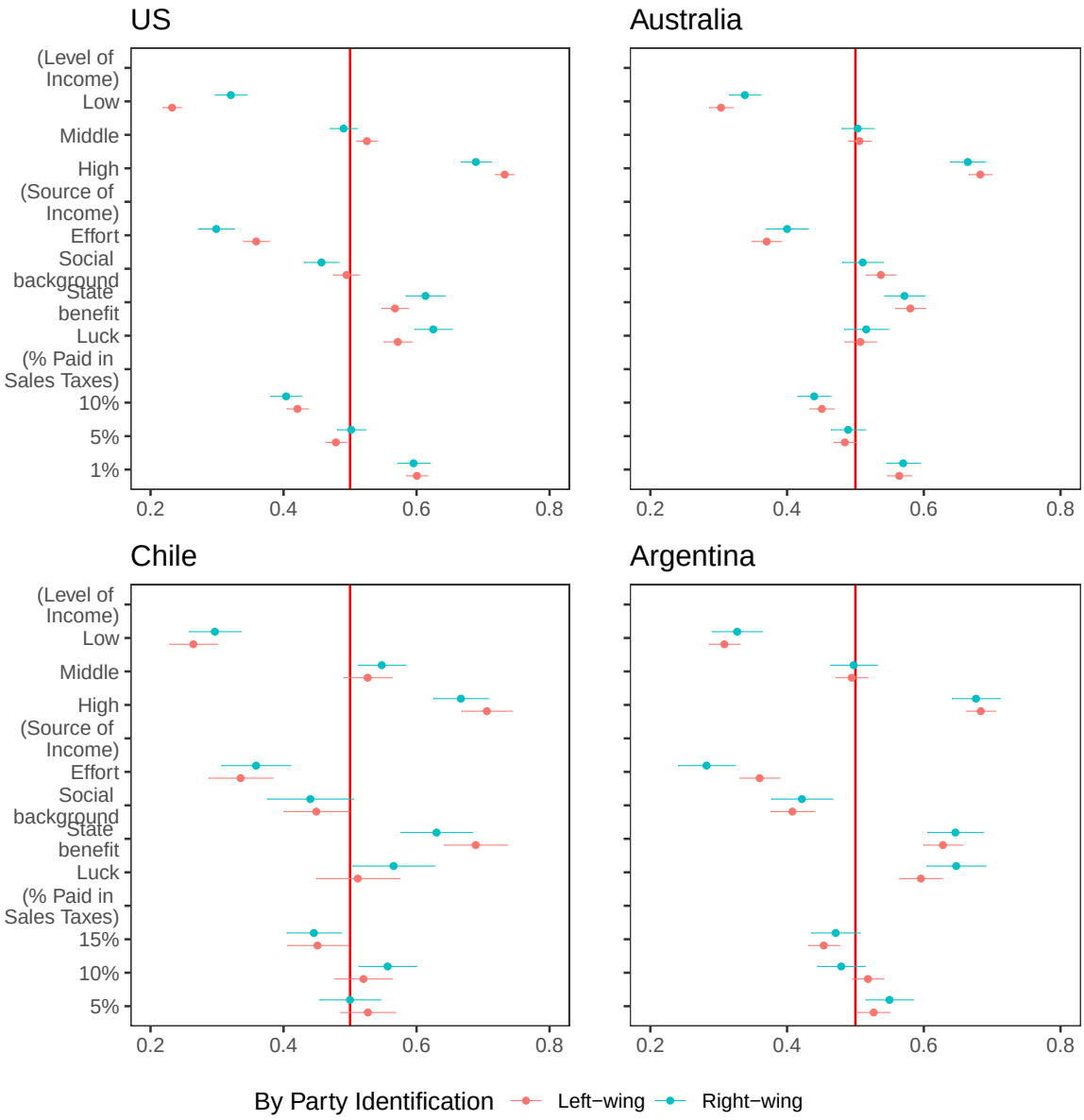
A.7 Marginal Means by Alternative Measures of Respondent Ideology

Figure A.12: Marginal Mean Outcomes by Respondent Ideological Self-Placement



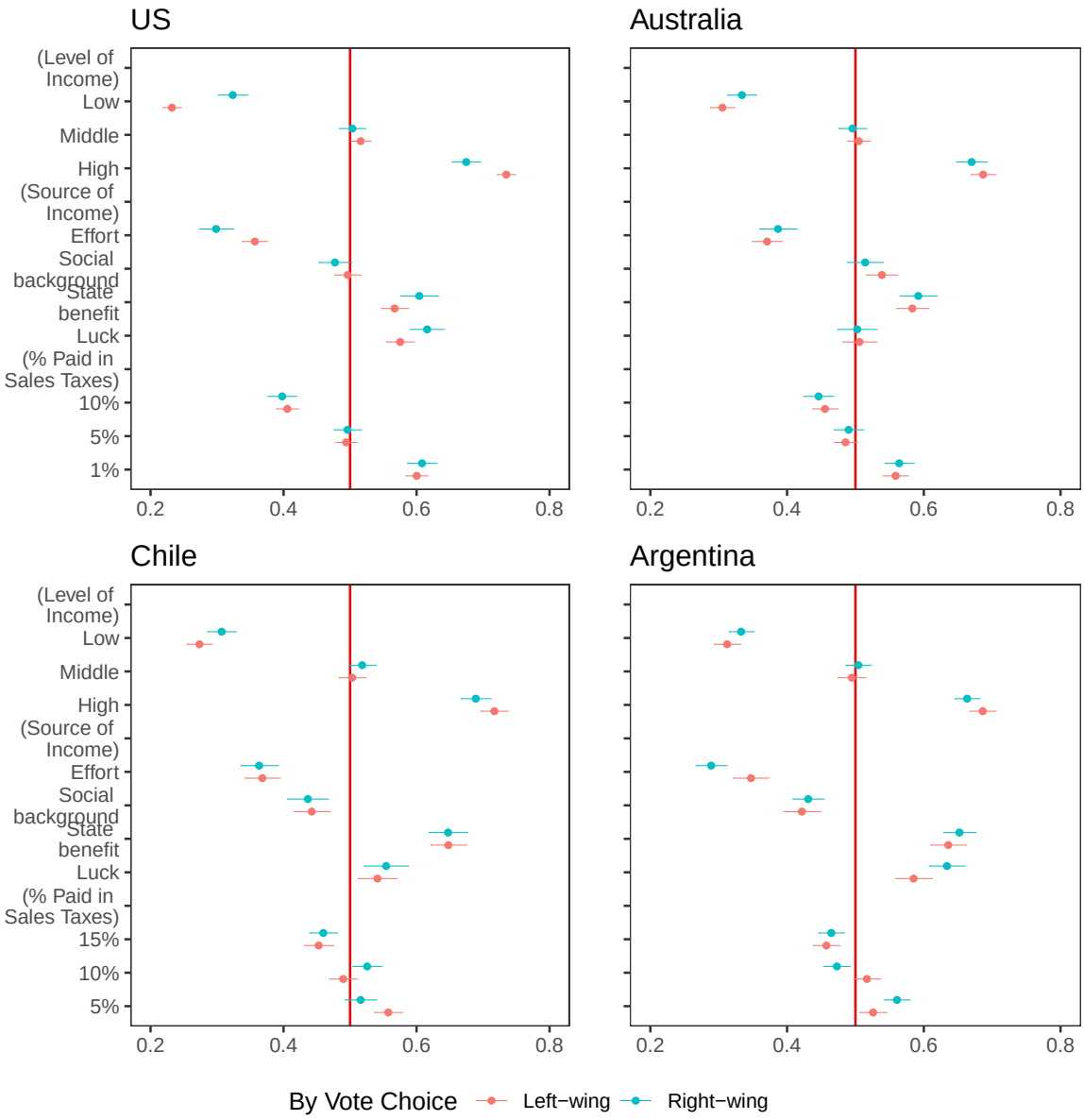
Note: Plots show marginal mean outcomes from forced-choice conjoint experiment, estimated separately for three groups of respondents: those who consider themselves to be left or center-left, center and right or center-right. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure A.13: Marginal Mean Outcomes by Respondent Party Identification



Note: Plots show marginal mean outcomes from forced-choice conjoint experiment, estimated separately for two groups of respondents: those who identify with left or center-left parties, and those who identify with right or center-right parties. Those identifying with center parties, other parties or as independents are excluded. See tables 4-7 for party codings by country. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure A.14: Marginal Mean Outcomes by Respondent Vote Choice



Note: Plots show marginal mean outcomes from forced-choice conjoint experiment, estimated separately for two groups of respondents: those who in the last general election voted for left or center-left parties, and those who voted for right or center-right parties. Those who voted for center parties, other parties or did not vote are excluded. See tables 4-7 for party codings by country. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Table A.3: Party Coding: Argentina

Ideology	**Party identification**	**Vote choice**
Left	Partido Justicialista	Alberto Fernandez (Frente de Todos)
	Kirchnerismo	Nicolas del Cano (Frente de Izquierda)
	Partido Socialista	
Right	Union Civica Radical	Mauricio Macri (Juntos por el Cambio)
	Propuesta Republicana	Juan Jose Gomez (Frente NOS)
		Jose Luis Espert (Unite por la Libertad y la Dignidad)
Excluded	Other, None	Roberto Lavagna (Consenso Federal)
		Other, Did not vote

Note: The survey question used to capture party identification was: "Generally speaking, which party or political organization do you most identify with?". The survey question used to capture vote choice was: "Who did you vote for president in the 2019 presidential elections?".

Table A.4: Party Coding: Chile

Ideology	**Party identification**	**Vote choice**
Left	Partido Socialista de Chile (PS)	Alejandro Guillier (La Fuerza de la Mayoria)
	Partido Radical Socialdemocrata (PRSD)	Beatriz Sanchez (Frente Amplio)
	Partido por la Democracia (PPD)	Marco Enriquez Ominami (PRO)
	Partido Comunista de Chile (PC)	Eduardo Artes (UPA)
	Revolucion Democratica (RD)	Alejandro Navarro (Pais)
Right	Union Democrata Independiente (UDI)	Sebastian Pinera (Chile Vamos)
	Renovacion Nacional (RN)	Jose Antonio Kast (Independiente)
	Partido Evolucion Politica (EVOPOLI)	
Excluded	Partido Democrata Cristiano (PDC)	Carolina Goic (PDC)
	Other, None	Other, Did not vote

Note: The survey question used to capture party identification was: "Generally speaking, which party or political organization do you most identify with?". The survey question used to capture vote choice was: "Who did you vote for president in the first round of the 2017 presidential elections?".

Table A.5: Party Coding: Australia

Ideology	**Party identification**	**Vote choice**
Left	Labor	Australian Labor Party
	Greens	Australian Greens
Right	Liberal	Liberal Party of Australia
	National Party	National Party of Australia
		Liberal National Party of Queensland
		United Australia Party
		One Nation
Excluded	Independent, Other	Other, Did not vote

Note: The survey question used to capture party identification was: "Generally speaking, do you usually think of yourself as...". The survey question used to capture vote choice was: "If you voted in the May 2019 Federal election, which party got your first preference in the House of Representatives?".

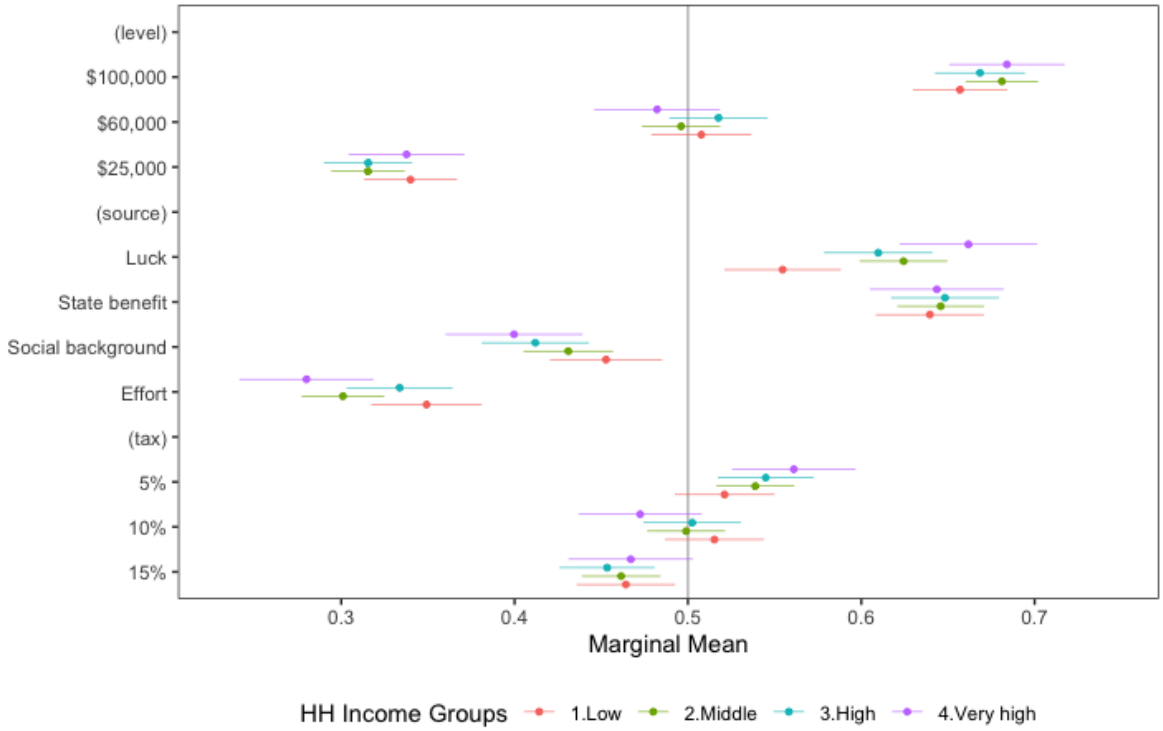
Table A.6: Party Coding: U.S.

Ideology	**Party identification**	**Vote choice**
Left	Democrat	Hillary Clinton
Right	Republican	Donald Trump
Excluded	Independent, Other	Other, Did not vote

Note: The survey question used to capture party identification was: "Generally speaking, do you usually think of yourself as...". The survey question used to capture vote choice was: "If you voted in the 2016 presidential election, who did you vote for?".

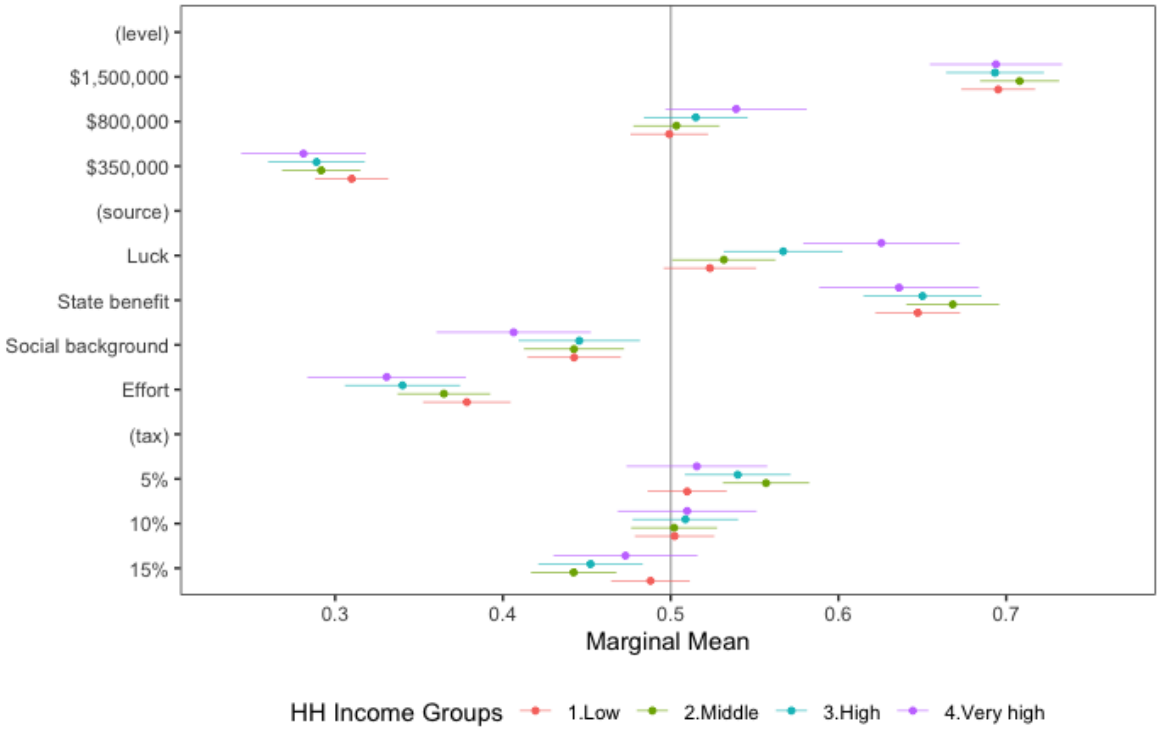
A.8 Marginal Means by Respondent Income Level

Figure A.15: MMs by Respondent Income Level: Argentina



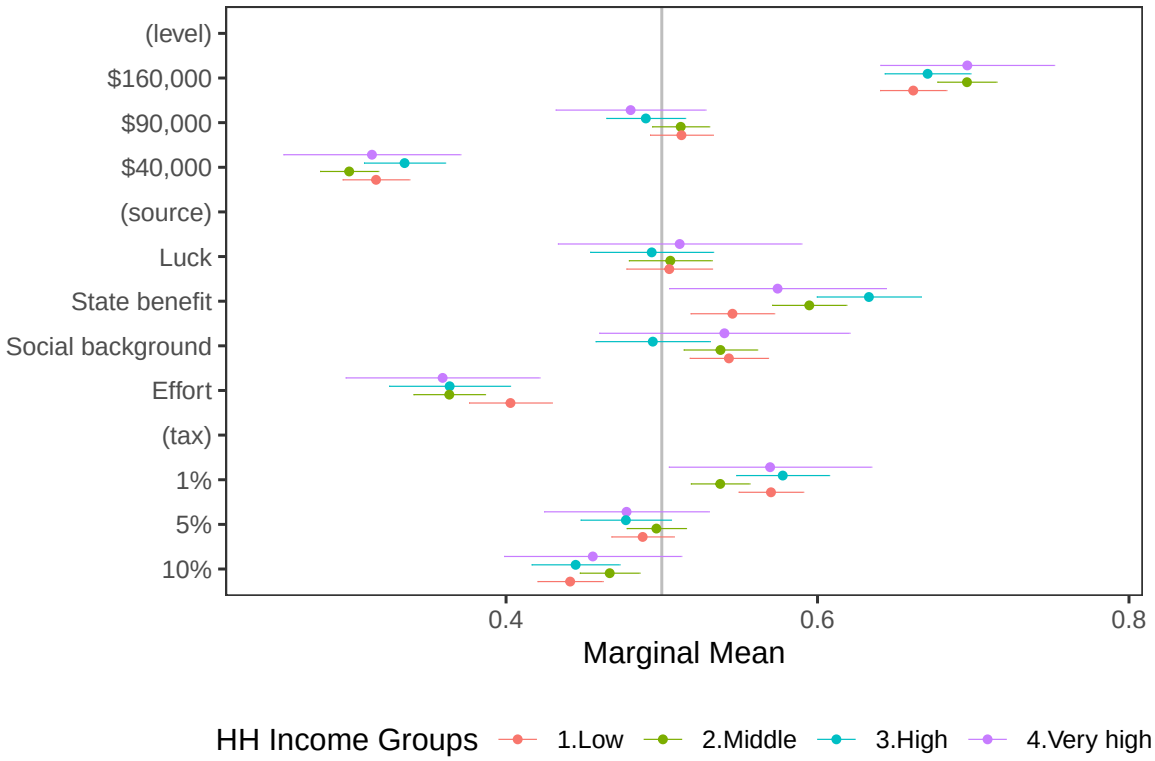
Note: This plot shows marginal mean outcomes from forced choice conjoint experiments, by respondent income level in Argentina. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure A.16: MMs by Respondent Income Level: Chile



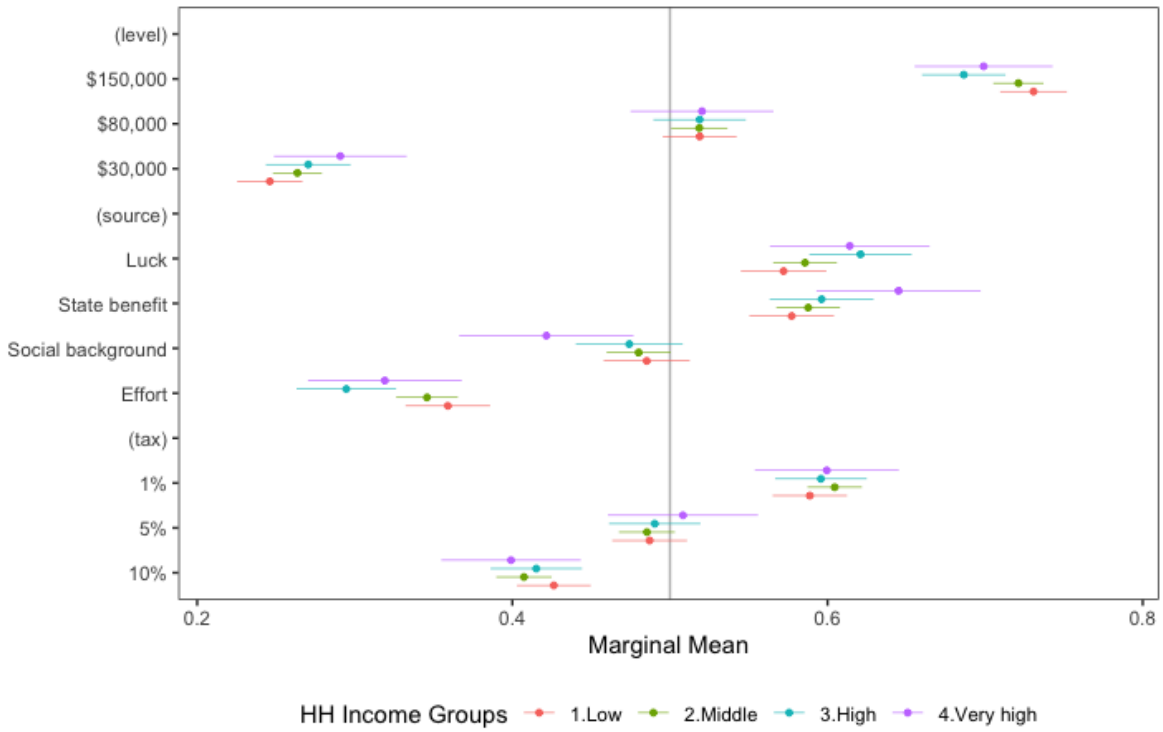
Note: This plot shows marginal mean outcomes from forced choice conjoint experiments, by respondent income level in Chile. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure A.17: MMs by Respondent Income Level: Australia



Note: This plot shows marginal mean outcomes from forced choice conjoint experiments, by respondent income level in Australia. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

Figure A.18: MMs by Respondent Income Level: U.S.



Note: This plot shows marginal mean outcomes from forced choice conjoint experiments, by respondent income level in the U.S. Estimates are unweighted and clustered by respondent. Bars represent 95% confidence intervals.

A.9 Estimating Population Average Marginal Component Effects

Recent research has highlighted the drawbacks of using the uniform distribution to randomize conjoint profiles, noting that target distributions of interest are often far from uniform (De la Cuesta, Egami and Imai 2019). As a result, the external validity of conjoint estimates may be seriously compromised, particularly when there are interactions between attributes and the real-world distribution is far from uniform, both conditions that apply here. In order to assess the robustness of my results to using alternative profile distributions, I conducted model-based exploratory analyses using real-world marginal distributions for the level of income and share of income paid in sales tax attributes. Since there are no obvious real-world distributions to inform source of income probabilities, I maintained the uniform distribution for this attribute. Table A.7 describes the probabilities used for each attribute level and country, table A.8 the data sources used to determine them and figures A.19 to A.22 the uniform and population AMCEs for each country. As we can see, despite the fact that target distributions differ considerably from the uniform, results are remarkably robust, bolstering confidence in their external validity.

Table A.7: Attribute Levels and Target Probabilities by Country

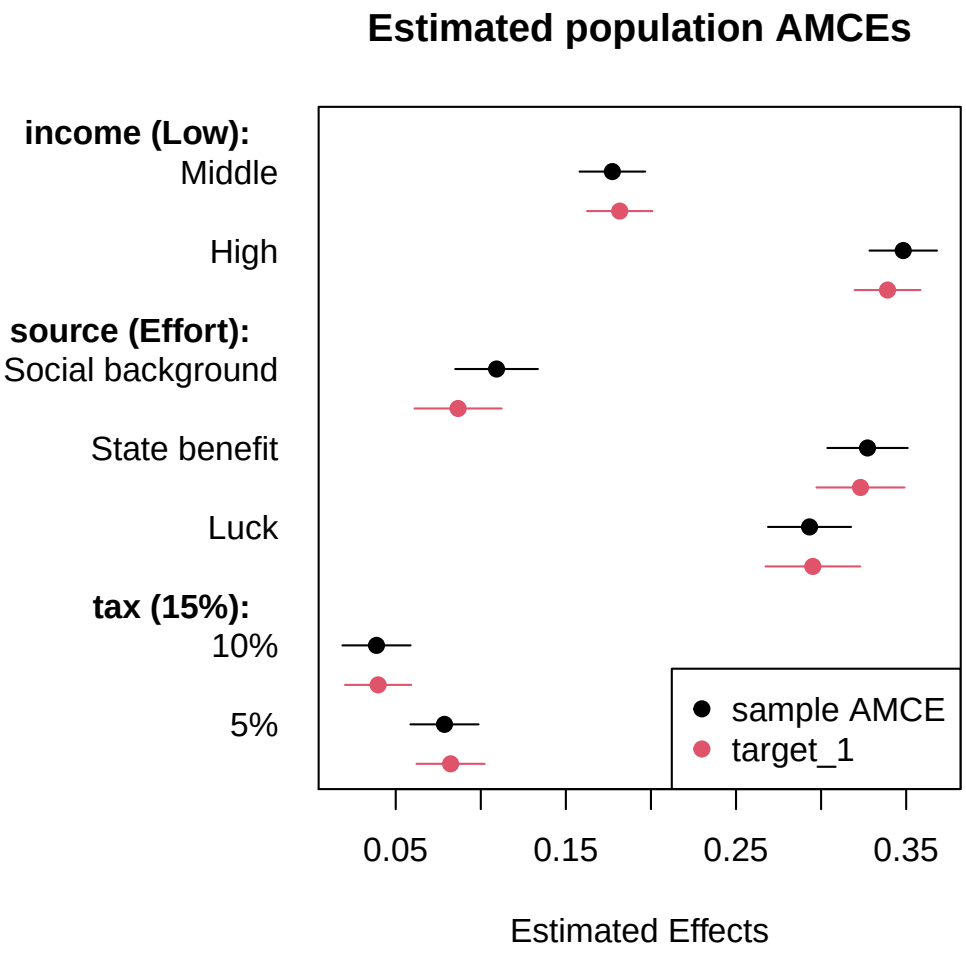
Attribute Levels	**Probabilities**			
	Argentina	**Chile**	**Australia**	**U.S.**
Level of income				
Low	0.625	0.575	0.6	0.6
Middle	0.275	0.275	0.275	0.275
High	0.1	0.15	0.125	0.125
Source of income				
Effort	0.25	0.25	0.25	0.25
Social Background	0.25	0.25	0.25	0.25
State Benefit	0.25	0.25	0.25	0.25
Luck	0.25	0.25	0.25	0.25
% of income paid in sales taxes				
Low	0.3	0.1	0.05	0.05
Medium	0.6	0.6	0.55	0.55
High	0.1	0.3	0.4	0.4

Note: See table A.8 for data sources used to define probabilities.

Table A.8: Population Data Sources by Country

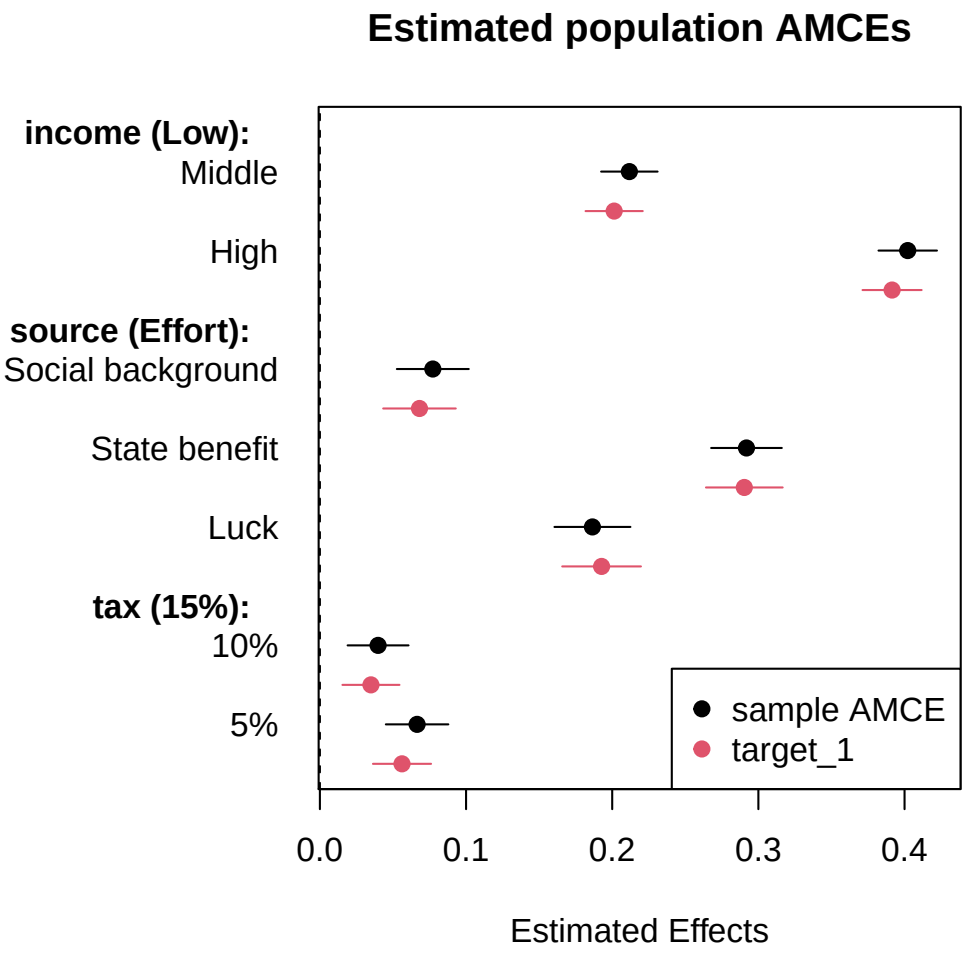
Country	**Attributes**	
	Share of Income paid in Sales Taxes	**Level of Income**
Argentina	Abeles, Balasini and Panigo (2012)	Encuesta Permanente de Hogares 2019
Chile	OECD and KIPF (2014)	Encuesta CASEN 2017
Australia	Phillips and Taylor (2015)	Survey of Income and Housing 2017-18
U.S.	Wiehe et al. (2018)	Current Population Survey 2017

Figure A.19: Argentina



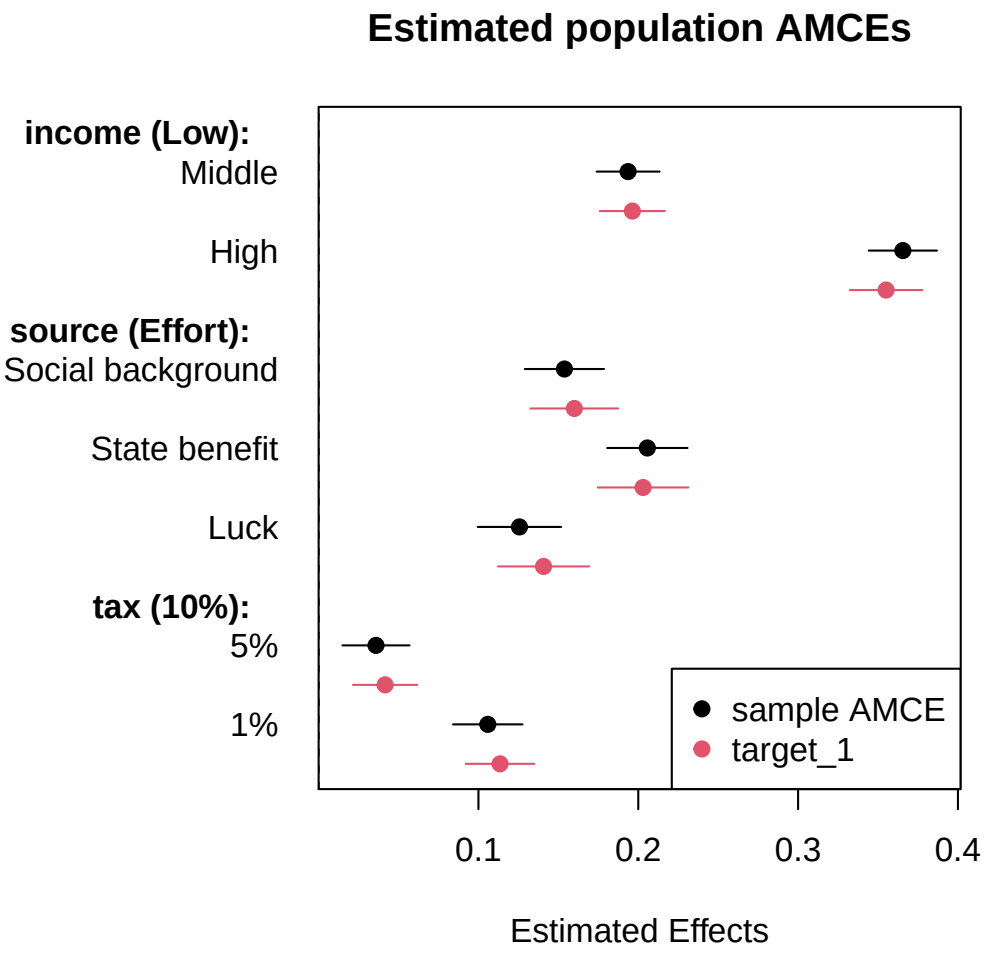
Note: This plot shows estimated population (red) and uniform (black) AMCEs for Argentina. pAMCEs are estimated using a linear probability model and the probabilities described in table A.7. Estimates are clustered by respondent. Bars represent 95% confidence intervals.

Figure A.20: Chile



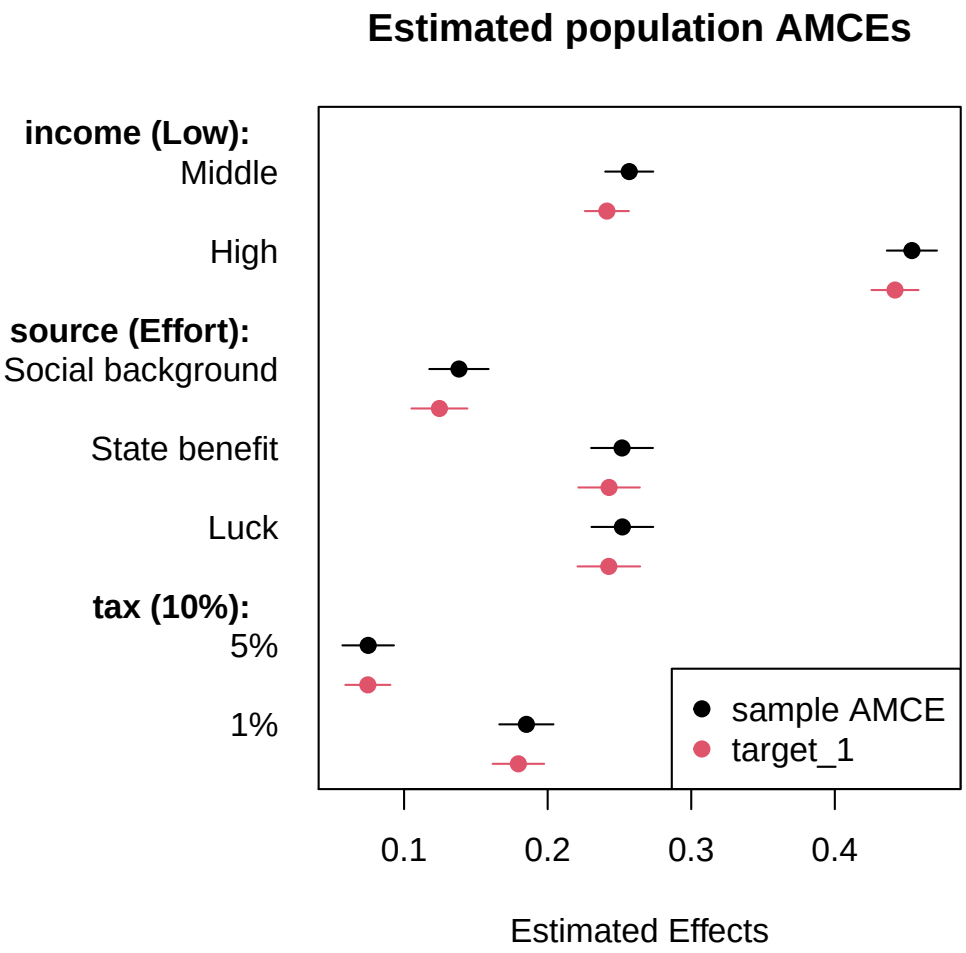
Note: This plot shows estimated population (red) and uniform (black) AMCEs for Chile. pAMCEs are estimated using a linear probability model and the probabilities described in table A.7. Estimates are clustered by respondent. Bars represent 95% confidence intervals.

Figure A.21: Australia



Note: This plot shows estimated population (red) and uniform (black) AMCEs for Australia pAMCEs are estimated using a linear probability model and the probabilities described in table A.7. Estimates are clustered by respondent. Bars represent 95% confidence intervals.

Figure A.22: U.S.



Note: This plot shows estimated population (red) and uniform (black) AMCEs for the U.S. pAMCEs are estimated using a linear probability model and the probabilities described in table A.7. Estimates are clustered by respondent. Bars represent 95% confidence intervals.