

**Lay Beliefs about Changes in Financial Well-being
Predict Political and Policy Message Preferences**

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Abstract

People differ in their beliefs about how and why the financial well-being of individuals changes over time. We find that these lay theories can be reliably described along three independent dimensions, respectively capturing the extent to which changes in financial well-being are perceived to be: (1) knowable and within individuals' control due to individual factors such as effort ("Rewarding"); (2) knowable and outside of individuals' control due to systemic factors such as favoritism and discrimination ("Rigged"); and (3) inherently unpredictable and determined by chance events ("Random"). We develop a scale of the Rewarding, Rigged, and Random dimensions of beliefs concerning changes in financial well-being. To validate our scale, we recruited a demographically representative sample of U.S. participants ($N = 1102$) and find that differences in these beliefs are associated with political ideology, revealing a predicted pattern: conservatives scored higher on the Rewarding subscale and liberals scored higher on the Rigged and Random subscales, even when controlling for key demographics. Moreover, we find that these three dimensions predict responses to different policy messages when controlling for political ideology. In three preregistered experiments (combined $N = 2560$), we observe increased support for social welfare policies when we highlighted aspects of these policies that are compatible with people's beliefs about financial well-being. Likewise, we observe increased support for political candidates when they expressed their positions in a way that is compatible with people's beliefs. Thus, this work can help better understand drivers of political attitudes and guide in crafting more persuasive policy messaging.

Keywords: uncertainty, redistribution, inequality, persuasion, political attitudes

Lay Beliefs about Changes in Financial Well-being Predict Political and Policy Message Preferences

Economic inequality is on the rise around the globe (Alvaredo et al., 2018; Piketty & Saez, 2014; Saez & Zucman, 2016; Zucman, 2019). The issue has become a top priority in politics, and many politicians are seeking ways to garner broad support for proposals designed to address inequality. This is not an easy task. Although people show a surprising degree of consensus in their preference for a more equal society (Kiatpongsan & Norton, 2014; Norton & Ariely, 2011), they often disagree on when, why, and how the government should intervene through social welfare policies. Such disagreements may arise in part because people vary in their beliefs about what causes differences in financial well-being. For instance, surveys suggest that people's political and policy attitudes may be influenced by the extent to which they think that poverty or wealth is caused by structural, individualistic, or fatalistic factors (Bobbio et al., 2010; Bullock et al., 2003; Cozzarelli et al., 2001; Feagin, 1972; Feather, 1974; Furnham, 1982a, 1982b; Henry et al., 2004; Kluegel & Smith, 1986; Lepianka et al., 2009; Sahar, 2014; Weiner et al., 2011; Zucker & Weiner, 1993).

Changes in economic conditions and voters' beliefs about the ability of politicians to manage these conditions are pivotal factors determining the outcomes of elections (Kinder & Kiewiet, 1979; Lewis-Beck & Stegmaier, 2000; Sides et al., 2017; Vavreck, 2014). To successfully persuade voters, campaigns must therefore speak not only to objective economic indicators that reflect citizens' financial well-being—such as unemployment and wage growth—but also to voters' subjective beliefs about factors that drive changes and/or individual differences in financial well-being. Beyond this, policy preferences among different audiences can be shaped by how a policy is labeled or characterized. For instance, one study found that

political conservatives (but not liberals) find a policy labeled “carbon offset” more appealing than an equivalent “carbon tax,” because the latter has particularly negative associations for conservatives (Hardisty et al., 2010).

In this article, we propose that a person’s beliefs about changes in financial well-being predict not only overall political preferences but also responses to different social welfare policy messages, even when controlling for political ideology and other demographics. We define financial well-being as the capacity to meet financial obligations and the financial freedom to make the choices that allow one to enjoy life (adapted from CFPB, 2015). We show that lay theories about changes in financial well-being vary along three conceptually and statistically independent dimensions. The *Rewarding* dimension captures the extent to which people attribute changes in financial well-being to predictable meritocratic factors such as a person’s level of effort, skill, and resourcefulness. The *Rigged* dimension captures the extent to which people attribute changes in financial well-being to predictable distorting factors that are beyond the control of the individual, such as discrimination and favoritism. Finally, the *Random* dimension captures the extent to which people attribute changes in financial well-being to chance factors, including seemingly unpredictable life events, such as becoming disabled from an accident or winning the lottery.

Distinguishing lay beliefs about uncertainty in financial well-being can help us understand what drives disagreements concerning social welfare policy. Moreover, it can help us understand how and why different policy messages appeal to different groups. Individuals who would normally disagree politically may be persuaded to favor the same social welfare policy or political candidate, if only the arguments used in favor of the policy or candidate are aligned with the beliefs that the individuals hold about changes in financial well-being. Before

developing our hypotheses in more detail, we next explain how our approach synthesizes two research streams: one that examines the relationship between perceived fairness and control, and one that examines dimensions of subjective uncertainty.

Fair Allocations and Control

Forming preferences for social welfare policies requires an assessment of the fairness of the status quo distribution. People are not averse to unequal allocations per se, but rather to inequalities that they perceive to be unfair (Starmans et al., 2017; Trump, 2020). When asked whether a given allocation warrants a form of intervention (i.e., redistribution), people are often thought to rely on the *accountability principle*, which states that “a person’s fair allocation (e.g., of income) varies in proportion to the relevant variables that he can influence (e.g., work effort) but not according to those that he cannot reasonably influence (e.g., a physical handicap)” (Konow, 2000, p. 1073). A judgment of whether the allocation of outcomes in a situation is acceptable should thus involve an assessment of the degree of individual control over the situation.

The accountability principle has been amply demonstrated in studies of economic games in the laboratory. For instance, Oxoby and Spraggon (2008) found that participants allocated more money to others (i.e., they redistributed more wealth) when the initial amount of available wealth was determined at random than when it was determined by the number of correct answers in a test. Similar results have been observed in other incentive-compatible laboratory experiments and vignette studies, involving both redistribution decisions that were made both by stakeholders and by impartial spectators (Cappelen et al., 2007; Cappelen et al., 2013; Chavanne, 2018; Konow, 2000; Krawczyk, 2010).

While experimental games offer a crisp demonstration of the impact of control on distributional preferences, the precise mechanisms determining economic allocations outside the laboratory are typically unknown and therefore more open to interpretation. People may reasonably differ in the extent to which they believe allocations are driven by factors under the influence of the individual (i.e., discretionary variables) versus those that are not (i.e., exogenous variables; Konow, 1996, 2000). For instance, data from the World Values Survey gathered between 1983 and 1997 documents a sharp contrast between how people in Europe and people in the United States thought about poverty: 54% of Europeans believed that luck determines income, versus 30% of Americans; meanwhile, 26% of Europeans believed that the poor are lazy, versus 60% of Americans (Alesina & Glaeser, 2004; Alesina et al., 2001). Cross-national differences in beliefs about a larger role of luck and smaller role of effort in causing poverty predict stronger support for more progressive redistribution policies and higher welfare spending (Alesina & Angeletos, 2005; Alesina & Glaeser, 2004; Alesina & La Ferrara, 2005; Almås et al., 2020; Fong, 2001; Piff et al., 2020).

Subjective Dimensions of Uncertainty

Preferences for social welfare policies also require an assessment of how financial well-being will change over time, a judgment under uncertainty. Recent research has identified two dimensions of uncertainty that people intuitively distinguish: epistemicness, or the extent to which uncertainty is seen as inherently knowable, and aleatoriness, or the extent to which uncertainty is seen as inherently random (Fox & Ülkümen, 2011; Tannenbaum et al., 2016; Ülkümen et al., 2016). For instance, most people would judge the correct answer to a trivia question as purely epistemic (i.e., knowable), whereas they would see the outcome of a future coin flip as purely aleatory (i.e., random). More generally, different people may perceive

different degrees of both epistemicness and aleatoriness in uncertain events—for instance, one person may see the outcome of a basketball game as both more knowable in advance and determined more by random factors than another person.

A number of recent studies have documented the importance of the epistemic-aleatory distinction to a variety of behaviors. For instance, people acting as managers assign a greater proportion of compensation to performance-based incentives the more epistemic they see a task and they prefer longer evaluation windows the more aleatory they see a task (Fox, Tannenbaum et al., 2020). In other research, perceived nature of uncertainty has been found to predict the language that people use to communicate their uncertainty (Ülkümen et al., 2016), the extremity and accuracy of probability judgments (Tannenbaum et al., 2016), stock market investment behaviors (Walters et al., 2020) and willingness to bet under conditions of uncertainty or ambiguity (Fox, Goedde-Menke et al., 2020). This framework may be especially germane to the question of social welfare policy preferences because it distinguishes two qualitatively distinct ways in which changes in financial well-being can be out of one's control: in inherently predictable ways and/or random ways.

Synthesizing Literatures

To clarify the importance of distinguishing knowable from random factors for allocation and redistribution preferences, let us consider the following example. Suppose that Alex and Ben are both late paying their rent this month. Alex lost his job because the factory in which he worked was destroyed by a tornado. Ben lost his job because his supervisor replaced him after learning he was Muslim. Most people would agree that Alex and Ben both experienced financial hardship for reasons largely outside of their control, and studies on allocation and redistribution preferences discussed above do not explicitly distinguish between these two cases. We assert,

however, that people may, in fact, make a critical distinction between the cases: Alex's inability to pay rent is the result of an exogenous factor that is seen as random (a natural disaster), whereas Ben's inability to pay rent is the result of an exogenous factor that is seen as systemic and thus more predictable in advance (discrimination). We expect that people may differ in the extent to which they see random versus knowable factors outside of one's control as common drivers of change in financial well-being, and that these factors may suggest distinct kinds of interventions and/or different rationale for redistributing resources.

Three Independent Dimensions of Beliefs about Changes in Financial Well-being

In this article, we hypothesize that people's lay theories concerning changes in financial well-being are best characterized along three dimensions: An epistemic-discretionary (i.e., rewarding) dimension, capturing the degree to which changes in financial well-being are attributed to the individual's own actions and capabilities; an epistemic-exogenous (i.e., rigged) dimension, capturing the degree to which changes in financial well-being are attributed to knowable factors outside of the individual's control, such as discrimination and favoritism; and an aleatory-exogenous (i.e., random) dimension, capturing the degree to which changes in financial well-being are attributed to inherently unpredictable factors outside of the individual's control. See Table 1 for an overview of these three dimensions.

In the framework we propose, we treat Rewarding, Rigged, and Random as conceptually independent dimensions (henceforth capitalized to avoid confusion with their generic equivalents). This conceptual independence provides flexibility and accuracy in capturing the different lay theories that people may have about changes in financial well-being. In past research, perceived individual control was typically treated as a single dimension, with luck (i.e., lack of control) and effort/ability (i.e., control) being on opposite ends and therefore mutually

exclusive. In contrast, our proposed model allows for the possibility that an individual may perceive the system to be highly Rewarding, highly Rigged, and highly Random at the same time, or that their beliefs may vary in any combination along these three dimensions.

Table 1

Overview of the Rewarding, Rigged, and Random dimension

Dimension	Nature of uncertainty	Causal attribution	Changes in financial well-being perceived as...	Changes in financial well-being are determined by...	Compatible policy argument
Rewarding	Epistemic	Discretionary	Knowable and within control of the individual	...individual factors, such as: - ability/talent - level of effort	Incentivizing
Rigged	Epistemic	Exogenous	Knowable and not within control of the individual	...systemic factors, such as: - discrimination/favoritism - initial status	Redistribution
Random	Aleatory	Exogenous	Random and not within control of the individual	...chance events, such as: - accidents/natural disasters - lottery windfalls/serendipity	Risk-pooling

Social Welfare Policy Preferences and Persuasive Messaging

Governments have many different social welfare policy tools at their disposal. In practice, the same social welfare policy can be described in various ways, emphasizing different interpretations of the purpose of the policy. Consider a politician who proposes introducing a system for publicly-funded health care. Such a system can serve a redistributive purpose, by using the revenue from a progressive income tax to subsidize the cost of health care for the poor. At the same time, the system may function as social insurance, by pooling the risk of unforeseen health care costs among all people. Finally, there may be restrictions built into the system, with

the intention of incentivizing desirable behavior and/or deter people from taking advantage of others—for instance if coverage is made conditional on work requirements.

Because social welfare policies are often a mixture of these (and possibly other) elements, politicians and policymakers who want to persuade the public have a choice to make: which element(s) to highlight when arguing in favor of a policy? We propose that policies and policymakers will be viewed more favorably by an observer to the extent that a policy's description is more compatible with the observer's lay theory concerning how financial well-being changes over time. Past research has examined differences in beliefs about morality between liberals and conservatives as a starting point for crafting persuasive policy messages (Day et al., 2014; Feinberg & Willer, 2019). Messages that are compatible with beliefs about morality are more persuasive than messages that are incompatible with these beliefs (Feinberg & Willer, 2019; Kidwell et al., 2013; Lammers & Baldwin, 2018; Voelkel & Feinberg, 2018; Voelkel et al., 2020; Wolsko et al., 2016). We expect a similar association between beliefs about uncertainty in financial well-being and responses to different kinds of messages about social welfare policies, even when controlling for political ideology.

In particular, we hypothesize that people who score higher on the Rewarding dimension will be more supportive of a social welfare policy when tendency to motivate effort or resourcefulness is emphasized. Such an *Incentivizing* message stresses the need for welfare support to be made conditional on individual inputs in order to restrict assistance to the deserving and/or to motivate desirable behavior. Second, we hypothesize that people who score higher on the Rigged dimension will be more supportive of a social welfare policy when its goal of helping traditionally disadvantaged groups is emphasized. Such a *Redistribution* message focuses on repairing imbalance in society and may therefore be particularly attractive to people who believe

that changes in financial well-being are knowable and predictable because of systemic unfairness. Finally, we hypothesize that people who score higher on the Random dimension will be more supportive of a social welfare policy when it is characterized as a form of social insurance. Such a *Risk-pooling* message emphasizes how a policy is intended to collectively insure everyone against the risk of unforeseeable negative outcomes.

Overview of Studies

In this article we develop a measure of the Rewarding, Rigged, and Random dimensions of lay theories concerning changes in financial well-being. We then establish the predictive validity of this measure, by examining how the dimensions are associated with political ideology when taking into account the effect of demographic variables and other related psychological constructs (Study 1). Next, we leverage these insights to test our predictions that policy messages highlighting Incentivizing, Redistribution, and Risk-pooling are more persuasive to individuals with lay theories that are high on Rewarding, Rigged, and Random dimensions, respectively. In particular, we examine how beliefs about changes in financial well-being are associated with rated importance of different goals that a government may pursue (Study 2), the relative persuasiveness of messages that highlight these different goals for various social welfare policies (Study 3) and support for political candidates who speak about these different goals (Study 4)—all while controlling for differences in political ideology. For all of these studies we preregistered hypotheses, materials, sample size, inclusion criteria, and key analyses prior to data collection (see preregistrations for [Study 1](#), [Study 2](#), [Study 3](#), and [Study 4](#)).

Study 1

In our first study we develop a new scale measuring beliefs about changes in financial well-being. First, we test whether responses to this scale are captured by three conceptually and

statistically independent dimensions: Rewarding, Rigged, and Random. Importantly, we also examine whether the proposed Rewarding-Rigged-Random model (“RRR model”) fits the data better than three alternative models with fewer dimensions that follow from previous accounts in the literature (see Table 1). In particular we compare the RRR model to a two-dimensional epistemic-aleatory model (“EA model”) that distinguishes between a knowable dimension (i.e., Rewarding & not Rigged items as one dimension) and a random dimension (i.e., Random), a two-dimensional discretionary-exogenous model (“DE model”) that distinguishes between a dimension within the individual’s control (i.e., Rewarding) and a dimension beyond the individual’s control (i.e., Rigged & Random items as one dimension), and a unidimensional model (“Accountability model”) that encompasses all nine items as measures of degree of individual accountability (i.e., Rewarding & not Rigged & not Random items as a single dimension).

Second, to further validate our scale, we examine the extent to which the Rewarding, Rigged, and Random subscales are associated with political ideology, a variable that is widely used in earlier psychological research and that can serve as an initial indication for whether uncertainty beliefs are relevant for sensitivity to policy messaging. Liberals on the political left and conservatives on the right have often been described to differ in their openness to change, their preference for stability, and their acceptance of inequality (Hirsh et al., 2010; Jost, 2017; Jost et al., 2009; McCrae, 1996). According to Jost et al. (2003), conservative ideology is characterized in part by a need to “avoid change, disruption, and ambiguity (...) and to explain, order, and justify inequality among groups and individuals.” Conservatives and liberals also differ in their lay beliefs about free will; conservatives tend to believe that people have more autonomous control over their behavior (Carey & Paulhus, 2013; Everett et al., 2020). These

differences may be a reason why conservatives tend to favor internal causal attributions for outcomes in life. Conservatives are for instance more likely than liberals to believe that poverty is caused by a lack of effort (Zucker & Weiner, 1993) and to blame the poor for their own plight (Weiner et al., 2011).

Because conservatives, relative to liberals, are more likely to justify inequalities by holding the individual responsible for their actions and outcomes, we expect that conservatives will tend to see changes in financial well-being as more knowable in advance based on individual factors such as effort (i.e., more Rewarding). Meanwhile, we expect liberals to see these changes as both more knowable due to systemic factors such as discrimination and favoritism (i.e., more Rigged), and as more inherently unpredictable (i.e., more Random). In addition, we predict that these effects will remain significant when we control for various socio-demographic variables that have previously been found to be associated with political ideology, such as gender, age, income, level of education, ethnicity, and the strength of religious beliefs.

Third, mapping uncertainty beliefs along three conceptually independent dimensions also allows us to examine the relative importance of each dimension as a predictor of political ideology. This leads to a more nuanced understanding of what distinguishes liberal ideology from conservative ideology. Instead of placing liberals and conservatives on opposite ends of a luck versus effort continuum, we will be able to examine precisely to what extent each of the three dimensions is uniquely associated with the ideological divide.

Fourth, to further explore the extent to which the Rewarding, Rigged, and Random dimensions constitute a promising framework for crafting effective political and policy messages, we compare each dimension's ability to predict political ideology with several psychological constructs that have previously been found to correlate with political ideology. In

particular, two of these constructs can serve as relevant benchmarks. First, we examine social dominance orientation (SDO; Pratto et al., 1994) and right-wing authoritarianism (RWA; Altemeyer, 1988). Together, a preference for social hierarchy (as captured by SDO) and a commitment to authority and tradition (as captured by RWA) seem to lie at the core of what it means to hold conservative beliefs (Duckitt & Sibley, 2010; Jost et al., 2003; Wilson & Sibley, 2013). We thus expect to find that both these constructs are positively associated with self-reported conservative ideology.

The second comparison we wish to highlight is with the five moral foundations of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and purity/degradation, as proposed in Moral Foundations Theory (Graham et al., 2011, 2013, 2018). Prior research has found that the weight that people put on each of these foundations when making moral judgments is associated with their political ideology. Compared to conservatives, liberals generally base their morality judgments more on the individualizing values—whether or not they believe an action violates the principles of care/harm and fairness/cheating. Compared to liberals, conservatives generally base their morality judgments more on the binding values—whether or not they believe an action violates principles of loyalty/betrayal, authority/subversion, and purity/degradation (Graham et al., 2009; Haidt & Graham, 2007).

In Study 1 we examine the role of the three dimensions of beliefs about changes in financial well-being in predicting political ideology, controlling for the effects of SDO, RWA, the five moral foundations, and several other scales that have been previously related to political preferences.

Method

Participants

We recruited participants through Lucid’s Fulcrum Academia service (N = 1102; 52% female, $M_{\text{age}} = 44.01$, $SD_{\text{age}} = 16.63$). We aimed to recruit 1000 participants and ended up with partial or complete data for 1168 participants. The sample was demographically targeted using quotas to be representative of the U.S. population in terms of age, gender, region, household income, education, and ethnicity. We removed data of 66 participants before analyses because they did not complete one of the key variables. The collected data was supplemented with socio-demographic information that participants had provided to the panel service at an earlier time (level of education, ethnicity, gender, household income, political party preference, and U.S. region of residence).

Procedure & Materials

Following multiple rounds of piloting and adjustments, we developed a nine-item Financial Epistemic-Aleatory Rating Scale (F-EARS) measuring lay theories about changes in financial well-being that we adapted from the Epistemic-Aleatory Rating Scale (EARS; Fox, Tannenbaum et al., 2020). In the first part of the survey, participants rated their level of agreement (1 = “not at all”; 7 = “very much”) with nine statements that assessed the perceived nature of uncertainty in a “person’s change in financial well-being from one year to the next.” The nine items were presented in random order on a single page. Three items were designed to assess the extent to which participants perceived changes in financial well-being as knowable based on inputs such as effort and skill, and were averaged into a single *Rewarding* score. Three items were designed to assess the extent to which participants perceived changes in financial well-being as knowable based on systemic factors such as discrimination and favoritism, and were averaged into a single *Rigged* score. Three items were designed to assess the extent to which participants perceived changes in financial well-being as being due to chance events and were averaged into a single

Random score. See Table 2 for all items of the F-EARS and Table 3 for scale descriptive statistics and measures of internal consistency.

In the second section of the survey, participants rated their political attitudes and beliefs on a seven-point scale (1 = “extremely liberal”; 7 = “extremely conservative”).

The third part of the survey consisted of a series of scales measuring constructs potentially associated with political ideology and beliefs about financial well-being. In random order, participants were presented with the following measures: Social Dominance Orientation (SDO; Ho et al., 2015), Right-Wing Authoritarianism (RWA; Bizumic & Duckitt, 2018), Moral Foundations Questionnaire (MFQ; Graham et al., 2011), Belief in a Just World (BJW; Dalbert, 1999), General System Justification (GSJ; Kay & Jost, 2003), Protestant Work Ethic (PWE; Ho et al., 2012), trait optimism (Scheier et al., 1994), meritocratic beliefs (Day & Fiske, 2017), perceived societal social mobility (Day & Fiske, 2017), perceived individual social mobility (Day & Fiske, 2017), two questions assessing attributions of wealth and poverty (adapted from Gallup, 1998; PEW, 2018), one question from the World Values Survey about why there are people living in need (WVS, n.d.), and two questions about the perceived fairness of the American economic system (adapted from WVS, n.d.; PEW, 2018).

In a final section of the survey, participants indicated their subjective socio-economic status using the MacArthur Scale of Subjective Social Status (MSSSS; Adler et al., 2000), some additional socio-demographic information, which political party they would vote for if a congressional election were held today, and who they voted for in the 2016 Presidential election. See the Supplemental Material for full details on the measures used.

Table 2*Items of the Epistemic-Aleatory Rating Scale for Changes in Financial Well-being (F-EARS)*

Dimension	F-EARS item
	A person's change in financial well-being from one year to the next... (1 = 'not at all'; 7 = 'very much')
Rewarding	...is the result of how hard the person works. ...tends to improve with the person's resourcefulness and problem solving ability. ...is predictable if you know the person's skills and talents.
Rigged	...depends on how much discrimination or favoritism the person faces. ...is predictable because some groups will always be favored over others. ...depends on the person's initial status and wealth (i.e., rich tend to get richer and poor tend to get poorer).
Random	...is something that has an element of randomness. ...is determined by inherently unpredictable life events (e.g., getting robbed or winning the lottery). ...is determined by chance factors.

Table 3*F-EARS Descriptive Statistics and Measures of Internal Consistency for Study 1-4*

Study 1					
Subscale	<i>M</i>	<i>SD</i>	α	ω_t	ω_h
Rewarding	4.92	1.20	0.65	0.66	0.66
Rigged	4.25	1.43	0.73	0.73	0.74
Random	4.18	1.33	0.70	0.70	0.70
Study 2					
Subscale	<i>M</i>	<i>SD</i>	α	ω_t	ω_h
Rewarding	4.91	1.07	0.68	0.69	0.68
Rigged	4.32	1.29	0.75	0.75	0.75
Random	4.06	1.27	0.78	0.78	0.78
Study 3					
Subscale	<i>M</i>	<i>SD</i>	α	ω_t	ω_h
Rewarding	4.66	1.16	0.73	0.73	0.73
Rigged	4.34	1.34	0.75	0.75	0.75
Random	4.11	1.26	0.78	0.78	0.79
Study 4					
Subscale	<i>M</i>	<i>SD</i>	α	ω_t	ω_h
Rewarding	4.72	1.12	0.71	0.71	0.71
Rigged	4.37	1.33	0.76	0.76	0.76
Random	4.16	1.24	0.75	0.75	0.75

Note. α = Cronbach's alpha; ω_t = McDonald's omega total; ω_h = McDonald's omega hierarchical.

Results

In this section we examine psychometric properties and validity of the F-EARS (cf. Flake et al., 2017): in particular, we test its factor structure, demonstrate measurement invariance, and test its predictive validity against related constructs.

Examining the Factor Structure of F-EARS

To examine structural validity, we used confirmatory factor analysis to evaluate the fit of the proposed model and compare it to the three alternative models derived from past literature. Table 4 shows fit indices for the single-dimension (Accountability) model, the epistemic-aleatory (EA) model that distinguishes between a single knowable dimension and a random dimension, the discretionary-exogenous (DE) model that distinguishes between a dimension within the individual's control and a dimension beyond the individual's control, and our Rewarding-Rigged-Random (RRR) model. Using the cutoff values suggested by Hu and Bentler (1999), all indices indicate a good between the RRR model and the observed data: comparative fit index (CFI) > .95, Tucker-Lewis index (TLI) > .95, root mean square error of approximation (RMSEA) < .06, and standardized root mean square residual (SRMR) < .08. A comparison of χ^2 values confirms our preregistered prediction that the proposed RRR model fits significantly better than the Accountability model ($\Delta\chi^2(3) = 462.74, p < .001$), the EA model ($\Delta\chi^2(2) = 330.34, p < .001$), and the DE model ($\Delta\chi^2(2) = 144.92, p < .001$). In addition, the RRR model has the lowest Bayesian Information Criterion (where lower indicates better fit) and is the only model that passes Hu and Bentler's (1999) suggested combination rule of RMSEA < .06 and SRMR < .09.¹ Figure 1 displays a graphical representation of the RRR model, including the standardized factor loadings and covariances between latent variables.

¹ We present a similar analysis with data from Studies 2-4 in the Supplemental Material.

Table 4

Study 1 Fit Indices for the Accountability Model, Epistemic-Aleatory (EA) Model, Discretionary-Exogenous Model (DE) Model, and Rewarding-Rigged-Random (RRR) Model

Model	χ^2	<i>df</i>	<i>p</i>	BIC	CFI	TLI	RMSEA	SRMR
Accountability model	550.39	27.00	< .001	36,729.23	0.77	0.69	0.13	0.08
EA model	417.99	26.00	< .001	36,603.84	0.83	0.76	0.12	0.08
DE model	232.57	26.00	< .001	36,418.42	0.91	0.87	0.08	0.05
RRR model	87.65	24.00	< .001	36,287.51	0.97	0.96	0.05	0.04

Note. BIC = Bayesian Information Criterion; CFI = Comparative Fit Index; TLI = Tucker-Lewis fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Testing Measurement Invariance

We next tested whether the factor structure of the F-EARS is equivalent across different groups within the sample, a criterion of structural validity that is often neglected by researchers (Flake et al., 2017). In particular, we test for measurement invariance between male and female participants, between participants below or above median age (= 43), and between self-rated political conservatives and liberals. Following Hussey and Hughes (2020; see also Putnick & Bornstein, 2016), we test for: (1) configural invariance, which assesses adequacy of the fit of the unconstrained model across groups; (2) metric invariance, which assesses equivalence of factor loadings across groups; and (3) scalar invariance, which tests for equivalence of item intercepts across groups.

Table 5 shows the fit indices used to test for configural invariance and Table 6 shows the differences in fit indices used to test for metric and scalar invariance. All tests of measurement

invariance fall pass conventional testing criteria, indicating that the F-EARS measures the same constructs (Rewarding, Rigged, and Random) in male and female participants, younger and older participants, and liberal and conservative participants.

Table 5

Study 1 Fit Indices for Tests of Configural Invariance on Gender, Age, and Political Ideology

Measurement invariance test	χ^2	<i>df</i>	<i>p</i>	CFI	TLI	RMSEA	SRMR	Result
Configural inv.: Gender	126.72	48	< .001	0.966	0.949	0.055	0.041	Passed
Configural inv.: Age	151.81	48	< .001	0.955	0.932	0.063	0.041	Passed
Configural inv.: Political id.	113.53	48	< .001	0.957	0.936	0.062	0.046	Passed

Note. CFI = comparative fit index; TLI = Tucker-Lewis fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. Test is passed when $SRMR \leq 0.09$ and at least one of the following conditions is met: $CFI \geq 0.95$, $TLI \geq 0.95$, $RMSEA \leq 0.06$. Criteria based on Hussey and Hughes (2020), Hu and Bentler (1999), Chen (2007), and Putnick and Bornstein (2016).

Table 6

Study 1 Differences in Fit Indices for Tests of Metric and Scalar Invariance on Gender, Age, and Political Ideology

Measurement invariance test	<i>df</i>	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$	Result
Metric inv.: Gender	6	-0.004	0.001	-0.001	0.005	Passed
Metric inv.: Age	6	0.000	0.008	-0.004	0.003	Passed
Metric inv.: Political id.	6	0.002	0.010	-0.005	0.001	Passed
Scalar inv.: Gender	6	0.000	0.005	-0.003	0.000	Passed
Scalar inv.: Age	6	-0.004	0.001	0.000	0.002	Passed
Scalar inv.: Political id.	6	-0.001	0.004	-0.002	0.003	Passed

Note. CFI = comparative fit index; TLI = Tucker-Lewis fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. Tests are passed when $\Delta\text{CFI} \geq -0.015$ and $\Delta\text{RMSEA} \leq 0.01$. Criteria based on Hussey and Hughes (2020), Hu and Bentler (1999), Chen (2007), and Putnick and Bornstein (2016).

Rewarding, Rigged, and Random as Predictors of Political Ideology

Figure 2 displays the association between political ideology and scores on the three subscales of the F-EARS. Confirming our expectations, participants who rated themselves as more politically conservative tended to score higher on the Rewarding dimension ($r = 0.13, p < .001$), lower on the Rigged dimension ($r = -0.20, p < .001$), and lower on the Random dimension ($r = -0.09, p = .005$).

To examine predictive validity, we specified a series of structural equation path models testing each dimension (Rewarding, Rigged, and Random) as a latent variable predictor of political ideology, while controlling for the set of socio-demographic variables.² We do this first for individual subscales, as displayed in Figure 3, then simultaneously for all subscales, as displayed in Figure 4.

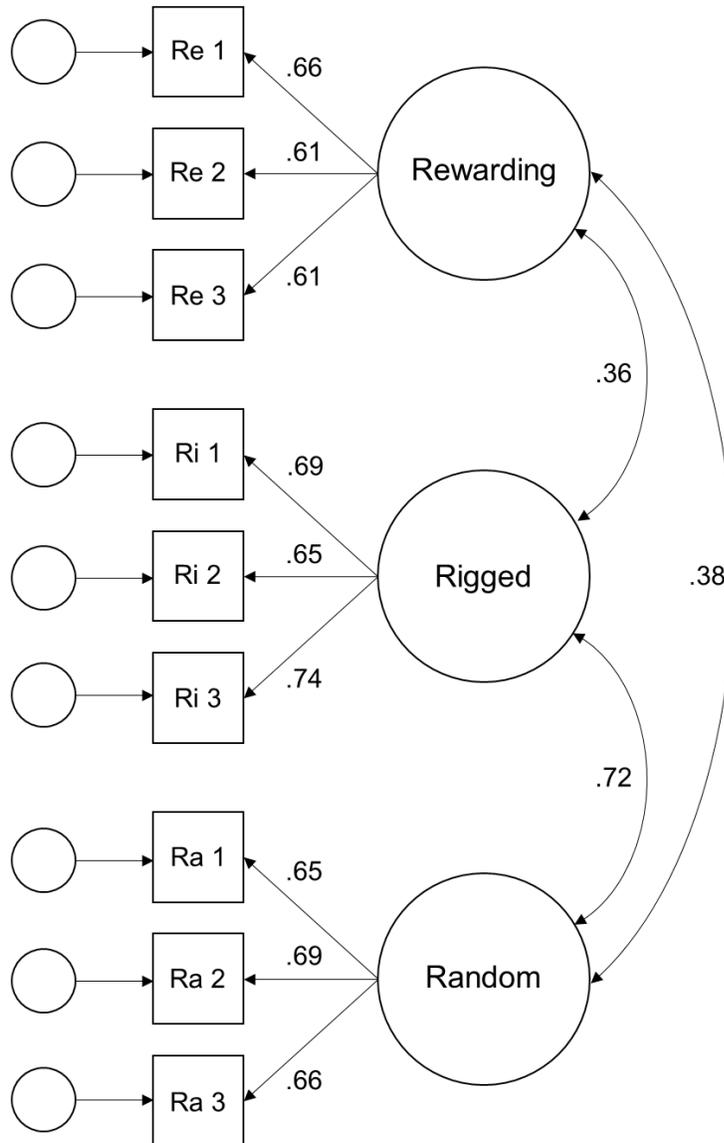
The independent tests of each subscale (Figure 3) shows that when controlling for socio-demographic variables, Rewarding has a significant positive association with political ideology (conservatism), Rigged has a significant negative association with political ideology, and Random has a significant negative association with political ideology. The simultaneous test of all subscales (Figure 4) shows that the Rigged and the Rewarding dimensions are both

² We estimated missing data using full information maximum likelihood. Confirmatory factor analysis and structural equation modeling were performed using R (Version 3.6.0; R Core Team, 2018) and the R-package lavaan (Version 0.6.3; Rosseel, 2012).

significantly associated with political ideology, even when controlling for the other dimensions of beliefs about financial well-being and socio-demographic variables. The effect of the Random subscale on political ideology in this case is no longer significant. A fuller account of these models is described in the Supplemental Material.

Figure 1

Results of a Confirmatory Factor Analysis for the RRR Model with Rewarding, Rigged, and Random as Latent Variables (Study 1).



Note. Numbers on the left indicate standardized factor loadings. Numbers on the right (curved arrows) indicate standardized latent variable covariances.

Figure 2

Scores on F-EARS Subscales as a Function of Self-reported Political Ideology (Study 1).

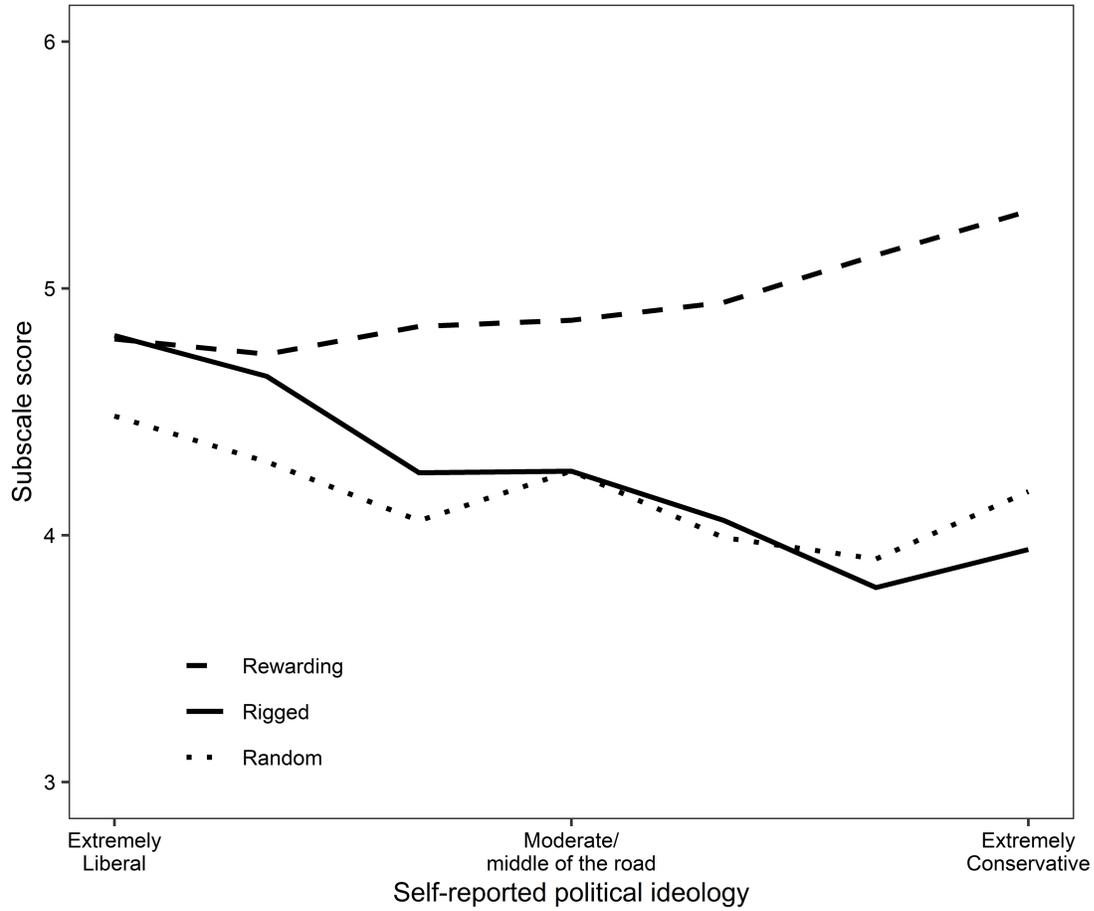
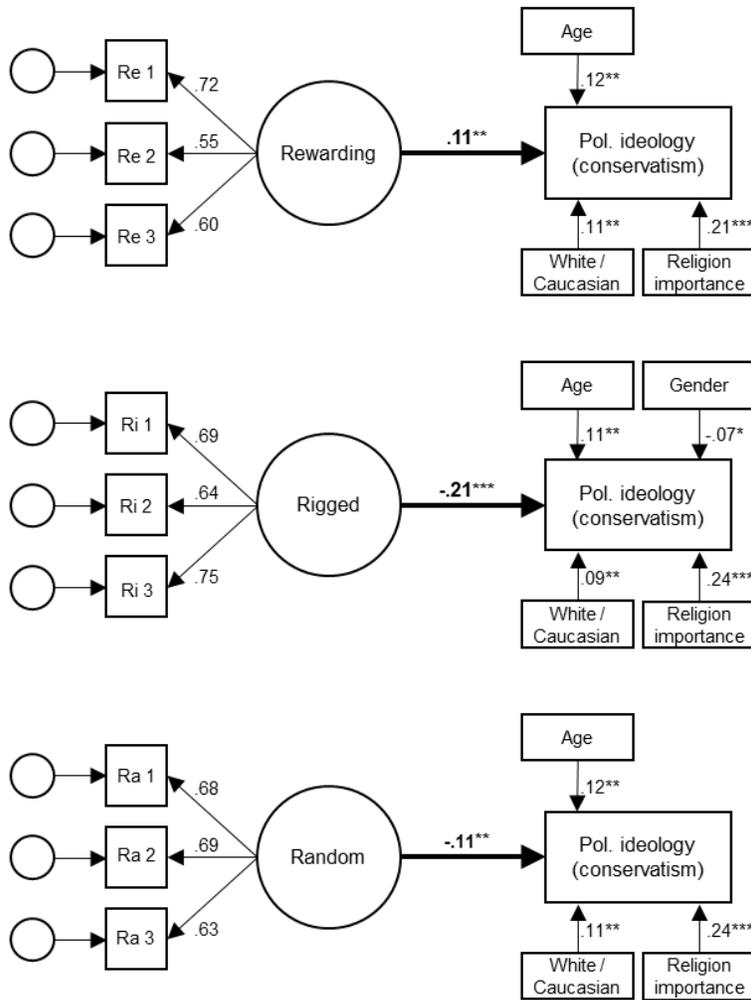


Figure 3

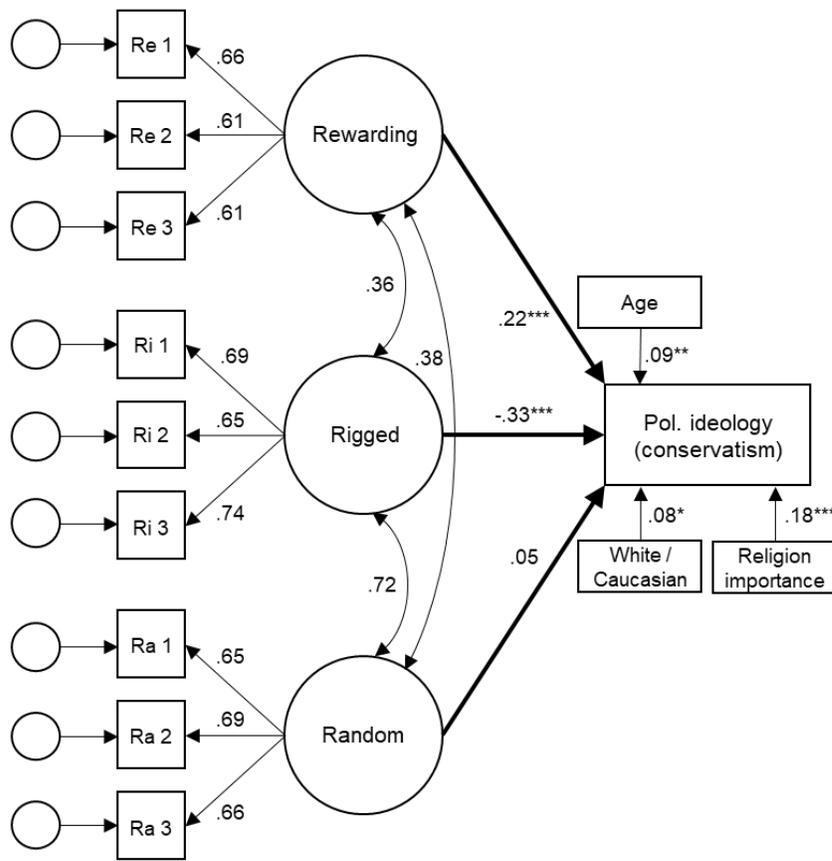
Path Models Showing the Independent Effects of the Rewarding, Rigged, and Random Subscales of F-EARS on Political Ideology, Controlling for the Effect of Socio-demographic Variables (Study 1).



Note. Numbers on the left indicate standardized factor loadings. Numbers on the right indicate standardized regression coefficients for all significant predictors (* $p < .05$, ** $p < .01$, *** $p < .001$). Predictors that were included in the models but were not significant: only child, subjective SES, household income, Hispanic/Latino, religion, college degree, married, employed, children, first born, U.S. born.

Figure 4

Path Model Showing the Simultaneous Effect of the Rigged, Rewarding, Random Subscales of F-EARS on Political Ideology, Controlling for the Effect of Socio-demographic Variables (Study 1).



Note. Numbers on the left indicate standardized factor loadings. Numbers in the middle (curved arrows) indicate standardized latent variable covariances. Numbers on the right indicate standardized regression coefficients for all significant predictors (* $p < .05$, ** $p < .01$, *** $p < .001$). Predictors that were included in the models but were not significant: gender, only child, subjective SES, household income, Hispanic/Latino, religion, college degree, married, employed, children, first born, U.S. born.

Predicting Political Ideology when Controlling for Related Constructs

We next test the predictive validity of F-EARS subscales against other individual difference measures that have been related to political ideology in prior literature. Simple correlational analyses largely replicate prior results. In particular, participants with a higher SDO score, indicating a preference for hierarchical social structure, rated themselves as more politically conservative ($r = 0.26, p < .001$). Participants with a higher RWA score, indicating a commitment to authority and tradition, also rated themselves as more politically conservative ($r = 0.39, p < .001$). As for Moral Foundations, participants who rated themselves as more conservative put less weight on the fairness dimension ($r = -0.08, p = .014$), and more weight on the dimensions of ingroup loyalty ($r = 0.12, p < .001$), obedience to authority ($r = 0.10, p = .001$), and purity ($r = 0.17, p < .001$). Interestingly, political ideology was not significantly correlated with the rated importance of the harm dimension ($r = -0.03, p = .281$).

We performed three sets of linear regression analyses. The first set examined whether the Rewarding, Rigged, and Random subscales are each still significant predictors of political ideology when controlling for SDO and RWA (see Table 7). All three subscales of the F-EARS remain significant predictors of political ideology when controlling for these scales. Likewise, a second set of three regression analyses examined whether the Rewarding, Rigged, and Random subscales are each still significant predictors of political ideology when controlling for the five moral foundations of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and purity/degradation (see Table 8). Again, all three subscales of the F-EARS remain significant when controlling for the five moral foundation subscales.

In a final regression analysis, we included all 19 individual difference measures and 15 socio-demographic variables simultaneously into a single linear regression and examined whether the Rewarding, Rigged, and Random subscales of the F-EARS remain significant predictors of political ideology (see Table 9). The positive effect of the Rewarding dimension and the negative effect of the Rigged dimension on political ideology (conservatism) remain significant in this full model. Other significant predictors are age, ethnicity (white/Caucasian), SDO, RWA, meritocratic beliefs,³ and causal attribution of poverty. The effect of the Random dimension on political ideology is no longer significant. Figure 5 shows the absolute standardized regression coefficients of the included variables.

As can be seen in Table 9 and Figure 5, many psychological constructs that have been linked to political ideology in past research are no longer significant predictors when included in our full model. To follow up on this finding, we conducted a series of mediation analyses, which indicate that Rewarding and Rigged (but not Random) partially mediate the effect on political ideology of: Belief in a Just World, General System Justification, Protestant Work Ethic, as well as the effects of all five moral foundations. For more detail on these analyses, see the Supplemental Material.

³ Our 3-item Rewarding subscale differs from the 9-item meritocratic beliefs scale in that ours includes an item about predictable rewards to hard work (Rewarding item 1), as well as items on resourcefulness and problem-solving ability (Rewarding item 2) and talents and abilities (Rewarding item 3). In contrast, the meritocratic beliefs scale only includes items that involve rewards to hard work. Not surprisingly, we find a higher correlation between the meritocratic beliefs scale and the hard work item of the Rewarding subscale ($r = 0.39, p < .001$) compared to the item about resourcefulness and problem-solving ability ($r = 0.35, p < .001$), and the item about skills and talents ($r = 0.25, p < .001$).

Table 7

Linear Regression Results for the Effects of F-EARS Subscales on Political Ideology (Higher is more Conservative) Controlling for the Effects of SDO and RWA in Study 1.

Effect	Model 1		Model 2		Model 3	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.12 [0.04, 0.20]	0.08 **				
Rigged			-0.19[-0.25, -0.12]	-0.16 ***		
Random					-0.12[-0.19, -0.05]	-0.09 **
SDO	0.34 [0.24, 0.43]	0.20 ***	0.48 [0.23, 0.41]	0.19 ***	0.34 [0.25, 0.43]	0.20 ***
RWA	0.53 [0.44, 0.62]	0.34 ***	0.52 [0.44, 0.61]	0.34 ***	0.55 [0.46, 0.63]	0.35 ***
Intercept	0.14 [-0.41, 0.70]		1.63 [1.09, 2.16]	***	1.17 [0.65, 1.69]	***
Observations	1035		1035		1035	
R^2	.20		.22		.20	
Adjusted R^2	.20		.22		.20	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 8

Linear Regression Results for the Effects of F-EARS Subscales on Political Ideology (Higher is More Conservative) Controlling for the Effects of the Five MFQ Subscales in Study 1.

Effect	Model 1		Model 2		Model 3	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.14 [0.05, 0.23]	0.10 **				
Rigged			-0.24[-0.31, -0.17]	-0.20***		
Random					-0.16[-0.24, -0.09]	-0.13 ***
MFQ: care/harm	-0.16[-0.31, -0.02]	-0.11 *	-0.13[-0.28, 0.01]	-0.08	-0.16[-0.31, -0.01]	-0.10 *
MFQ: fairness/cheat.	-0.33[-0.48, -0.19]	-0.22***	-0.27[-0.41, -0.13]	-0.17***	-0.32[-0.46, -0.18]	-0.21 ***
MFQ: loyalty/betray.	0.13 [-0.01, 0.27]	0.09	0.15 [0.02, 0.29]	0.10 *	0.14 [0.01, 0.28]	0.09 *
MFQ: authority/subv.	0.08 [-0.07, 0.23]	0.05	0.09 [-0.06, 0.24]	0.05	0.13 [-0.02, 0.28]	0.08
MFQ: purity/degrad.	0.33 [0.21, 0.46]	0.23 ***	0.33 [0.21, 0.46]	0.23 ***	0.35 [0.22, 0.47]	0.24 ***
Intercept	3.34 [2.80, 3.88]	***	4.53 [4.04, 5.02]	***	4.32 [3.81, 4.82]	***
Observations	1040		1040		1040	
R^2	.09		.12		.10	
Adjusted R^2	.08		.11		.09	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 9

Linear Regression Results for the Effects of F-EARS Subscales on Political Ideology (Higher is more Conservative) in Study 1, Controlling for the Effects of Socio-demographic Variables and Individual Differences Measures in Model 2.

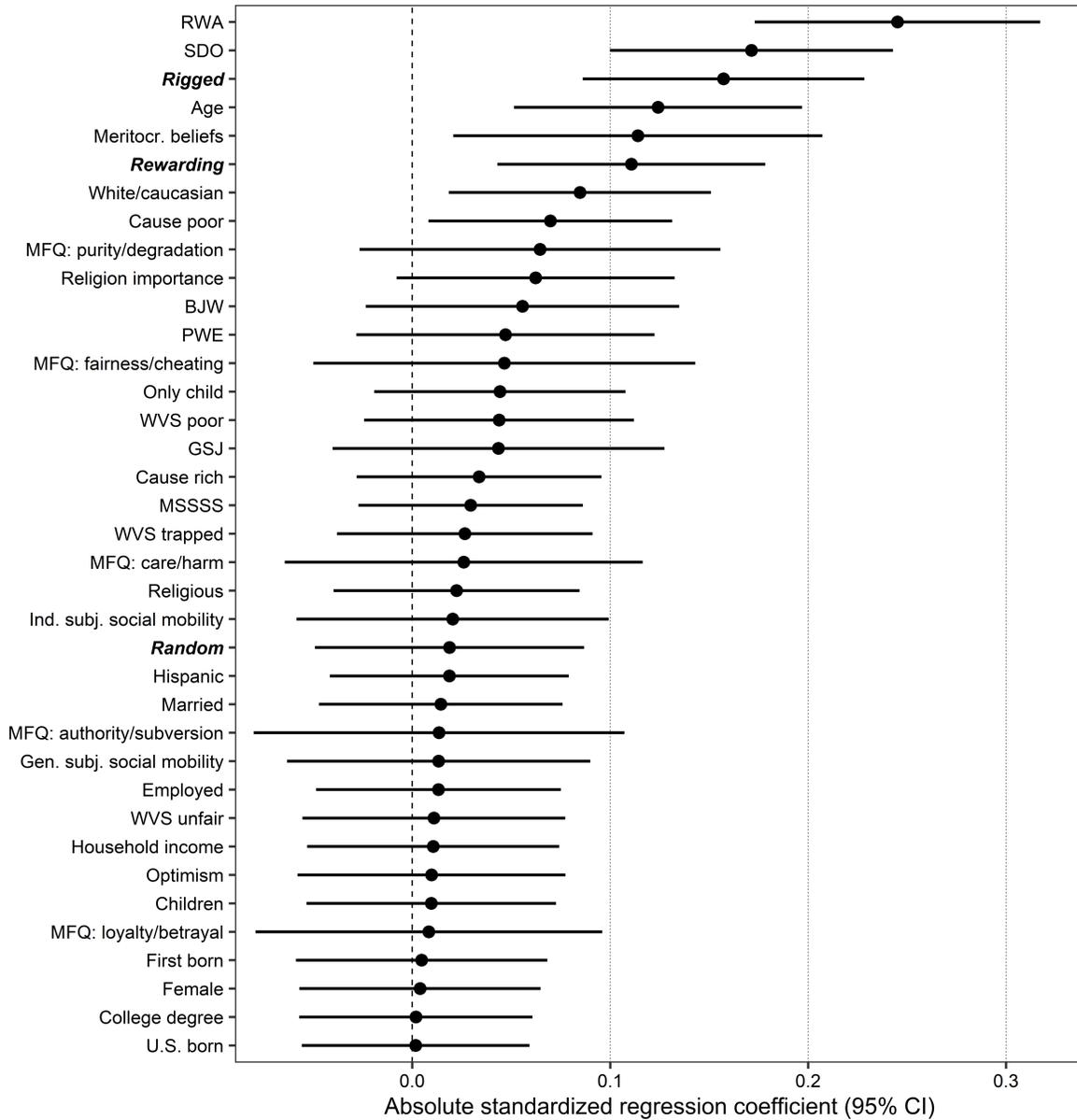
Effect	Model 1		Model 2	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.27 [0.19, 0.36]	0.19***	0.16 [0.06, 0.26]	0.11**
Rigged	-0.29[-0.37, -0.21]	-0.24***	-0.19[-0.27, -0.10]	-0.16***
Random	-0.01[-0.10, 0.07]	-0.01	-0.02[-0.11, 0.06]	-0.02
Age			0.01 [0.01, 0.02]	0.12**
Female			-0.01 [-0.22, 0.20]	-0.00
Household income			0.00 [-0.02, 0.01]	-0.01
White/Caucasian			0.32 [0.07, 0.58]	0.08*
Hispanic			0.10 [-0.22, 0.42]	0.02
Religious			-0.08 [-0.29, 0.14]	-0.02
College degree			-0.01 [-0.21, 0.20]	-0.00
Married			0.05 [-0.16, 0.26]	0.01
Employed			-0.05 [-0.26, 0.17]	-0.01
Children			0.03 [-0.19, 0.25]	0.01
First born			0.02 [-0.20, 0.24]	0.00
Only child			0.22 [-0.10, 0.54]	0.04
Religion importance			0.05 [-0.01, 0.10]	0.06
U.S. born			-0.01 [-0.44, 0.41]	-0.00
MSSSS			-0.02 [-0.06, 0.02]	-0.03
SDO			0.29 [0.17, 0.41]	0.17***
RWA			0.38 [0.27, 0.49]	0.25***
GSJ			-0.07 [-0.21, 0.07]	-0.04
BJW			-0.08 [-0.20, 0.04]	-0.06
PWE			-0.08 [-0.20, 0.05]	-0.05
Optimism			-0.01 [-0.11, 0.08]	-0.01
Meritocratic beliefs			0.18 [0.03, 0.32]	0.11*

Societal social mobility			0.02 [-0.11, 0.15]	0.01
Individual social mobility			0.03 [-0.09, 0.15]	0.02
MFQ: care/harm			-0.04[-0.19, 0.10]	-0.03
MFQ: fairness/cheating			-0.07[-0.23, 0.08]	-0.05
MFQ: loyalty/betrayal			0.01 [-0.12, 0.15]	0.01
MFQ: authority/subversion			-0.02[-0.17, 0.13]	-0.01
MFQ: purity/degradation			0.09 [-0.04, 0.23]	0.06
Cause poor			-0.19[-0.36, -0.02]	-0.07*
Cause rich			0.09 [-0.07, 0.25]	0.03
WVS poor			-0.15[-0.39, 0.08]	-0.04
WVS trapped			0.09 [-0.13, 0.32]	0.03
WVS unfair			-0.04[-0.27, 0.20]	-0.01
Intercept	3.92 [3.45, 4.40]	***	1.30 [-0.14, 2.75]	
Observations	1096		958	
R^2	.07		.29	
Adjusted R^2	.07		.26	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 5

Effects of Individual Difference Measures and Sociodemographic Variables on Political Ideology from Multiple Regression Analysis (Study 1).



Discussion

The results from Study 1 confirm that people's beliefs about changes in financial well-being can best be described along three conceptually independent dimensions: Rewarding, Rigged, and Random. We designed a scale to measure lay theories in this context, and found that responses to this scale are, in fact, better captured by the three-dimensional Rewarding, Rigged, and Random model than alternative models that helped inspire our thinking. To understand how people think about changes in financial well-being, we need more than a single dimension of perceived individual control, more than two independent dimensions of beliefs about the role of discretionary and exogenous factors determining financial outcomes, and more than a distinction between knowable and random uncertainty. By combining insights from different lines of past research, we come to a more nuanced mapping of lay beliefs, one that recognizes that some exogenous factors determining financial well-being are perceived as knowable whereas other exogenous factors are perceived as random.

In a sample of participants that was demographically representative of the United States, we find that the Rewarding, Rigged, and Random dimensions are all associated with political ideology, even when controlling for the effect of socio-demographic variables and other psychological constructs such as Social Dominance Orientation, Right-Wing Authoritarianism, and moral foundations.

Past research has focused on beliefs about the degree of individual control as a predictor of political ideology. Using the model proposed here, with three conceptually and structurally independent dimensions, we can go a step further and examine the relative importance of the knowable and random elements of those beliefs. We find that the two knowable dimensions (Rewarding and Rigged) are more important predictors of political ideology than the Random

dimension. This suggests that we should not simply equate beliefs about a lack of individual control with beliefs about the role of luck in determining financial outcomes. People intuitively distinguish between the knowable and the random, and this distinction matters when trying to explain political preferences.

Contrary to our preregistered prediction, the effect of the Random dimension on political ideology was no longer significant after controlling for the effects of the Rewarding and the Rigged dimensions. People's political preferences seem to be connected more strongly to their beliefs about the Rewarding and Rigged nature of changes in financial well-being. Beliefs about randomness, however, are not as naturally tied to political beliefs, possibly because people are unlikely to fully appreciate the impact of luck on life outcomes (Frank, 2016). One potential strategy for revealing the importance of the Random dimension is to explicitly link aspects of a policy to the randomness of changes in financial well-being—a notion that we will test in the studies that follow.

In this study and the studies that follow, we focus on capturing lay theories concerning *future changes* in financial well-being, rather than lay theories concerning what determines *current states* of financial well-being (i.e., causes of current wealth inequality). We expected that beliefs about changes in financial well-being would be more relevant to people's policy preferences and we designed the statements of the F-EARS to reflect this focus: participants are asked about “a person's change in financial well-being from one year to the next.” Of course, it is possible that people's lay theories about the determinants of current states of financial well-being are different from their lay theories about future changes in financial well-being. Likewise, it is possible that the strength of associations between different dimensions is more or less strong when framed in terms of states rather than changes. To explore this possibility, we conducted an

additional study, comparing the association between political ideology and the standard F-EARS versus a modified version of the scale. The standard version of the F-EARS was designed to capture lay theories about future changes in financial well-being as usual, which we refer to in this section as “F-EARS Changes.” The modified version of the F-EARS was designed to capture lay theories about current states of financial well-being by asking participants to evaluate various causes of “whether a person is rich or poor,” which we refer to in this section as “F-EARS States.” See the Supplemental Material for details on the study and its results.

We first examined the factor structure and tested for measurement invariance, finding no evidence that the factor structure of F-EARS States is different from F-EARS Changes. We then examined the associations between political ideology and the Rewarding, Rigged, and Random subscales, respectively. For both versions, participants who rated themselves as more politically conservative tended to score higher on the Rewarding dimension ($r_{\text{Changes}} = 0.35, p < .001$; $r_{\text{States}} = 0.31, p < .001$), lower on the Rigged dimension ($r_{\text{Changes}} = -0.34, p < .001$; $r_{\text{States}} = -0.43, p < .001$), and lower on the Random dimension ($r_{\text{Changes}} = -0.08, p = .019$; $r_{\text{States}} = -0.20, p < .001$). See Table 10 for the results of a series of linear regressions, showing that the positive association between the Rewarding subscale and political ideology is significantly weaker when using F-EARS States than when using F-EARS Changes; the negative association between the Random subscale and political ideology is significantly stronger when using F-EARS States than when using F-EARS Changes; the association between the Rigged subscale and political ideology is not significantly different when using F-EARS States than when using F-EARS Changes. Taken together, these results indicate that the factor structure of lay theories about financial well-being and its directional association with political ideology does not depend on whether people consider changes versus states of financial well-being. At the same time, the strength of the

association between each subscale and political ideology may vary modestly under these two versions.

Now that we have established how people differ in their beliefs concerning changes in financial well-being, we can predict how they will respond to different messages in support of social welfare policy. Study 2 examines how the Rewarding, Rigged, and Random dimensions are uniquely associated with rated importance of different goals that a government may pursue when allocating resources.

Table 10

Linear Regression Results for the Effects of F-EARS Subscales on Political Ideology (Higher is More Conservative) and the Interaction with Scale Version (F-EARS States versus F-EARS Changes).

Effect	Model 1		Model 2		Model 3	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.57 [0.47, 0.68]	0.38 ***				
Rigged			-0.48[-0.56, -0.39]	-0.35 ***		
Random					-0.11[-0.20, -0.02]	-0.08 *
States vs. Changes	0.80 [0.14, 1.47]	0.23 *	0.48 [-0.07, 1.03]	0.14	0.57 [0.06, 1.09]	0.16 *
Rew \times States	-0.14[-0.28, -0.00]	-0.20 *				
Rig \times States			-0.08[-0.20, 0.04]	-0.12		
Ran \times States					-0.15[-0.28, -0.03]	-0.19 *
Intercept	0.71 [0.19, 1.23]	**	5.63 [5.24, 6.03]	***	3.96 [3.59, 4.33]	***
Observations	1759		1759		1759	
R^2	.11		.15		.02	
Adjusted R^2	.11		.15		.02	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Study 2

Given limited resources, governments must decide how to prioritize different kinds of social welfare policies. Here we distinguish three types of goals for a government to pursue in their allocation of funds.

To the extent that a person believes that changes in financial well-being are Rewarding—that is, knowable and within the control of the individual—we hypothesize that this person would prefer the government to use resources in a way that enables people to pull themselves out of financial hardship. The government would thus try to make sure that hard work and initiative are incentivized, while also trying to avoid the possibility of free-riding. We refer to this as an *Incentivizing* goal.

To the extent that a person believes that changes in financial well-being are Rigged—that is, knowable but beyond the control of the individual—we hypothesize that this person would prefer the government to correct systemic inequity by allocating resources to groups in society that routinely experience financial hardship. The government would thus be involved in the redistribution of resources to disadvantaged groups. We refer to this as a *Redistribution* goal.

Finally, to the extent that a person believes that changes in financial well-being are Random—that is, not knowable in advance and beyond control of the individual, we hypothesize that this person would prefer the government to pool resources to support anyone who happens to experience financial hardship. The government would thus implement social welfare policy as a way of providing insurance against unforeseeable financial risks. We refer to this as a *Risk-pooling* goal.

To test these hypotheses we will compare the direction and strength of the associations between beliefs about changes in financial well-being and the rated importance of the different

government goals. We predict that: (a) scores on the Rewarding subscale will be more positively associated with rated importance of the Incentivizing goal versus the other two goals, (b) scores on the Rigged subscale will be more positively associated with rated importance of the Redistribution goal versus the other two goals, and (c) scores on the Random subscale will be more positively associated with rated importance of the Risk-pooling goal versus the other two goals.

Methods

Participants

We recruited participants through Amazon's Mechanical Turk ($N = 1207$; 55% female, $M_{\text{age}} = 37.98$, $SD_{\text{age}} = 14.00$). We aimed to recruit 1200 participants and ended up with partial or complete data for 1227 participants. We removed data of 20 participants before analyses because they did not give responses for all key variables.

Procedure & Materials

In the first section of the survey, participants read about three distinct goals in a random order that the government might pursue: (1) "The government should use resources to incentivize and enable people to pull themselves out of financial hardship and realize their full potential"; (2) "The government should allocate resources to individuals belonging to disadvantaged groups that routinely experience financial hardship"; (3) "The government should pool resources to support people when they happen to experience unforeseeable financial hardship". These three goals we label in our analysis Incentivizing, Redistribution, and Risk-pooling, respectively. Participants rated each goal on how important it is for the U.S. government to pursue (1 = "not important at all"; 7 = "extremely important").

In the second section, participants completed the F-EARS as in Study 1. Table 3 displays scale descriptive statistics and measures of internal consistency. We randomized the order of the first section (the rating and ranking of government goals) and the second section (the F-EARS).

In a third and final section, participants answered a series of demographic and political identity questions. See the Supplemental Material for full details on our procedures and measures.

Results

We specified a linear mixed model—which took each participant by government goal rating as the unit of analysis (for a total of 3681 observations)—to treat participants as random effects, thus accounting for the individual-level variation in responses to the government goals. As fixed effects the model included scores on the three subscales of the F-EARS (Rewarding, Rigged, and Random), the government goal (Incentivizing, Redistribution, and Risk-pooling), and the nine interactions between the three F-EARS subscales and three government goals. Our key prediction is that six of these nine interactions will be significant such that rating on a given F-EARS subscale (e.g., Rewarding) is more positively associated with rated importance of the most compatible government goal (i.e., Incentivizing) than the two less compatible goals (i.e., Redistribution and Risk-pooling). We make no prediction concerning the relative associations between the government goals hypothesized to be less compatible with a given F-EARS subscale. To test our key hypotheses, we examined the fixed interaction effects between government goal and Rewarding, Rigged, and Random.⁴

⁴ To interpret the nature of the interaction effects, we run the same mixed model twice with different reference levels for the factor government goal: once with Risk-pooling goal as reference level and once with Incentivizing goal as reference level. The linear mixed models in Study 2-4 were analyzed using R (Version 3.6.0; R Core Team, 2018) and the R-packages lme4 (Version 1.1.21; Bates et al., 2015), and lmerTest (Version 3.1.0; Kuznetsova et al., 2017).

The results of this analysis show that five of the six predicted two-way interactions were statistically significant (see Table 11 and Figure 6). Higher scores on the Rewarding subscale are associated more positively with rated importance of the Incentivizing goal than rated importance of the Redistribution goal and the Risk-pooling goal. Higher scores on the Rigged subscale are associated more positively with rated importance of the Redistribution goal than rated importance of the Incentivizing goal and the Risk-pooling goal. Higher scores on the Random subscale are associated more positively with rated importance of the Risk-pooling goal than rated importance of the Incentivizing goal. The one predicted interaction for which we find no support is between the Random subscale and rated importance of the Risk-pooling goal compared to the Redistribution goal. Table 11 shows that we find similar results when controlling for the effect of political ideology and its interaction with rated importance of each of the three government goals. We present a similar analysis of absolute rather than signed associations in the Supplemental Material.

Table 11

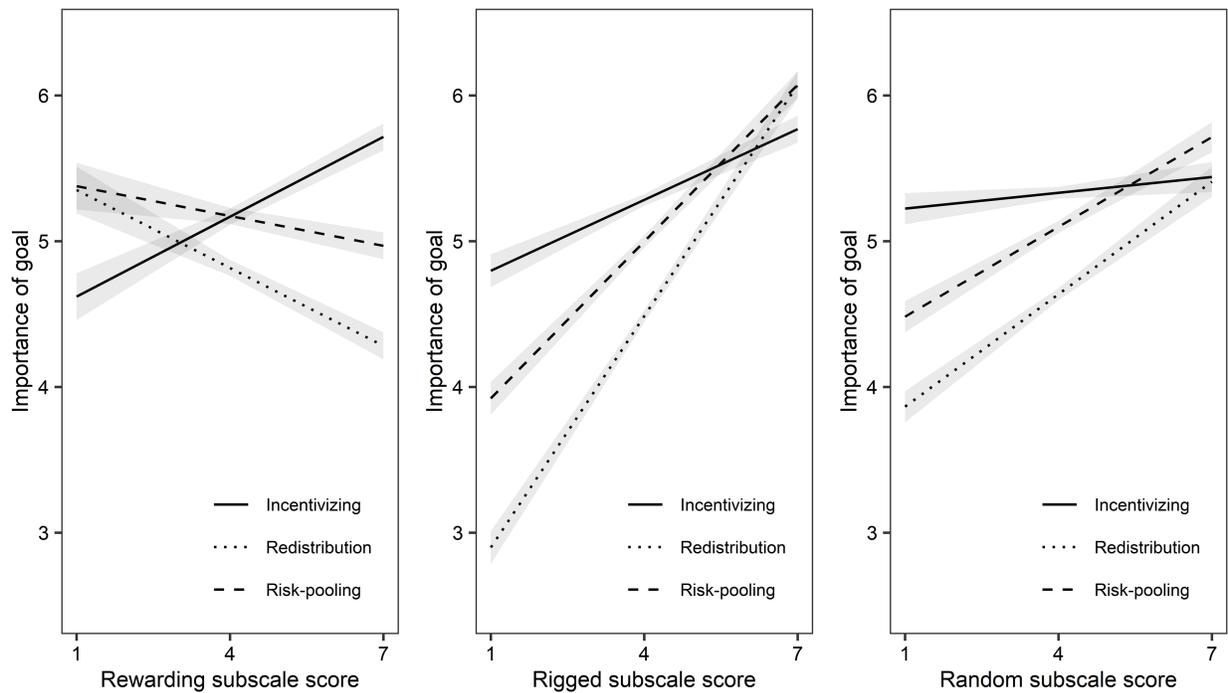
Mixed Model Results for Fixed Effects of Interest on Rated Importance of Government Goals in Study 2, Controlling for the Effect of Political Ideology and Its Interaction with Government Goal in Model 2.

Effect	Model 1		Model 2	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.06 [-0.02, 0.13]	0.04	0.13 [0.06, 0.21]	0.09 **
Rigged	0.29 [0.22, 0.35]	0.23 ***	0.21 [0.14, 0.27]	0.17 ***
Random	0.01 [-0.06, 0.08]	0.01	0.02 [-0.05, 0.08]	0.01
Political ideology			-0.17 [-0.22, -0.12]	-0.19 ***
Pool vs. Inc	-0.16 [-0.67, 0.35]	-0.14	0.06 [-0.48, 0.59]	-0.14
Red vs. Inc	-0.80 [-1.31, -0.29]	-0.43 **	-0.23 [-0.76, 0.30]	-0.43
Red vs. Pool	-0.64 [-1.15, -0.13]	-0.29 *	-0.29 [-0.82, 0.25]	-0.29
Rewarding \times Pool vs. Inc	-0.21 [-0.28, -0.14]	-0.14 ***	-0.19 [-0.26, -0.11]	-0.13 ***
Rewarding \times Red vs. Inc	-0.30 [-0.37, -0.23]	-0.21 ***	-0.23 [-0.31, -0.16]	-0.16 ***
Rewarding \times Red vs. Pool	-0.09 [-0.16, -0.02]	-0.06 *	-0.05 [-0.12, 0.03]	-0.03
Rigged \times Pool vs. Inc	0.15 [0.08, 0.21]	0.12 ***	0.12 [0.05, 0.19]	0.10 ***
Rigged \times Red vs. Inc	0.32 [0.25, 0.38]	0.26 ***	0.24 [0.18, 0.31]	0.20 ***
Rigged \times Red vs. Pool	0.17 [0.11, 0.23]	0.14 ***	0.12 [0.06, 0.19]	0.10 ***
Random \times Pool vs. Inc	0.08 [0.02, 0.15]	0.07 *	0.08 [0.02, 0.15]	0.07 *
Random \times Red vs. Inc	0.06 [-0.01, 0.12]	0.05	0.06 [-0.01, 0.12]	0.05
Random \times Red vs. Pool	-0.03 [-0.09, 0.04]	-0.02	-0.02 [-0.09, 0.04]	-0.02
Pol. id. \times Pool vs. Inc			-0.06 [-0.11, -0.01]	-0.07 *
Pol. id. \times Red vs. Inc			-0.17 [-0.21, -0.12]	-0.19 ***
Pol. id. \times Red vs. Pool			-0.11 [-0.15, -0.06]	-0.12 ***
Intercept	3.78 [3.24, 4.31]	***	4.33 [3.79, 4.87]	***
Observations	3621		3612	
Pseudo R^2 (fixed effects)	.21		.28	

Note. Shaded rows indicate predicted interactions. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 6

Effect of Rewarding, Rigged, and Random Subscales on Rated Importance of Each of the Three Government Goals, Controlling for Political Ideology (Study 2). Bands indicate standard errors.



Discussion

Study 2 shows that Rewarding, Rigged, and Random beliefs uniquely predict rated importance of Incentivizing, Redistribution, and Risk-Pooling goals for social welfare policy, respectively. While Study 1 showed an association between these lay theories and political ideology, the compatibility effect observed in Study 2 remained strikingly similar when controlling for the effect of political ideology. We now turn to an exploration of how people’s beliefs about changes in financial well-being predict the appeal of different policy messages and political candidates, controlling for political ideology.

Study 3

In Study 3 we asked participants to report the extent to which different types of arguments would increase or decrease their support for various social welfare policies such as a food-purchasing assistance program or universal health care. Each of the arguments we use is intended to highlight a different aspect of the proposed social welfare policy. These arguments follow logically from the more general government goals found to be compatible with uncertainty beliefs in Study 2. Specifically, we predict that scores on the Rewarding subscale will be more positively associated with the persuasive impact of an Incentivizing argument, focusing on how the policy would enable and encourage people to work hard and make desirable life choices, compared to other arguments. Likewise, we predict that scores on the Rigged subscale will be more positively associated with the persuasive impact of a Redistribution argument, focusing on how the policy would restore or repair structural unfairness in society, compared to other arguments. Finally, we predict that scores on the Random subscale will be more positively associated with the persuasive impact of a Risk-pooling argument, focusing on how the policy would pool resources to protect all people against the risk of unforeseeable negative events, compared to other arguments.

Method

Participants

We recruited participants through Amazon's Mechanical Turk ($N = 517$; 54% female, $M_{\text{age}} = 34.83$, $SD_{\text{age}} = 14.55$). We aimed to recruit 500 participants and ended up with partial or complete data for 517 participants. We removed data of 14 participants before analyses because they did not give responses for all key variables.

Procedure & Materials

The survey consisted of three sections. In the first section, participants read short descriptions of four different public policy proposals: a more extensive disaster recovery program, a tuition-free higher education system, a more extensive food-purchasing assistance program, and a universal health coverage system. For instance, for the food-purchasing assistance program, participants read the following:

“Some policy makers favor a more extensive food purchasing assistance program (i.e., SNAP, or ‘food stamps’). This program provides targeted financial aid to help households purchase food. The program is paid for by the federal government. The use of food-purchasing assistance can be restricted to healthy foods (e.g., excluding alcohol, cigarettes, sugary foods and drinks), and can be made conditional on the recipient actively applying for work or participating in job-training.”

Each policy proposal was presented on a separate page and was followed by three different arguments in favor of the policy: (1) an Incentivizing argument, highlighting how the policy would provide assistance to those who deserve it most, thereby encouraging people to behave in a desired way (e.g. “A more extensive food-purchasing assistance program is a good idea because it would encourage recipients to actively look for work and to purchase healthy foods”); (2) a Redistribution argument, highlighting how the policy would provide assistance to the groups that need it most (e.g., “A more extensive food-purchasing assistance program is a good idea because it would provide financial assistance to those people who need it most, such as low-income, unemployed, homeless, or otherwise disadvantaged groups”); and (3) a Risk-pooling argument, highlighting how the policy would pool tax money to collectively pay in case an individual experiences an unexpected life event (e.g. “A more extensive food-purchasing assistance program is a good idea because it would pool tax-money and provide assistance to

every individual who experiences an unexpected life event (e.g., sudden unemployment, divorce, illness or disability) and cannot afford food”). As a measure of the *persuasive impact* of arguments we asked participants to rate the extent to which each argument made them more or less supportive of the proposed policy on an 11-point scale (-5 = “makes me much less supportive”; 0 = “makes me no more or less supportive”; +5 = “makes me much more supportive”). The policy descriptions and arguments were presented in an order that was randomized for each participant.

The second and third section of the survey were similar to Study 2. Participants completed the F-EARS and a series of demographic and political identity questions. See Table 3 for scale descriptive statistics and measures of internal consistency, and see the Supplemental Material for full details on procedures and measures.

Results

We specified a linear mixed model—which took each participant by policy argument rating as the unit of analysis (for a total of 6204 observations)—to treat participants as random effects. As fixed effects the model included scores on the three subscales of the F-EARS (Rewarding, Rigged, and Random), the policy argument (Incentivizing, Redistribution, and Risk-pooling), and the nine interactions between the three F-EARS subscales and three policy arguments.⁵ Our key prediction is that six of these nine interactions will be significant such that rating on a given F-EARS subscale (e.g., Rewarding) is more positively associated with persuasive impact of the most compatible policy argument (i.e., Incentivizing) than the two less compatible arguments (i.e., Redistribution and Risk-pooling). We make no prediction concerning the relative

⁵ To interpret the nature of the interaction effects, we run the same mixed model twice with different reference levels for the factor argument: once with Risk-pooling argument as reference level and once with Incentivizing argument as reference level.

associations between the policy arguments hypothesized to be less compatible with a given F-EARS subscale.

The results of this analysis show that all six predicted two-way interactions were statistically significant (see Table 12 and Figure 7). Higher scores on the Rewarding subscale are associated more positively with persuasive impact of the Incentivizing argument than persuasive impact of the Redistribution argument and the Risk-pooling argument. Higher scores on the Rigged subscale are associated more positively with persuasive impact of the Redistribution argument than persuasive impact of the Incentivizing argument and the Risk-pooling argument. Higher scores on the Random subscale are associated more positively with persuasive impact of the Risk-pooling argument than persuasive impact of the Incentivizing argument and the Redistribution argument. Table 12 shows that we find similar results when controlling for the effect of political ideology and its interaction with persuasive impact of each of the policy arguments. We present a similar analysis of absolute rather than signed associations in the Supplemental Material.

Table 12

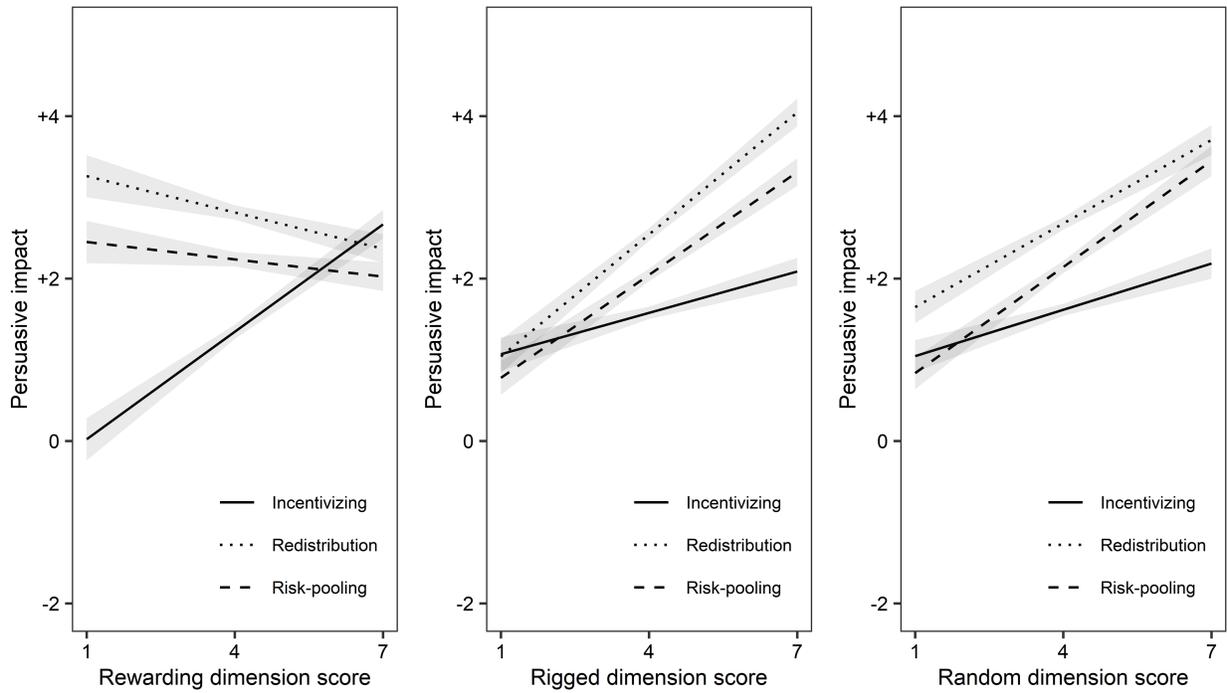
Mixed Model Results for Fixed Effects of Interest on Persuasive Impact of Policy Arguments in Study 3, Controlling for the Effect of Political Ideology and its Interaction with Policy Argument in Model 2.

Effect	Model 1		Model 2	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.33 [0.20, 0.45]	0.15 ***	0.36 [0.23, 0.48]	0.17 ***
Rigged	0.24 [0.12, 0.36]	0.13 ***	0.20 [0.08, 0.33]	0.11 **
Random	0.16 [0.03, 0.28]	0.08 *	0.16 [0.04, 0.29]	0.08 *
Political ideology			-0.00 [-0.01, 0.00]	-0.04
Pool vs. Inc	0.25 [0.86, 2.26]	0.22 ***	0.25 [1.43, 2.86]	0.22 ***
Red vs. Inc	0.39 [1.83, 3.22]	0.43 ***	0.39 [2.45, 3.88]	0.43 ***
Red vs. Pool	0.97 [0.27, 1.67]	0.21 **	1.03 [0.31, 1.74]	0.21 **
Edu vs. Dis	1.56 [0.11, 0.38]	0.10 ***	2.14 [0.13, 0.39]	0.10 ***
Food vs. Dis	2.53 [0.12, 0.38]	0.10 ***	3.17 [0.12, 0.39]	0.10 ***
Hea vs. Dis	0.24 [0.25, 0.52]	0.15 ***	0.26 [0.26, 0.52]	0.16 ***
Rewarding \times Pool vs. Inc	-0.48 [-0.58, -0.38]	-0.22 ***	-0.38 [-0.48, -0.27]	-0.17 ***
Rewarding \times Red vs. Inc	-0.56 [-0.66, -0.46]	-0.26 ***	-0.44 [-0.55, -0.34]	-0.21 ***
Rewarding \times Red vs. Pool	-0.08 [-0.18, 0.02]	-0.04	-0.07 [-0.17, 0.04]	-0.03
Rigged \times Pool vs. Inc	0.16 [0.06, 0.26]	0.08 **	0.04 [-0.06, 0.14]	0.02
Rigged \times Red vs. Inc	0.29 [0.20, 0.39]	0.16 ***	0.16 [0.06, 0.27]	0.09 **
Rigged \times Red vs. Pool	0.13 [0.04, 0.23]	0.07 **	0.12 [0.02, 0.23]	0.07 *
Random \times Pool vs. Inc	0.13 [0.03, 0.23]	0.07 *	0.16 [0.05, 0.26]	0.08 **
Random \times Red vs. Inc	-0.03 [-0.13, 0.07]	-0.01	-0.00 [-0.10, 0.10]	0.00
Random \times Red vs. Pool	-0.16 [0.26, -0.06]	-0.08 **	-0.16 [-0.26, -0.06]	-0.08 **
Pol. id. \times Pool vs. Inc			-0.02 [-0.02, -0.01]	-0.17 ***
Pol. id. \times Red vs. Inc			-0.02 [-0.02, -0.01]	-0.19 ***
Pol. id. \times Red vs. Pool			-0.00 [-0.01, 0.00]	-0.02
Intercept	4.21 [3.34, 5.08]	***	4.36 [3.48, 5.23]	***
Observations	6203		6191	
Pseudo R^2 (fixed effects)	.12		.15	

Note. Shaded rows indicate predicted interactions. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 7

Effect of Rewarding, Rigged, and Random Subscales on Persuasive Impact of Each of the Three Policy Arguments, Controlling for Political Ideology (Study 3). Bands indicate standard errors.



Discussion

Study 3 shows that people with different lay theories about changes in financial well-being are persuaded by different arguments in favor of various social welfare policies. In particular, we find that Incentivizing arguments are especially persuasive to people scoring high (versus low) on the Rewarding subscale; Redistribution arguments are especially persuasive to people scoring high (versus low) on the Rigged subscale; and Risk-pooling arguments are especially persuasive to people scoring high (versus low) on the Random subscale.

Study 4

In Study 3 we demonstrated argument compatibility effects in the context of specific policies. We now turn to the question of whether these effects extend to support for political candidates who speak about multiple policies in ways that accord with lay theories about changes in financial well-being.

Method

Participants

We recruited participants through Amazon's Mechanical Turk ($N = 836$; 57% female, $M_{\text{age}} = 34.34$, $SD_{\text{age}} = 11.12$). We aimed to recruit 1200 participants and ended up with partial or complete data for 1283 participants. We removed data of 50 participants before analyses because they did not give responses for all key variables. Also, because this study required participants to read a greater number of arguments per response than previous studies, we preregistered a plan to remove participants who spent less than 15 seconds reading at least one of the three candidates' statements. This led us to remove data of an additional 397 participants.

Procedure & Materials

In the first section of the survey, we asked participants to imagine that they would be choosing between three political candidates in a local election. We presented participants with each candidate's views concerning higher education, disaster recovery, and food purchasing assistance. One candidate articulated Incentivizing arguments for all three policies, stating that government programs should encourage desirable behavior by helping people who deserve it most (e.g., "The government should improve the higher education system by giving financial support to students, conditional on their academic performance. This way, the system would provide financial incentives to successful students who deserve it most, thereby motivating all students to work hard and strive for excellence.") A second candidate articulated Redistribution

arguments, stating that government programs should use tax money to help disadvantaged groups in society (e.g., “The government should invest tax money to improve the higher education system, by providing financial support to students from disadvantaged backgrounds or from low income households. In other words, the system should assist those who would otherwise not have the means to pay for higher education.”) A third candidate articulated Risk-pooling arguments, stating that government programs should pool tax-money to cover for the risk of unfortunate events (e.g., “The government should improve the higher education system by creating a large pool of money which can be used to collectively pay for the education of every individual, regardless of whether arbitrary circumstances have left them more or less able to pay.”) We labeled candidates generically (“Candidate A,” “Candidate B,” and “Candidate C.”)

We asked participants to rate the extent to which they would oppose or support this candidate in a local election on an 11-point scale (-5 = “strongly oppose”; 0 = “neither oppose nor support”; +5 = “strongly support”). The candidates were presented and evaluated on separate pages and in an order that was randomized for each participant. Next, on a separate page, we reminded participants of their prior candidate evaluations, and gave participants the option to re-read all arguments and then asked them, “If you would have to choose between these three, which candidate would you vote for?”

The second and third sections of the survey were similar to the previous studies. Participants completed the F-EARS and a series of demographic and political identity items. See Table 3 for scale descriptive statistics and measures of internal consistency, and see the Supplemental Material for full details on procedures and measures.

Results

Confirmatory Analyses

We specified a linear mixed model—which took each participant by candidate rating as the unit of analysis (for a total of 2508 observations)—to treat participants as random effects. As fixed effects the model included scores on the three subscales of the F-EARS (Rewarding, Rigged, and Random), the candidate (Incentivizing, Redistribution, and Risk-pooling), and the nine interactions between the three F-EARS subscales and three candidates.⁶ Our key prediction is that six of these nine interactions will be significant such that rating on a given F-EARS subscale (e.g., Rewarding) is more positively associated with rated support for the most compatible candidate (i.e., Incentivizing) than the two less compatible candidates (i.e., Redistribution and Risk-pooling). We make no prediction concerning the relative associations between the candidates hypothesized to be less compatible with a given F-EARS subscale.

The results of this analysis show that five of the six predicted two-way interactions were statistically significant (see Table 13 and Figure 8). Higher scores (versus lower) on the Rewarding subscale are associated more positively with rated support for the Incentivizing candidate than the Redistribution candidate and the Risk-pooling candidate. Higher scores (versus lower) on the Rigged subscale are associated more positively with rated support for the Redistribution candidate than the Incentivizing candidate. Higher scores (versus lower) on the Random subscale are associated more positively with rated support for the Risk-pooling candidate than the Incentivizing candidate and the Redistribution candidate. The one predicted interaction for which we find no support is between the Rigged subscale and rated support for the Redistribution candidate compared to the Risk-pooling candidate. Table 13 shows that we find a qualitatively identical pattern when controlling for the effect of political ideology and its

⁶ To interpret the nature of the interaction effects, we run the same mixed model twice with different reference levels for the factor candidate: once with Risk-pooling candidate as reference level and once with Incentivizing candidate as reference level.

interaction with rated support for each of the three candidates. We present a similar analysis of absolute rather than signed associations in the Supplemental Material.

Table 13

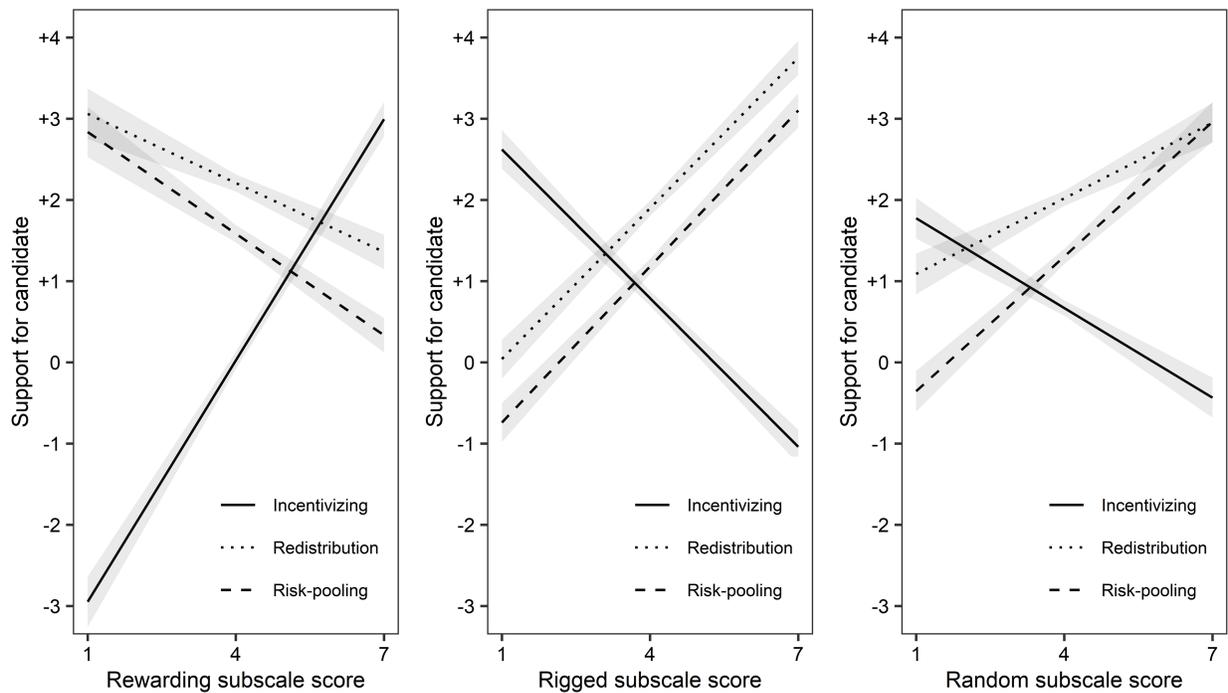
Mixed Model Results for Fixed Effects of Interest on Rated Support for Candidates in Study 4, Controlling for the Effect of Political Ideology and its Interaction with Candidate in Model 2.

Effect	Model 1		Model 2	
	<i>b</i> [95% <i>CI</i>]	β	<i>b</i> [95% <i>CI</i>]	β
Rewarding	0.76 [0.61, 0.92]	0.31 ***	0.57 [0.41, 0.72]	0.23 *
Rigged	-0.39[-0.53, -0.25]	-0.19 ***	-0.17[-0.32, -0.03]	-0.08 ***
Random	0.01 [-0.14, 0.17]	0.01	0.05 [-0.10, 0.19]	0.02 ***
Political ideology			0.47 [0.35, 0.58]	0.28 ***
Pool vs. Inc	0.62 [-0.94, 2.17]	0.23	4.46 [2.83, 6.08]	0.23 ***
Red vs. Inc	1.53 [-0.03, 3.08]	0.49	5.48 [3.85, 7.10]	0.49 ***
Red vs. Pool	0.91 [-0.65, 2.46]	0.25	1.02 [-0.61, 2.64]	0.25
Rewarding \times Pool vs. Inc	-1.11[-1.33, -0.90]	-0.46 ***	-0.73[-0.95, -0.51]	-0.30 ***
Rewarding \times Red vs. Inc	-1.01[-1.23, -0.79]	-0.41 ***	-0.61[-0.83, -0.39]	-0.25 ***
Rewarding \times Red vs. Pool	0.11 [-0.11, 0.32]	0.04	0.12 [-0.10, 0.33]	0.05
Rigged \times Pool vs. Inc	0.94 [0.74, 1.14]	0.46 ***	0.50 [0.29, 0.70]	0.24 ***
Rigged \times Red vs. Inc	1.04 [0.84, 1.23]	0.50 ***	0.58 [0.37, 0.78]	0.28 ***
Rigged \times Red vs. Pool	0.10 [-0.10, 0.29]	0.05	0.08 [-0.12, 0.28]	0.04
Random \times Pool vs. Inc	0.31 [0.09, 0.53]	0.14 *	0.23 [0.03, 0.44]	0.10 *
Random \times Red vs. Inc	0.04 [-0.18, 0.26]	0.02 *	-0.03 [-0.24, 0.17]	-0.01
Random \times Red vs. Pool	-0.27[-0.49, -0.05]	-0.12 *	-0.27[-0.48, -0.06]	-0.12 *
Pol. id. \times Pool vs. Inc			-0.95 [-1.12, -0.79]	-0.58 ***
Pol. id. \times Red vs. Inc			-0.98 [-1.14, -0.82]	-0.59 ***
Pol. id. \times Red vs. Pool			-0.03 [-0.19, 0.13]	-0.02
Intercept	4.70 [3.60, 5.80]	***	2.88 [1.73, 4.04]	***
Observations	2508		2499	
Pseudo R^2 (fixed effects)	.19		.25	

Note. Shaded rows indicate predicted interactions. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 8

Effect of Rewarding, Rigged, and Random Subscales on Rated Support for each of the Three Political Candidates, Controlling for Political Ideology (Study 4). Bands indicate standard errors.



Exploratory Analyses

To explore the effect of Rewarding, Rigged, and Random subscales on voting, we conducted three separate binary logistic regressions, one for whether or not participants voted for each candidate. The results in Table 14 show that scores on the Rewarding subscale are positively associated with the likelihood of voting for the Incentivizing candidate; scores on the Rigged subscale are positively associated with the likelihood of voting for the Redistribution candidate; scores on the Random subscale are positively associated with the likelihood of voting

for the Risk-pooling candidate. An analysis using multinomial logistic regression is presented in the Supplemental Material.

Table 14

Binary Logistic Regression Results for the Effects of F-EARS Subscales on Likelihood of Voting for Each Candidate in Study 4.

Incentivizing candidate						
Effect	<i>b</i>	<i>SE</i>	χ^2	<i>p</i>	OR	95% <i>CI</i> OR
Rewarding	0.47	0.08	38.40	< .001	1.60	[1.38, 1.86]
Rigged	-0.36	0.07	29.58	< .001	0.70	[0.62, 0.80]
Random	-0.18	0.07	6.31	.012	0.84	[0.73, 0.96]
Redistribution candidate						
Effect	<i>b</i>	<i>SE</i>	χ^2	<i>p</i>	OR	95% <i>CI</i> OR
Rewarding	-0.17	0.07	6.54	.011	0.85	[0.74, 0.96]
Rigged	-0.23	0.06	15.33	< .001	1.27	[1.13, 1.43]
Random	-0.01	0.07	0.03	.856	0.99	[0.87, 1.12]
Risk-pooling candidate						
Effect	<i>b</i>	<i>SE</i>	χ^2	<i>p</i>	OR	95% <i>CI</i> OR
Rewarding	-0.25	0.07	13.65	< .001	0.78	[0.68, 0.89]
Rigged	0.11	0.06	3.10	.078	1.12	[0.99, 1.27]
Random	0.20	0.07	8.33	.004	1.22	[1.07, 1.40]

Discussion

In Studies 2 and 3 we established that Incentivizing, Redistribution, and Risk-pooling goals and arguments are compatible with beliefs along Rewarding, Rigged, and Random dimensions,

respectively. Study 4 extends this insight concerning argument-belief compatibility to predict which political candidate people will support.

General Discussion

People vary in their lay theories about what causes changes in financial well-being over time, and these beliefs are closely associated with our political and policy preferences. In four preregistered studies using a total of $N = 3662$ participants, we find that individual differences in beliefs about changes in financial well-being are reliably captured along three dimensions that we label Rewarding, Rigged, and Random. We measure such beliefs using a new 9-item scale called the Financial Epistemic-Aleatory Rating Scale (F-EARS) that loads on these three dimensions. Whereas political conservatives tend to see changes in financial well-being as more knowable and based on individual factors such as effort (Rewarding), liberals tend to see these changes as both more knowable due to systemic factors such as discrimination and favoritism (Rigged), and as governed more by chance factors (Random). Furthermore, we find evidence for compatibility effects in the messaging about social welfare policies. Messages favoring social welfare policies are more persuasive to the extent that they contain arguments that are compatible with the target audience's lay theories about changes in financial well-being. Incentivizing policy arguments are more persuasive to people who score higher on the Rewarding subscale; Redistribution arguments are more persuasive to people who score higher on the Rigged subscale; and Risk-pooling arguments are more persuasive to people who score higher on the Random subscale.

Preferences concerning financial redistribution policy are complex and derive from multiple sources. Current self-interest certainly plays a role. Some authors have argued that preferences concerning redistribution derive from people's assessment of how redistribution will

affect them financially, either now or in the future (Benabou & Ok, 2001; Meltzer & Richard, 1981; Piketty, 1995). Moreover, people in the US with a household income below \$50,000 prefer a more equal distribution of wealth than those with a household income above \$100,000 (Norton & Ariely, 2011). Meanwhile, the wealthiest 5% of Americans have been found to prefer lower rates for top income tax and estate tax as compared to the general population (Cohn et al., 2019).

This said, one's current financial status cannot fully explain disagreements concerning economic redistribution and social welfare policy. Although the poor are generally more in favor of redistribution, they tend to hold less favorable views of redistribution to the extent that they see opportunities to move up the economic ladder (Alesina & La Ferrara, 2005; Bjørnskov et al., 2013; Shariff et al., 2016). People also care about the process through which the distribution is determined, even if they themselves have no stake in the matter (Almås et al., 2020; Cohn et al., 2019; Fisman, et al., 2015; Fisman, et al., 2017; Starmans et al., 2017; Trump, 2020; Tyler, 2011).

A more complete understanding of the sources of policy preferences requires an accurate model of how people think about changes in financial well-being. The findings in this article confirm a model that combines perceptions of individual control with a distinction between the perceived knowability and perceived randomness of uncertainty in financial well-being, yielding a three-dimensional model. Importantly, these lay theories predict support for different candidates and messages, even when controlling for self-interest (as indicated by income and other demographics) and political ideology.

The Emergence of Lay Theories About Financial Well-being

People's lay beliefs about what causes financial well-being to change over time may or may not accord with objective causes and are largely influenced by subjective interpretation. For

instance, if an able-bodied individual gets poorer because he does not work very hard, an observer may see this as laziness in a system that is inherently rewarding. Alternatively, an observer may construe this behavior as the result of the individual being frustrated by a system that is rigged against him and has repeatedly thwarted his previous attempts to get ahead. Finally, an observer may see this behavior as the result of bad luck in having been born with traits that are not rewarded in life—losing what Warren Buffet once referred to as the “ovarian lottery” (Weisenthal, 2013). Of course, these attributions are not mutually exclusive and may vary in their relative salience; as we have shown, perceptions of causes of change in financial well-being vary along three independent dimensions.

There is ample evidence that people’s experiences shape the way they view the structure of society, including the causes of changes and differences in financial well-being (Browman et al., 2019; Hunt, 1996; Kunovich & Slomczynski, 2007; Manstead, 2018; McCall et al., 2017; Mijs, 2018, 2019; Shariff et al., 2016). Of course, individuals’ views of economic inequality and mobility may be systematically biased (Alesina et al., 2018; Cruces, et al., 2013; Davidai & Gilovich, 2015; Hauser & Norton, 2017; Kraus et al., 2017; Kraus & Tan, 2015; Kiatpongsan & Norton, 2014; Norton & Ariely, 2011; Norton, et al., 2014). For instance, Americans’ underestimation of inequality in their country may cause them to overestimate the degree of economic mobility, due to a greater perception that economic outcomes are within an individual’s control (Davidai, 2018). Lay theories may derive from a need to rationalize inequality, fulfilling a basic psychological need to understand and explain the world around us (Benabou & Tirole, 2006; Day & Fiske, 2017; Jost et al., 2004; Kraus & Tan, 2015; Piff et al., 2018; Trump, 2018; Trump & White, 2018).

Future research could further investigate how personal history and context shape individual differences on the Rewarding, Rigged, and Random dimensions. Recent macroeconomic trends could be systematically related to the distribution of lay theories about changes in financial well-being. For instance, following recessions more people may come to view the system as less inherently rewarding. Alternatively, individual experience may lead people to shift their lay beliefs over time. For instance, a person suddenly knocked into poverty by a natural disaster may come to appreciate the critical role of randomness in determining changes in financial well-being. Finally, one might imagine that contextual cues could temporarily shift people's lay theories. For instance, news about protests against discrimination may cause some individuals to temporarily appreciate the extent to which the system is rigged. Indeed, in one study, after participants were prompted to consider why some people are poor for reasons beyond their control, they came to favor egalitarian and redistributive policies (Piff et al., 2020).

Crafting Persuasive Policy Messages

In this article we have demonstrated that understanding people's lay theories of change in financial well-being can inform the design of more persuasive policy messages. We identified specific policy arguments that are compatible with each dimension and demonstrated how these arguments can be put to use in the political arena. A natural next step would be to test whether or not these insights can be used to win over specific groups of voters and build coalitions.

Effective targeted messaging requires an ability to identify individual beliefs along the Rewarding, Rigged, and Random dimensions, preferably based on publicly available socio-demographic variables. As a preliminary exploration of this approach we examined data from Study 1, conducting a series of linear regressions with Rewarding, Rigged, and Random scores

as the dependent variables and the full set socio-demographic characteristics as predictors.⁷ The strongest predictor of the Rewarding subscale was higher rated importance of religion ($\beta = 0.18$, $p < .001$). Meanwhile, the strongest predictor of the Random subscale was lower household income ($\beta = -0.10$, $p = .007$). Interestingly, the strongest predictor of the Rigged dimension was marital status ($\beta = -0.09$, $p = .013$); participants who were not married scored higher on the Rigged subscale. While these results provide a first hint about how specific groups might be targeted, further research is needed to identify differences in lay beliefs about financial well-being from combinations of observable variables.

One obvious way of identifying subgroups for tailored messaging opportunities is based on political ideology and/or political party affiliation. As we have shown, conservatives, on average, believe that changes in financial well-being are more Rewarding, less Rigged, and slightly less Random, as compared to liberals. Thus, when the goal is to persuade conservatives to support a particular social welfare policy, it may be most persuasive to emphasize an Incentivizing message about how the policy would create opportunities for hard-working individuals to prosper without allowing non-deserving individuals to take advantage. In contrast, when the goal is to persuade liberals to support the same social welfare policy, it may be most persuasive to either emphasize a redistribution message about how the policy would repair structural inequalities by helping routinely disadvantaged groups in society, or emphasize a risk-pooling message about how the policy would collectively insure everyone against the risk of unforeseeable negative outcomes.

In the current studies we find preliminary evidence that people of different political ideologies indeed respond differently to policy messages. Figure 9 shows the effect of political

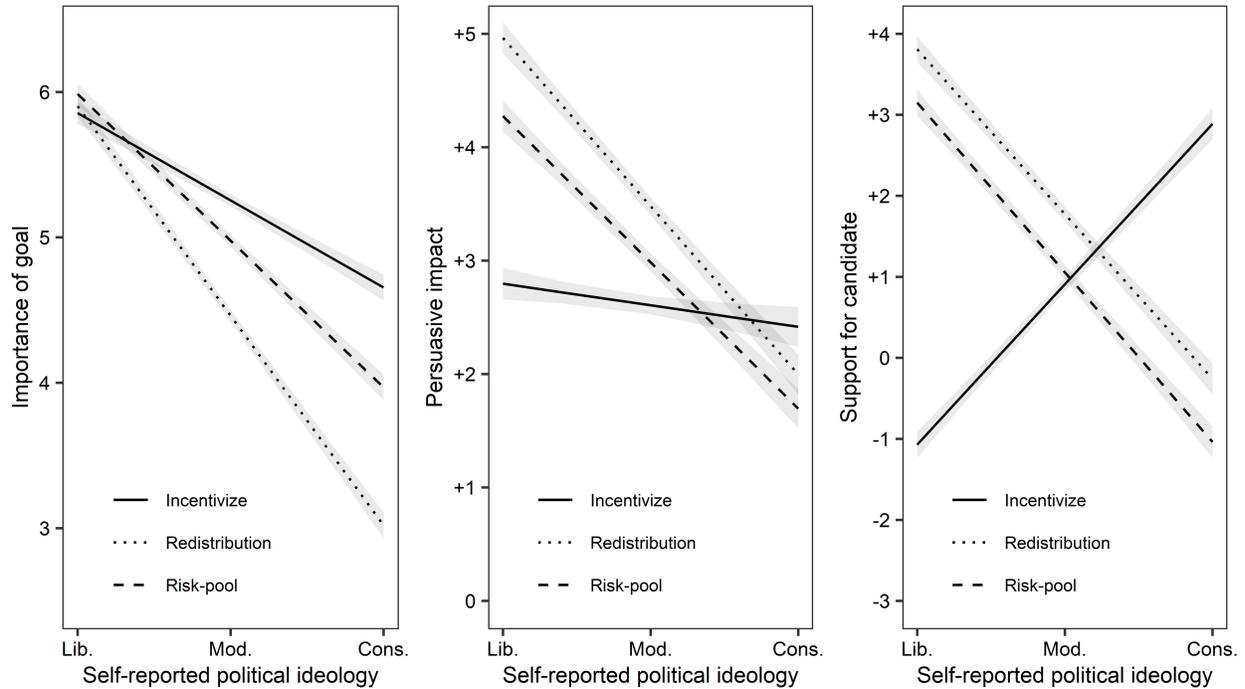
⁷ See the Supplemental Material for complete results of these analyses.

ideology on the different dependent variables used in Studies 2-4. It is easy to see from the Figure that Incentivizing messages tended to garner more support from the most conservative individuals than Risk-Pooling and Redistribution messages for government intervention (Study 2), various social welfare policies (Study 3), and political candidates (Study 4).

Targeted messaging to different audiences is not always a feasible or preferable strategy. This raises the question of whether or not it is possible to craft messages that combine all three elements that are uniquely attractive to people with different lay theories. Of course there could be a risk to combining messages. Adding elements to an otherwise persuasive message that are incompatible with the target audience's beliefs may backfire and undermine the message's effectiveness. That is, multiple simultaneous messages could provide something for each constituency to dislike rather than like. Early indications suggest this may not be the case: in a preliminary exploration of this phenomenon we found that messages that combine Incentivizing, Redistribution, and Risk-pooling elements generally broaden support over messages that contain only one of these elements (Bogard et al., 2020).

Figure 9

Effect of Political Ideology on Importance Rating of Government Goals (Study 2, Left Panel), on Persuasive Impact of Policy Arguments (Study 3, Middle Panel), and on Rated Support for Political Candidates (Study 4, Right Panel). Bands indicate standard errors.



Bridging the Divide on Social Welfare Policy

The present findings provide some guidance concerning not only how to more effectively customize messages to different groups, but also on how to enhance the appeal of any given policy to a broader audience and thus help bridge the political divide. When people disagree about a particular policy, this disagreement may stem in part from a failure to define what exactly the policy entails—who it helps, on what basis, and with what purpose. It may be possible to draw opinions closer together by highlighting different aspects of a policy in a way that speaks to multiple lay theories of change in financial well-being. For instance, previous research finds that supporters and opponents of affirmative action had different kinds of policies in mind when judging the matter, but that most people from both sides were in favor of an affirmative action policy when it was made clear how that policy upheld the (incentivizing) principle of merit (Reyna et al., 2005). Similarly, disagreements regarding social welfare

policies—from subsidized health care and tuition-free education to food stamps and unemployment benefits—may also arise from a lack of shared understanding about such policies. This leaves open the possibility of using a broader combination of policy messages that speak to multiple lay theories of change in financial well-being to bridge the political divide.

Ideological and attitudinal divides also exist between people from different countries. There is considerable variance in the level and type of welfare spending across countries (Alber, 2010; Alesina et al., 2001; Schwabish et al., 2006), just as there is variance in public views on economic inequality (Kerr, 2014; Kiatpongsan & Norton, 2014; Osberg & Smeeding, 2006; Piff et al., 2020; Reeskens & Van Oorschot, 2013). Past research has connected these differences to how people in different countries think about the role of luck and effort in determining economic outcomes (Alesina & Glaeser, 2004). Future research could revisit this issue for a more detailed examination of how countries differ in their respective distributions of Rewarding, Rigged, and Random beliefs. Such an examination provides some insight into why countries invest in different social welfare policies, why particular political candidates or parties are more popular in one country than in another, and how consensus regarding social welfare policies can be reached across communities with different beliefs, attitudes, and preferences.

References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, white women. *Health Psychology, 19*(6), 586–592.
<https://doi.org/10.1037/0278-6133.19.6.586>
- Alber, J. (2010). What the European and American welfare states have in common and where they differ: Facts and fiction in comparisons of the European social model and the United States. *Journal of European Social Policy, 20*(2), 102–125.
<https://doi.org/10.1177/0958928709358791>
- Alesina, A., & Angeletos, G. M. (2005). Fairness and redistribution. *American Economic Review, 95*(4), 960–980. <https://doi.org/10.1257/0002828054825655>
- Alesina, A., Glaeser, E., & Sacerdote, B. (2001). Why doesn't the US have a European-style welfare system? *Brooking Papers on Economic Activity, 2001*(2), 187–277.
<https://doi.org/10.1353/eca.2001.0014>
- Alesina, A., & Glaeser, E. L. (2004). *Fighting poverty in the US and Europe: A world of difference*. Oxford University Press. <https://doi.org/10.1093/0199267669.003.0001>
- Alesina, A., & La Ferrara, E. (2005). Preferences for redistribution in the land of opportunities. *Journal of Public Economics, 89*(5–6), 897–931.
<https://doi.org/10.1016/j.jpubeco.2004.05.009>
- Alesina, A., Stantcheva, S., & Teso, E. (2018). Intergenerational mobility and preferences for redistribution. *American Economic Review, 108*(2), 521–54.
<https://doi.org/10.1257/aer.20162015>

- Almås, I., Cappelen, A. W., & Tungodden, B. (2020). Cutthroat capitalism versus cuddly socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians? *Journal of Political Economy*, *128*(5), 1753–1788. <https://doi.org/10.1086/705551>
- Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*. Jossey-Bass.
- Alvaredo, F., Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2018). *World inequality report*. Harvard University Press. <https://doi.org/10.4159/9780674984769>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. <http://doi.org/10.18637/jss.v067.i01>
- Benabou, R., & Ok, E. A. (2001). Social mobility and the demand for redistribution: The Poupou hypothesis. *The Quarterly Journal of Economics*, *116*(2), 447–487. <https://doi.org/10.1162/00335530151144078>
- Benabou, R., & Tirole, J. (2006). Belief in a just world and redistributive politics. *The Quarterly Journal of Economics*, *121*(2), 699–746. <https://doi.org/10.1162/qjec.2006.121.2.699>
- Bizumic, B., & Duckitt, J. (2018). Investigating right wing authoritarianism with a very short authoritarianism scale. *Journal of Social and Political Psychology*, *6*(1), 129–150. <https://doi.org/10.5964/jspp.v6i1.835>
- Bjørnskov, C., Dreher, A., Fischer, J. A., Schnellenbach, J., & Gehring, K. (2013). Inequality and happiness: When perceived social mobility and economic reality do not match. *Journal of Economic Behavior & Organization*, *91*, 75–92. <https://doi.org/10.1016/j.jebo.2013.03.017>

- Bobbio, A., Canova, L., & Manganelli, A. M. (2010). Conservative ideology, economic conservatism, and causal attributions for poverty and wealth. *Current Psychology, 29*(3), 222–234. <https://doi.org/10.1007/s12144-010-9086-6>
- Bogard, J., Ülkümen, G., Krijnen, J. M. T., & Fox, C. R. (2020). Political messaging and uncertainty beliefs. Manuscript in Preparation.
- Browman, A. S., Destin, M., Kearney, M. S., & Levine, P. B. (2019). How economic inequality shapes mobility expectations and behaviour in disadvantaged youth. *Nature Human Behaviour, 3*(3), 214–220. <https://doi.org/10.1038/s41562-018-0523-0>
- Bullock, H. E., Williams, W. R., & Limbert, W. M. (2003). Predicting support for welfare policies: The impact of attributions and beliefs about inequality. *Journal of Poverty, 7*(3), 35–56. https://doi.org/10.1300/j134v07n03_03
- Cappelen, A. W., Hole, A. D., Sørensen, E. Ø., & Tungodden, B. (2007). The pluralism of fairness ideals: An experimental approach. *American Economic Review, 97*(3), 818–827. <https://doi.org/10.1257/aer.97.3.818>
- Cappelen, A. W., Konow, J., Sørensen, E. Ø., & Tungodden, B. (2013). Just luck: An experimental study of risk-taking and fairness. *American Economic Review, 103*(4), 1398–1413. <https://doi.org/10.1257/aer.103.4.1398>
- Carey, J. M., & Paulhus, D. L. (2013). Worldview implications of believing in free will and/or determinism: Politics, morality, and punitiveness. *Journal of Personality, 81*(2), 130–141. <https://doi.org/10.1111/j.1467-6494.2012.00799.x>
- CFPB. (2015). Financial well-being: The goal of financial education. Retrieved from https://files.consumerfinance.gov/f/201501_cfpb_report_financial-well-being.pdf

- Chavanne, D. (2018). Headwinds, tailwinds, and preferences for income redistribution. *Social Science Quarterly*, 99(3), 851–871. <https://doi.org/10.1111/ssqu.12477>
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Cohn, A., Jessen, L. J., Klasnja, M., & Smeets, P. (2019). Why do the rich oppose redistribution? An experiment with America's top 5%. Available at SSRN 3395213. <https://doi.org/10.2139/ssrn.3395213>
- Cozzarelli, C., Wilkinson, A. V., & Tagler, M. J. (2001). Attitudes toward the poor and attributions for poverty. *Journal of Social Issues*, 57(2), 207–227. <https://doi.org/10.1111/0022-4537.00209>
- Cruces, G., Perez-Truglia, R., & Tetaz, M. (2013). Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment. *Journal of Public Economics*, 98, 100–112. <https://doi.org/10.1016/j.jpubeco.2012.10.009>
- Dalbert, C. (1999). The world is more just for me than generally: About the personal belief in a just world scale's validity. *Social Justice Research*, 12(2), 79–98. <https://doi.org/10.1023/A:1022091609047>
- Davidai, S. (2018). Why do Americans believe in economic mobility? Economic inequality, external attributions of wealth and poverty, and the belief in economic mobility. *Journal of Experimental Social Psychology*, 79, 138–148. <https://doi.org/10.1016/j.jesp.2018.07.012>

- Davidai, S., & Gilovich, T. (2015). Building a more mobile America—One income quintile at a time. *Perspectives on Psychological Science, 10*(1), 60–71.
<https://doi.org/10.1177/1745691614562005>
- Day, M. V., & Fiske, S. T. (2017). Movin' on up? How perceptions of social mobility affect our willingness to defend the system. *Social Psychological and Personality Science, 8*(3), 267–274. <https://doi.org/10.1177/1948550616678454>
- Day, M. V., Fiske, S. T., Downing, E. L., & Trail, T. E. (2014). Shifting liberal and conservative attitudes using moral foundations theory. *Personality and Social Psychology Bulletin, 40*(12), 1559–1573. <https://doi.org/10.1177/0146167214551152>
- Duckitt, J., & Sibley, C. G. (2010). Personality, ideology, prejudice, and politics: A dual-process motivational model. *Journal of Personality, 78*(6), 1861–1894.
<https://doi.org/10.1111/j.1467-6494.2010.00672.x>
- Everett, J. A., Clark, C. J., Meindl, P., Luguri, J. B., Earp, B. D., Graham, J., & Ditto, P. H. (2020). Political differences in free will belief are associated with differences in moralization. *Journal of Personality and Social Psychology*.
<https://doi.org/10.1037/pspp0000286>
- Feagin, J. R. (1972). Poverty: We still believe that God helps those who help themselves. *Psychology Today, 6*(6), 101–110.
- Feather, N. T. (1974). Explanations of poverty in Australian and American samples: The person, society, or fate? *Australian Journal of Psychology, 26*(3), 199–216.
<https://doi.org/10.1080/00049537408255231>

- Feinberg, M., & Willer, R. (2019). Moral reframing: A technique for effective and persuasive communication across political divides. *Social and Personality Psychology Compass*, 13(12), e12501. <https://doi.org/10.1111/spc3.12501>
- Fisman, R., Jakiela, P., & Kariv, S. (2017). Distributional preferences and political behavior. *Journal of Public Economics*, 155, 1–10. <https://doi.org/10.1016/j.jpubeco.2017.08.010>
- Fisman, R., Jakiela, P., Kariv, S., & Markovits, D. (2015). The distributional preferences of an elite. *Science*, 349(6254), aab0096–aab0096. <https://doi.org/10.1126/science.aab0096>
- Flake, J. K., Pek, J., & Hehman, E. (2017). Construct validation in social and personality research: Current practice and recommendations. *Social Psychological and Personality Science*, 8(4), 370–378. <https://doi.org/10.1177/1948550617693063>
- Fong, C. (2001). Social preferences, self-interest, and the demand for redistribution. *Journal of Public Economics*, 82(2), 225–246. [https://doi.org/10.1016/s0047-2727\(00\)00141-9](https://doi.org/10.1016/s0047-2727(00)00141-9)
- Fox, C. R., Goedde-Menke, M., & Tannenbaum, D. (2020). Ambiguity aversion and the perceived nature of uncertainty.
- Fox, C. R., Tannenbaum, D., Ülkümen, G., Walters, D. J., & Erner, C. (2020). Credit, blame, luck, and epistemic versus aleatory attributions of uncertainty.
- Fox, C. R., & Ülkümen, G. (2011). Distinguishing two dimensions of uncertainty. In W. Brun, G. Keren, G. Kirkebøen, & H. Montgomery (Eds.), *Perspectives on Thinking, Judging, and Decision Making* (pp. 21–35). Universitetsforlaget.
- Frank, R. H. (2016). *Success and luck: Good fortune and the myth of meritocracy*. Princeton University Press. <https://doi.org/10.1515/9781400880270>

- Furnham, A. (1982a). Why are the poor always with us? Explanations for poverty in Britain. *British Journal of Social Psychology*, 21(4), 311–322. <https://doi.org/10.1111/j.2044-8309.1982.tb00553.x>
- Furnham, A. (1982b). Explanations for unemployment in Britain. *European Journal of Social Psychology*, 12(4), 335–351. <https://doi.org/10.1002/ejsp.2420120402>
- Gallup. (1998). Have and have-nots: Perceptions of fairness and opportunity. Retrieved from <https://news.gallup.com/poll/9877/havenots-perceptions-fairness-opportunity-1998.aspx>.
- Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S., & Ditto, P. (2013). Moral foundations theory: The pragmatic validity of moral pluralism. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 55–130). Elsevier. <https://doi.org/10.1016/b978-0-12-407236-7.00002-4>
- Graham, J., Haidt, J., Motyl, M., Meindl, P., Iskiwitch, C., & Mooijman, M. (2018). Moral foundations theory: On the advantages of moral pluralism over moral monism. In K. Gray & J. Graham (Eds.), *The atlas of moral psychology: Mapping good and evil in the mind* (pp. 211–222). Guilford Press. <https://doi.org/10.1016/b978-0-12-407236-7.00002-4>
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, 96(5), 1029–1046. <https://doi.org/10.1037/a0015141>
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, 101(2), 366–385. <https://doi.org/10.1037/a0021847>

- Haidt, J., & Graham, J. (2007). When morality opposes justice: Conservatives have moral intuitions that liberals may not recognize. *Social Justice Research, 20*(1), 98–116.
<https://doi.org/10.1007/s11211-007-0034-z>
- Hardisty, D. J., Johnson, E. J., & Weber, E. U. (2010). A dirty word or a dirty world? Attribute framing, political affiliation, and query theory. *Psychological Science, 21*(1), 86–92.
<https://doi.org/10.1177/0956797609355572>
- Hauser, O. P., & Norton, M. I. (2017). (Mis)perceptions of inequality. *Current Opinion in Psychology, 18*, 21–25. <https://doi.org/10.1016/j.copsyc.2017.07.024>
- Henry, P. J., Reyna, C., & Weiner, B. (2004). Hate welfare but help the poor: How the attributional content of stereotypes explains the paradox of reactions to the destitute in America. *Journal of Applied Social Psychology, 34*(1), 34–58.
<https://doi.org/10.1111/j.1559-1816.2004.tb02536.x>
- Hirsh, J. B., DeYoung, C. G., Xu, X., & Peterson, J. B. (2010). Compassionate liberals and polite conservatives: Associations of agreeableness with political ideology and moral values. *Personality and Social Psychology Bulletin, 36*(5), 655–664.
<https://doi.org/10.1177/0146167210366854>
- Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., Foels, R., & Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new sdo₇ scale. *Journal of Personality and Social Psychology, 109*(6), 1003–1028.
<https://doi.org/10.1037/pspi0000033>
- Ho, A. K., Sidanius, J., Pratto, F., Levin, S., Thomsen, L., Kteily, N., & Sheehy-Skeffington, J. (2012). Social dominance orientation: Revisiting the structure and function of a variable

- predicting social and political attitudes. *Personality and Social Psychology Bulletin*, 38(5), 583–606. <https://doi.org/10.1177/0146167211432765>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Hunt, M. O. (1996). The individual, society, or both? A comparison of Black, Latino, and White beliefs about the causes of poverty. *Social Forces*, 75(1), 293–322. <https://doi.org/10.1093/sf/75.1.293>
- Hussey, I., & Hughes, S. (2020). Hidden Invalidity Among 15 Commonly Used Measures in Social and Personality Psychology. *Advances in Methods and Practices in Psychological Science*, 3(2), 166–184. <https://doi.org/10.1177/2515245919882903>
- Jost, J. T. (2017). Ideological asymmetries and the essence of political psychology. *Political Psychology*, 38(2), 167–208. <https://doi.org/10.1111/pops.12407>
- Jost, J. T., Banaji, M. R., & Nosek, B. A. (2004). A decade of system justification theory: Accumulated evidence of conscious and unconscious bolstering of the status quo. *Political Psychology*, 25(6), 881–919. <https://doi.org/10.1111/j.1467-9221.2004.00402.x>
- Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, 60, 307–337. <https://doi.org/10.1146/annurev.psych.60.110707.163600>
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129(3), 339–375. <https://doi.org/10.1037/0033-2909.129.3.339>

- Kay, A. C., & Jost, J. T. (2003). Complementary justice: Effects of “poor but happy” and “poor but honest” stereotype exemplars on system justification and implicit activation of the justice motive. *Journal of Personality and Social Psychology, 85*(5), 823–837.
<https://doi.org/10.1037/0022-3514.85.5.823>
- Kerr, W. R. (2014). Income inequality and social preferences for redistribution and compensation differentials. *Journal of Monetary Economics, 66*, 62–78.
<https://doi.org/10.1016/j.jmoneco.2014.03.002>
- Kiatpongsan, S., & Norton, M. I. (2014). How much (more) should CEOs make? A universal desire for more equal pay. *Perspectives on Psychological Science, 9*(6), 587–593.
<https://doi.org/10.1177/1745691614549773>
- Kidwell, B., Farmer, A., & Hardesty, D. M. (2013). Getting liberals and conservatives to go green: Political ideology and congruent appeals. *Journal of Consumer Research, 40*(2), 350–367. <https://doi.org/10.1086/670610>
- Kinder, D. R., & Kiewiet, D. R. (1979). Economic discontent and political behavior: The role of personal grievances and collective economic judgments in congressional voting. *American Journal of Political Science, 495–527*. <https://doi.org/10.2307/2111027>
- Kluegel, J. R., & Smith, E. R. (1986). *Beliefs about inequality: Americans' views of what is and what ought to be*. Taylor & Francis.
- Konow, J. (1996). A positive theory of economic fairness. *Journal of Economic Behavior & Organization, 31*(1), 13–35. [https://doi.org/10.1016/s0167-2681\(96\)00862-1](https://doi.org/10.1016/s0167-2681(96)00862-1)
- Konow, J. (2000). Fair shares: Accountability and cognitive dissonance in allocation decisions. *American Economic Review, 90*(4), 1072–1091. <https://doi.org/10.1257/aer.90.4.1072>

- Kraus, M. W., Rucker, J. M., & Richeson, J. A. (2017). Americans misperceive racial economic equality. *Proceedings of the National Academy of Sciences*, *114*(39), 10324–10331.
<https://doi.org/10.1073/pnas.1707719114>
- Kraus, M. W., & Tan, J. J. (2015). Americans overestimate social class mobility. *Journal of Experimental Social Psychology*, *58*, 101–111. <https://doi.org/10.1016/j.jesp.2015.01.005>
- Krawczyk, M. (2010). A glimpse through the veil of ignorance: Equality of opportunity and support for redistribution. *Journal of Public Economics*, *94*(1–2), 131–141.
<https://doi.org/10.1016/j.jpubeco.2009.10.003>
- Kunovich, S., & Slomczynski, K. M. (2007). Systems of distribution and a sense of equity: A multilevel analysis of meritocratic attitudes in post-industrial societies. *European Sociological Review*, *23*(5), 649–663. <https://doi.org/10.1093/esr/jcm026>
- Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest package: Tests in linear mixed effects models. *Journal of Statistical Software*, *82*(13), 1–26.
<https://doi.org/10.18637/jss.v082.i13>
- Lammers, J., & Baldwin, M. (2018). Past-focused temporal communication overcomes conservatives' resistance to liberal political ideas. *Journal of Personality and Social Psychology*, *114*(4), 599–619. <https://doi.org/10.1037/pspi0000121>
- Lepianka, D., Van Oorschot, W., & Gelissen, J. (2009). Popular explanations of poverty: A critical discussion of empirical research. *Journal of Social Policy*, *38*(3), 421–438.
<https://doi.org/10.1017/s0047279409003092>
- Lewis-Beck, M. S., & Stegmaier, M. (2000). Economic determinants of electoral outcomes. *Annual Review of Political Science*, *3*(1), 183–219.
<https://doi.org/10.1146/annurev.polisci.3.1.183>

- Manstead, A. S. (2018). The psychology of social class: How socioeconomic status impacts thought, feelings, and behaviour. *British Journal of Social Psychology*, *57*(2), 267–291. <https://doi.org/10.1111/bjso.12251>
- McCall, L., Burk, D., Laperrière, M., & Richeson, J. A. (2017). Exposure to rising inequality shapes Americans' opportunity beliefs and policy support. *Proceedings of the National Academy of Sciences*, *114*(36), 9593–9598. <https://doi.org/10.1073/pnas.1706253114>
- McCrae, R. R. (1996). Social consequences of experiential openness. *Psychological Bulletin*, *120*(3), 323–337. <https://doi.org/10.1037/0033-2909.120.3.323>
- Meltzer, A. H., & Richard, S. F. (1981). A rational theory of the size of government. *Journal of Political Economy*, *89*(5), 914–927. <https://doi.org/10.1086/261013>
- Mijs, J. J. (2018). Inequality is a problem of inference: How people solve the social puzzle of unequal outcomes. *Societies*, *8*(3), 64. <https://doi.org/10.3390/soc8030064>
- Mijs, J. J. (2019). The paradox of inequality: income inequality and belief in meritocracy go hand in hand. *Socio-Economic Review*, *39*, <https://doi.org/10.1093/ser/mwy051>
- Norton, M. I., & Ariely, D. (2011). Building a better America—one wealth quintile at a time. *Perspectives on Psychological Science*, *6*(1), 9–12. <https://doi.org/10.1177/1745691610393524>
- Norton, M. I., Neal, D. T., Govan, C. L., Ariely, D., & Holland, E. (2014). The not-so-common-wealth of Australia: Evidence for a cross-cultural desire for a more equal distribution of wealth. *Analyses of Social Issues and Public Policy*, *14*(1), 339–351. <https://doi.org/10.1111/asap.12058>

- Osberg, L., & Smeeding, T. (2006). “Fair” inequality? Attitudes toward pay differentials: The United States in comparative perspective. *American Sociological Review*, *71*(3), 450–473. <https://doi.org/10.1177/000312240607100305>
- Oxoby, R. J., & Spraggon, J. (2008). Mine and yours: Property rights in dictator games. *Journal of Economic Behavior & Organization*, *65*(3–4), 703–713. <https://doi.org/10.1016/j.jebo.2005.12.006>
- PEW. (2018). 2018 midterm voters: Issues and political values. Retrieved from <https://www.people-press.org/2018/10/04/2018-midterm-voters-issues-and-political-values>.
- Piff, P. K., Kraus, M. W., & Keltner, D. (2018). Unpacking the inequality paradox: The psychological roots of inequality and social class. In J. Olson (Ed.), *Advances in experimental social psychology* (Vol. 57, pp. 53–124). Academic Press. <https://doi.org/10.1016/bs.aesp.2017.10.002>
- Piff, P. K., Wiwad, D., Robinson, A. R., Aknin, L. B., Mercier, B., & Shariff, A. (2020). Shifting attributions for poverty motivates opposition to inequality and enhances egalitarianism. *Nature Human Behaviour*, *4*(5), 496–505. <https://doi.org/10.1038/s41562-020-0835-8>
- Piketty, T. (1995). Social mobility and redistributive politics. *The Quarterly Journal of Economics*, *110*(3), 551–584. <https://doi.org/10.230/2946692>
- Piketty, T., & Saez, E. (2014). Inequality in the long run. *Science*, *344*(6186), 838–843. <https://doi.org/10.1126/science.1251936>
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, *67*(4), 741–763. <https://doi.org/10.1037/0022-3514.67.4.741>

- Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review, 41*, 71–90. <https://doi.org/10.1016/j.dr.2016.06.004>
- R Core Team. (2018). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Reeskens, T., & Van Oorschot, W. (2013). Equity, equality, or need? A study of popular preferences for welfare redistribution principles across 24 European countries. *Journal of European Public Policy, 20*(8), 1174–1195. <https://doi.org/10.1080/13501763.2012.752064>
- Reyna, C., Tucker, A., Korfmacher, W., & Henry, P. (2005). Searching for common ground between supporters and opponents of affirmative action. *Political Psychology, 26*(5), 667–682. <https://doi.org/10.1111/j.1467-9221.2005.00438.x>
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36. Retrieved from <http://www.jstatsoft.org/v48/i02/>
- Saez, E., & Zucman, G. (2016). Wealth inequality in the United States since 1913: Evidence from capitalized income tax data. *The Quarterly Journal of Economics, 131*(2), 519–578. <https://doi.org/10.1093/qje/qjw004>
- Sahar, G. (2014). On the importance of attribution theory in political psychology. *Social and Personality Psychology Compass, 8*(5), 229–249. <https://doi.org/10.1111/spc3.12102>
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the life orientation test. *Journal of Personality and Social Psychology, 67*(6), 1063–1078. <https://doi.org/10.1037/0022-3514.67.6.1063>

- Schwabish, J. A., Smeeding, T. M., & Osberg, L. (2006). Income distribution and social expenditures. In D. Papadimitriou (Ed.), *The distributional effects of government spending and taxation* (pp. 247–288). Palgrave Macmillan.
https://doi.org/10.1057/9780230378605_9
- Shariff, A. F., Wiwad, D., & Aknin, L. B. (2016). Income mobility breeds tolerance for income inequality: Cross-national and experimental evidence. *Perspectives on Psychological Science, 11*(3), 373–380. <https://doi.org/10.1177/17456916166635596>
- Sides, J., Tesler, M., & Vavreck, L. (2017). The 2016 US election: How Trump lost and won. *Journal of Democracy, 28*(2), 34–44. <https://doi.org/10.1353/jod.2017.0022>
- Starmans, C., Sheskin, M., & Bloom, P. (2017). Why people prefer unequal societies. *Nature Human Behaviour, 1*(4), 0082. <https://doi.org/10.1038/s41562-017-0082>
- Tannenbaum, D., Fox, C. R., & Ülkümen, G. (2016). Judgment extremity and accuracy under epistemic vs. Aleatory uncertainty. *Management Science, 63*(2), 497–518.
<https://doi.org/10.1287/mnsc.2015.2344>
- Trump, K. S. (2018). Income inequality influences perceptions of legitimate income differences. *British Journal of Political Science, 48*(4), 929–952.
<https://doi.org/10.1017/s0007123416000326>
- Trump, K. S. (2020). When and why is economic inequality seen as fair. *Current Opinion in Behavioral Sciences, 34*, 46–51. <https://doi.org/10.1016/j.cobeha.2019.12.001>
- Trump, K. S., & White, A. (2018). Does inequality beget inequality? Experimental tests of the prediction that inequality increases system justification motivation. *Journal of Experimental Political Science, 5*(3), 206–216. <https://doi.org/10.1017/xps.2018.2>

- Tyler, T. (2011). Procedural justice shapes evaluations of income inequality: Commentary on Norton and Ariely (2011). *Perspectives on Psychological Science*, 6(1), 15–16.
<https://doi.org/10.1177/1745691610393981>
- Ülkümen, G., Fox, C. R., & Malle, B. F. (2016). Two dimensions of subjective uncertainty: Clues from natural language. *Journal of Experimental Psychology: General*, 145(10), 1280–1297. <https://doi.org/10.1037/xge0000202>
- Vavreck, L. (2014). Want a better forecast? Measure the campaign not just the economy. *PS: Political Science & Politics*, 47(2), 345–347.
<https://doi.org/10.1017/s1049096514000183>
- Voelkel, J. G., & Feinberg, M. (2018). Morally reframed arguments can affect support for political candidates. *Social Psychological and Personality Science*, 9(8), 917–924.
<https://doi.org/10.1177/1948550617729408>
- Voelkel, J. G., Mernyk, J. S., & Willer, R. (2020). Resolving the progressive paradox: The effects of moral reframing on support for economically progressive candidates. Retrieved from [10.31234/osf.io/mtfjn](https://doi.org/10.31234/osf.io/mtfjn)
- Walters, D. J., Ülkümen, G., Erner, C., Tannenbaum, D., & Fox, C. R. (2020). Investment behaviors under epistemic versus aleatory uncertainty.
- Weiner, B., Osborne, D., & Rudolph, U. (2011). An attributional analysis of reactions to poverty: The political ideology of the giver and the perceived morality of the receiver. *Personality and Social Psychology Review*, 15(2), 199–213.
<https://doi.org/10.1177/1088868310387615>

- Weisenthal, J. (2013). We Love What Warren Buffett Says About Life, Luck, And Winning The 'Ovarian Lottery'. Retrieved from <https://www.businessinsider.com/warren-buffett-on-the-ovarian-lottery-2013-12?international=true&r=US&IR=T>
- Wilson, M. S., & Sibley, C. G. (2013). Social dominance orientation and right-wing authoritarianism: Additive and interactive effects on political conservatism. *Political Psychology, 34*(2), 277–284. <https://doi.org/10.1111/j.1467-9221.2012.00929.x>
- Wolsko, C., Ariceaga, H., & Seiden, J. (2016). Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors. *Journal of Experimental Social Psychology, 65*, 7–19. <https://doi.org/10.1016/j.jesp.2016.02.005>
- WVS. (n.d.). World values survey wave 3 (1995–1998). <http://www.worldvaluessurvey.org/WVSDocumentationWV3.jsp>.
- Zucker, G. S., & Weiner, B. (1993). Conservatism and perceptions of poverty: An attributional analysis. *Journal of Applied Social Psychology, 23*(12), 925–943. <https://doi.org/10.1111/j.1559-1816.1993.tb01014.x>
- Zucman, G. (2019). Global wealth inequality. *Annual Review of Economics, 11*(1), 109–183. <https://doi.org/10.1146/annurev-economics-080218-025852>