

**Lay Theories of Financial Well-being**  
**Predict Political and Policy Message Preferences**

Job M. T. Krijnen,<sup>1</sup> Gülden Ülkümen,<sup>2</sup> Jonathan Bogard,<sup>1</sup> and Craig R. Fox<sup>1</sup>

<sup>1</sup> University of California, Los Angeles

<sup>2</sup> University of Southern California

**Author Note**

Job M. T. Krijnen is currently at the Dutch Authority for the Financial Markets (AFM).

This material is based upon work supported by the National Science Foundation under grant number SES-1427469 to Craig R. Fox and Gülden Ülkümen. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

We thank Shai Davidai, Thomas Gilovich, Jon Krosnick, and Jehan Sparks for helpful comments and suggestions on earlier drafts of this paper.

Correspondence concerning this article should be addressed to Job M. T. Krijnen. E-mail: [job.krijnen@afm.nl](mailto:job.krijnen@afm.nl)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22

### Abstract

People differ in their lay theories about how and why the financial well-being of individuals changes over time or varies between individuals. We introduce a measure of causal attributions of financial uncertainty—the CAFU Scale—and find that such attributions can be reliably described along three distinct 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”). In a sample representative of the U.S. population on various demographic characteristics ( $N = 1102$ ), we 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 various 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

23 **Lay Theories of Financial Well-being**  
24 **Predict Political and Policy Message Preferences**

25 Economic inequality is on the rise around the globe (Alvaredo et al., 2018; Piketty & Saez,  
26 2014; Saez & Zucman, 2016; Zucman, 2019). The issue has become a top priority in politics, and  
27 many politicians are seeking ways to garner broad support for proposals designed to address  
28 inequality. This is not an easy task. Although people show a surprising degree of consensus in  
29 their preference for a more equal society (Kiatpongsan & Norton, 2014; Norton & Ariely, 2011),  
30 they often disagree on when, why, and how the government should intervene through social  
31 welfare policies. Such disagreements may arise in part because people vary in their beliefs about  
32 what causes differences in financial well-being. For instance, surveys suggest that people's  
33 political and policy attitudes may be influenced by the extent to which they think that poverty or  
34 wealth is caused by structural, individualistic, or fatalistic factors (Bobbio et al., 2010; Bullock et  
35 al., 2003; Cozzarelli et al., 2001; Feagin, 1972; Feather, 1974; Furnham, 1982a, 1982b; Henry et  
36 al., 2004; Kluegel & Smith, 1986; Lepianka et al., 2009; Sahar, 2014; Weiner et al., 2011;  
37 Zucker & Weiner, 1993).

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

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

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

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

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

## 72 **Fair Allocations and Control**

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

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

91           While experimental games offer a crisp demonstration of the impact of control on  
92   distributional preferences, the precise mechanisms determining economic allocations outside the  
93   laboratory are typically unknown and therefore more open to interpretation. People may  
94   reasonably differ in the extent to which they believe allocations are driven by factors under the  
95   influence of the individual (i.e., discretionary variables) versus those that are not (i.e., exogenous  
96   variables; Konow, 1996, 2000). For instance, data from the World Values Survey gathered  
97   between 1983 and 1997 documents a sharp contrast between how people in Europe and people in  
98   the United States thought about poverty: 54% of Europeans believed that luck determines  
99   income, versus 30% of Americans; meanwhile, 26% of Europeans believed that the poor are  
100   lazy, versus 60% of Americans (Alesina & Glaeser, 2004; Alesina et al., 2001). Cross-national  
101   differences in beliefs about a larger role of luck and smaller role of effort in causing poverty  
102   predict stronger support for more progressive redistribution policies and higher welfare spending  
103   (Alesina & Angeletos, 2005; Alesina & Glaeser, 2004; Alesina & La Ferrara, 2005; Almås et al.,  
104   2020; Fong, 2001; Piff et al., 2020).

### 105   **Subjective Dimensions of Uncertainty**

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

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

117 A number of recent studies have documented the importance of the epistemic-aleatory  
118 distinction to a variety of behaviors. For instance, people acting as managers assign a greater  
119 proportion of compensation to performance-based incentives the more epistemic they see a task  
120 and they prefer longer evaluation windows the more aleatory they see a task (Fox, Tannenbaum  
121 et al., 2021). In other research, perceived nature of uncertainty has been found to predict the  
122 language that people use to communicate their uncertainty (Ülkümen et al., 2016), the extremity  
123 and accuracy of probability judgments (Tannenbaum et al., 2016), stock market investment  
124 behaviors (Walters et al., 2021) and willingness to bet under conditions of uncertainty or  
125 ambiguity (Fox, Goedde-Menke et al., 2021). This framework may be especially germane to the  
126 question of social welfare policy preferences because it distinguishes two qualitatively distinct  
127 ways in which changes in financial well-being can be out of one’s control: in inherently  
128 predictable ways and/or random ways.

### 129 **Synthesizing Literatures**

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

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

#### 144 **Three Distinct Dimensions of Beliefs about Changes in Financial Well-being**

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

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



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

163 Note that we use ‘Rewarding,’ ‘Rigged,’ and ‘Random’ as mnemonic shorthand labels for  
164 the extent to which changes in financial well-being are attributed to factors that are epistemic-  
165 discretionary, epistemic-exogenous, and aleatory-exogenous, respectively. While we believe that  
166 these labels capture the primary associations that people may have with the underlying  
167 constructs, we acknowledge that they do not fully capture them. For instance, epistemic-  
168 discretionary behaviors could be self-destructive (rather than rewarding) as when a lazy person  
169 predictably loses financial standing over time, and epistemic-exogenous behaviors could be  
170 designed to reduce economic inequality (rather than rig the system in favor of the wealthy) as  
171 with many government tax and welfare policies. This said, the scale that we will introduce for  
172 measuring these three dimensions is designed to more fully capture the underlying constructs  
173 than our shorthand labels might suggest.

174 **Table 1**

175 *Overview of the Rewarding, Rigged, and Random dimensions.*

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 - cultural or ethnic background/socio-economic 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

176

**177 Social Welfare Policy Preferences and Persuasive Messaging**

178 Governments have many different social welfare policy tools at their disposal. In practice,  
179 the same social welfare policy can be described in various ways, emphasizing different  
180 interpretations of the purpose of the policy. Consider a politician who proposes introducing a  
181 system for publicly-funded health care. Such a system can serve a redistributive purpose, by  
182 using the revenue from a progressive income tax to subsidize the cost of health care for the poor.  
183 At the same time, the system may function as social insurance, by pooling the risk of unforeseen  
184 health care costs among all people. Finally, there may be restrictions built into the system, with  
185 the intention of incentivizing desirable behavior and/or deter people from taking advantage of  
186 others—for instance if coverage is made conditional on work requirements.

187 Because social welfare policies are often a mixture of these (and possibly other) elements,  
188 politicians and policymakers who want to persuade the public have a choice to make: which  
189 element(s) to highlight when arguing in favor of a policy? We propose that policies and  
190 politicians will be viewed more favorably by an observer to the extent that a policy's description  
191 is more compatible with the observer's lay theory concerning how financial well-being changes  
192 over time. Past research has examined differences in beliefs about morality between liberals and  
193 conservatives as a starting point for crafting persuasive policy messages (Day et al., 2014;  
194 Feinberg & Willer, 2019). Messages that are compatible with beliefs about morality are more  
195 persuasive than messages that are incompatible with these beliefs (Feinberg & Willer, 2019;  
196 Kidwell et al., 2013; Lammers & Baldwin, 2018; Voelkel & Feinberg, 2018; Voelkel et al.,  
197 2020; Wolsko et al., 2016). We expect a similar association between beliefs about uncertainty in  
198 financial well-being and responses to different kinds of messages about social welfare policies,  
199 even when controlling for political ideology.

200 In particular, we hypothesize that people who score higher on the Rewarding dimension  
201 will be more supportive of a social welfare policy when its tendency to motivate effort or  
202 resourcefulness is emphasized. Such an *Incentivizing* message stresses the need for welfare  
203 support to be made conditional on individual inputs in order to restrict assistance to the deserving  
204 and/or to motivate desirable behavior. Second, we hypothesize that people who score higher on  
205 the Rigged dimension will be more supportive of a social welfare policy when its goal of helping  
206 traditionally disadvantaged groups is emphasized. Such a *Redistribution* message focuses on  
207 repairing imbalance in society and may therefore be particularly attractive to people who believe  
208 that changes in financial well-being can be attributed to knowable factors that are beyond the  
209 control of the individual. Finally, we hypothesize that people who score higher on the Random  
210 dimension will be more supportive of a social welfare policy when it is characterized as a form  
211 of social insurance. Such a *Risk-pooling* message emphasizes how a policy is intended to  
212 collectively insure everyone against the risk of unforeseeable negative outcomes.

### 213 **Overview of Studies**

214 In this article we introduce a measure of the Rewarding, Rigged, and Random  
215 dimensions of lay theories concerning changes in financial well-being. We establish the  
216 concurrent validity of this measure, by examining how the dimensions are associated with  
217 political ideology when taking into account the association with demographic variables and other  
218 related psychological constructs (Study 1). Next, we leverage these insights to test our  
219 predictions that policy messages highlighting Incentivizing, Redistribution, and Risk-pooling are  
220 more persuasive to individuals with lay theories that are high on Rewarding, Rigged, and  
221 Random dimensions, respectively. In particular, we examine how beliefs about changes in  
222 financial well-being are associated with rated importance of different goals that a government

223 may pursue (Study 2), the relative persuasiveness of messages that highlight these different goals  
224 for various social welfare policies (Study 3) and support for political candidates who speak about  
225 these different goals (Study 4)—all while controlling for differences in political ideology. For all  
226 of these studies we preregistered hypotheses, materials, sample size, inclusion criteria, and key  
227 analyses prior to data collection (see preregistrations for [Study 1](#), [Study 2](#), [Study 3](#), and [Study 4](#)).

228

### Study 1

229 In our first study we introduce and validate a scale measuring beliefs about changes in  
230 financial well-being. We developed this scale in a deductive, top-down manner, rather than  
231 through inductive, bottom-up scale-development procedures (Boateng et al., 2018; Hinkin,  
232 1995). Thus, rather than derive our scale and its factor structure from an initial pool of items, we  
233 theoretically deduced the dimensional structure and scale items from the synthesis of two  
234 research streams that we described in the Introduction. This synthesis yielded the three  
235 dimensions that we believe capture the relevant range of lay theories of financial well-being. The  
236 conclusion that our scale successfully captures the large majority of lay theories that  
237 spontaneously occur to people is bolstered by results of a follow-up test, reported in the  
238 Supplemental Material (Study S1A) and described further in the General Discussion.

239 We first examine the factor structure of our scale and test for measurement invariance. To  
240 further validate our scale, we examine the extent to which the Rewarding, Rigged, and Random  
241 subscales are associated with political ideology, a variable that is widely used in earlier  
242 psychological research and that can serve as an initial indication for whether beliefs about the  
243 uncertainty in financial well-being are relevant for sensitivity to policy messaging. Liberals on  
244 the political left and conservatives on the right have often been described to differ in their  
245 openness to change, their preference for stability, and their acceptance of inequality (Hirsh et al.,

246 2010; Jost, 2017; Jost et al., 2009; McCrae, 1996). According to Jost et al. (2003), conservative  
247 ideology is characterized in part by a need to “avoid change, disruption, and ambiguity (...) and  
248 to explain, order, and justify inequality among groups and individuals.” Conservatives and  
249 liberals also differ in their lay beliefs about free will; conservatives tend to believe that people  
250 have more autonomous control over their behavior (Carey & Paulhus, 2013; Everett et al., 2020).  
251 These differences may be a reason why conservatives tend to favor internal causal attributions  
252 for outcomes in life. Conservatives are for instance more likely than liberals to believe that  
253 poverty is caused by a lack of effort (Zucker & Weiner, 1993) and to blame the poor for their  
254 own plight (Weiner et al., 2011).

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

264       Mapping lay theories of financial well-being along three conceptually distinct dimensions  
265 also allows us to examine the relative strength of each dimension’s association with political  
266 ideology. This leads to a more nuanced understanding of what distinguishes liberal ideology  
267 from conservative ideology. Instead of placing liberals and conservatives on opposite ends of a

268 luck versus effort continuum, we will be able to examine precisely to what extent each of the  
269 three dimensions is uniquely associated with the ideological divide.

270 To further explore the extent to which the Rewarding, Rigged, and Random dimensions  
271 constitute a promising framework for crafting effective political and policy messages, we  
272 compare each dimension's ability to predict political ideology with several psychological  
273 constructs that have previously been found to correlate with political ideology. In particular, two  
274 of these constructs can serve as relevant benchmarks. First, we examine social dominance  
275 orientation (SDO; Pratto et al., 1994) and right-wing authoritarianism (RWA; Altemeyer, 1988).  
276 Together, a preference for social hierarchy (as captured by SDO) and a commitment to authority  
277 and tradition (as captured by RWA) seem to lie at the core of what it means to hold conservative  
278 beliefs (Duckitt & Sibley, 2010; Jost et al., 2003; Wilson & Sibley, 2013). We thus expect to find  
279 that both these constructs are positively associated with self-reported conservative ideology.

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

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

## 293 **Method**

### 294 *Participants*

295 We recruited participants through Lucid’s Fulcrum Academia service ( $N = 1102$ ; 52%  
296 female,  $M_{\text{age}} = 44.01$ ,  $SD_{\text{age}} = 16.63$ ). We aimed to recruit 1000 participants and ended up with  
297 partial or complete data for 1168 participants.<sup>1</sup> The sample was demographically targeted using  
298 quotas to be representative of the U.S. population in terms of age, gender, region, household  
299 income, education, and ethnicity. Of course, given the non-probability nature of quota sampling,  
300 the sample may not fully reflect the U.S. population. We removed data of 66 participants before  
301 analyses because they did not complete one of the key variables. The collected data was  
302 supplemented with socio-demographic information that participants had provided to the panel  
303 service at an earlier time (level of education, ethnicity, gender, household income, political party  
304 preference, and U.S. region of residence).

### 305 *Procedure & Materials*

306 We developed a nine-item Causal Attributions of Financial Uncertainty Scale (CAFU). We  
307 adapted scale items from the Epistemic-Aleatory Rating Scale (EARS; Fox, Tannenbaum et al.,  
308 2021). In the first part of the survey, participants rated their level of agreement (1 = “not at all”;  
309 7 = “very much”) with nine statements that assessed the perceived nature of uncertainty in a  
310 “person’s change in financial well-being from one year to the next.” The nine items were

---

<sup>1</sup> We conducted a post-hoc sensitivity analysis for a single coefficient in a multiple regression analysis with 3 predictors. The minimum detectable effect with  $N = 1000$ ,  $\alpha = .05$ , and 95% power is  $f^2 = .017$ . This effect size is below Cohen’s (1988) threshold for a small effect size ( $f^2 = .02$ ). We present similar sensitivity analyses for Studies 2-4 in the Supplemental Material.



311 presented in random order on a single page. Three items were designed to assess the extent to  
312 which participants perceived changes in financial well-being as knowable based on inputs such  
313 as effort and skill, and were averaged into a single *Rewarding* score. Three items were designed  
314 to assess the extent to which participants perceived changes in financial well-being as knowable  
315 based on systemic factors such as discrimination and favoritism, and were averaged into a single  
316 *Rigged* score. Three items were designed to assess the extent to which participants perceived  
317 changes in financial well-being as being due to chance events and were averaged into a single  
318 *Random* score.<sup>2</sup> See Table 2 for all items of the CAFU Scale and Table 3 for scale descriptive  
319 statistics, measures of internal consistency, and correlation coefficients.

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

322 The third part of the survey consisted of a series of scales measuring constructs potentially  
323 associated with political ideology and beliefs about financial well-being. In random order,  
324 participants were presented with the following measures: Social Dominance Orientation (SDO;  
325 Ho et al., 2015), Right-Wing Authoritarianism (RWA; Bizumic & Duckitt, 2018), Moral  
326 Foundations Questionnaire (MFQ; Graham et al., 2011), Belief in a Just World (BJW; Dalbert,  
327 1999), General System Justification (GSJ; Kay & Jost, 2003), Protestant Work Ethic (PWE; Ho  
328 et al., 2012), trait optimism (Scheier et al., 1994), meritocratic beliefs (Day & Fiske, 2017),  
329 perceived societal social mobility (Day & Fiske, 2017), perceived individual social mobility  
330 (Day & Fiske, 2017), two questions assessing attributions of wealth and poverty (adapted from  
331 Gallup, 1998; PEW, 2018), one question from the World Values Survey about why there are

---

<sup>2</sup> Because the labels ‘Rewarding,’ ‘Rigged’ and ‘Random’ may have particularly positive or negative connotations to participants, we never use these labels in the instructions or scale items.

332 people living in need (WVS, n.d.), and two questions about the perceived fairness of the  
333 American economic system (adapted from WVS, n.d.; PEW, 2018).

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

339 The Institutional Review Board of University of California Los Angeles granted ethical  
340 approval for all studies described in this article (Protocol ID: 14-000698, Project title:  
341 Distinguishing Two Dimensions of Subjective Uncertainty).

342 **Table 2**343 *Items of the Causal Attributions of Financial Uncertainty Scale (CAFU).*


---

Subscale	CAFU 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.

---

344

345 **Table 3**346 *Studies 1-4 CAFU Scale Descriptive Statistics, Measures of Internal Consistency, and*347 *Correlation Coefficients.*

Study 1								
Subscale	<i>M</i>	<i>SD</i>	$\alpha$	$\omega_t$	$\omega_h$	<i>r</i> ( , Rew.)	<i>r</i> ( , Rig.)	<i>r</i> ( , Ran.)
Rewarding	4.92	1.20	0.65	0.66	0.66		.25	.26
Rigged	4.25	1.43	0.73	0.73	0.74	.25		.52
Random	4.18	1.33	0.70	0.70	0.70	.26	.52	
Study 2								
Subscale	<i>M</i>	<i>SD</i>	$\alpha$	$\omega_t$	$\omega_h$	<i>r</i> ( , Rew.)	<i>r</i> ( , Rig.)	<i>r</i> ( , Ran.)
Rewarding	4.91	1.07	0.68	0.69	0.68		-.11	-.19
Rigged	4.32	1.29	0.75	0.75	0.75	-.11		.35
Random	4.06	1.27	0.78	0.78	0.78	-.19	.35	
Study 3								
Subscale	<i>M</i>	<i>SD</i>	$\alpha$	$\omega_t$	$\omega_h$	<i>r</i> ( , Rew.)	<i>r</i> ( , Rig.)	<i>r</i> ( , Ran.)
Rewarding	4.66	1.16	0.73	0.73	0.73		-.09	-.10
Rigged	4.34	1.34	0.75	0.75	0.75	-.09		.42
Random	4.11	1.26	0.78	0.78	0.79	-.10	.42	
Study 4								
Subscale	<i>M</i>	<i>SD</i>	$\alpha$	$\omega_t$	$\omega_h$	<i>r</i> ( , Rew.)	<i>r</i> ( , Rig.)	<i>r</i> ( , Ran.)
Rewarding	4.72	1.12	0.71	0.71	0.71		-.07	-.04
Rigged	4.37	1.33	0.76	0.76	0.76	-.07		.47
Random	4.16	1.24	0.75	0.75	0.75	-.04	.47	

348 *Note.*  $\alpha$  = Cronbach's alpha;  $\omega_t$  = McDonald's omega total;  $\omega_h$  = McDonald's omega349 hierarchical; *r* = Pearson's correlation coefficient.

## 350 **Results**

351 In this section we examine psychometric properties and validity of the CAFU Scale (cf.  
352 Flake et al., 2017): in particular, we test its factor structure, demonstrate measurement  
353 invariance, and test its concurrent validity against related constructs.

### 354 *Examining the Factor Structure of the CAFU Scale*

355 To examine structural validity, we used confirmatory factor analysis to evaluate the fit of  
356 the proposed model. Using the cutoff values suggested by Hu and Bentler (1999), all indices  
357 indicate a good between the proposed model and the observed data: comparative fit index (CFI)  
358 = .97 (> .95), Tucker-Lewis index (TLI) = .96 (> .95), root mean square error of approximation  
359 (RMSEA) = .05 (< .06), and standardized root mean square residual (SRMR) = .04 (< .08). In  
360 addition, the proposed model passes Hu and Bentler's (1999) suggested combination rule of  
361  $RMSEA < .06$  and  $SRMR < .09$ .<sup>3</sup> Figure 1 displays a graphical representation of the proposed  
362 model, including the standardized factor loadings and covariances between latent variables.

### 363 *Testing Measurement Invariance*

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

---

<sup>3</sup> We present a similar analysis with data from Studies 2-4 in the Supplemental Material.

371 assesses equivalence of factor loadings across groups; and (3) scalar invariance, which tests for  
 372 equivalence of item intercepts across groups.

373 Table 4 shows the fit indices used to test for configural invariance and Table 5 shows the  
 374 differences in fit indices used to test for metric and scalar invariance. All tests of measurement  
 375 invariance pass conventional testing criteria, indicating that the CAFU Scale measures the same  
 376 constructs (Rewarding, Rigged, and Random) in male and female participants, younger and older  
 377 participants, and liberal and conservative participants.

378

379 **Table 4**

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

Measurement invariance test	$\chi^2$	<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

381 *Note.* CFI = comparative fit index; TLI = Tucker-Lewis fit index; RMSEA = root mean square  
 382 error of approximation; SRMR = standardized root mean square residual. Test is passed when  
 383  $SRMR \leq 0.09$  and at least one of the following conditions is met:  $CFI \geq 0.95$ ,  $TLI \geq 0.95$ ,  
 384  $RMSEA \leq 0.06$ . Criteria based on Hussey and Hughes (2020), Hu and Bentler (1999), Chen  
 385 (2007), and Putnick and Bornstein (2016).

386 **Table 5**387 *Study 1 Differences in Fit Indices for Tests of Metric and Scalar Invariance on Gender, Age, and*388 *Political Ideology.*

Measurement invariance test	<i>df</i>	$\Delta$ CFI	$\Delta$ TLI	$\Delta$ 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

389 *Note.* CFI = comparative fit index; TLI = Tucker-Lewis fit index; RMSEA = root mean square

390 error of approximation; SRMR = standardized root mean square residual. Tests are passed when

391  $\Delta$ CFI  $\geq$  -0.015 and  $\Delta$ RMSEA  $\leq$  0.01. Criteria based on Hussey and Hughes (2020), Hu and

392 Bentler (1999), Chen (2007), and Putnick and Bornstein (2016).

393

394 ***Rewarding, Rigged, and Random as Predictors of Political Ideology***

395 Figure 2 displays the association between political ideology and scores on the three CAFU

396 subscales. Confirming our expectations, participants who rated themselves as more politically

397 conservative tended to score higher on the Rewarding dimension ( $r = 0.13, p < .001$ ), lower on398 the Rigged dimension ( $r = -0.20, p < .001$ ), and lower on the Random dimension ( $r = -0.09, p =$ 399  $.005$ ).

400 To examine concurrent validity, we specified a series of structural equation path models

401 testing each dimension (Rewarding, Rigged, and Random) as a latent variable predictor of

402 political ideology, while controlling for the set of socio-demographic variables.<sup>4</sup> We do this first

<sup>4</sup> 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).

403 for individual subscales, as displayed in Figure 3, then simultaneously for all subscales, as  
404 displayed in Figure 4.

405 The independent tests of each subscale (Figure 3) shows that when controlling for socio-  
406 demographic variables, Rewarding has a significant positive association with political ideology  
407 (conservatism), Rigged has a significant negative association with political ideology, and  
408 Random has a significant negative association with political ideology. The simultaneous test of  
409 all subscales (Figure 4) shows that the Rigged and the Rewarding dimensions are both  
410 significantly associated with political ideology, even when controlling for the other dimensions  
411 of beliefs about financial well-being and socio-demographic variables. The prediction of political  
412 ideology by the Random subscale in this case is no longer significant. A fuller account of these  
413 models is described in the Supplemental Material.

414

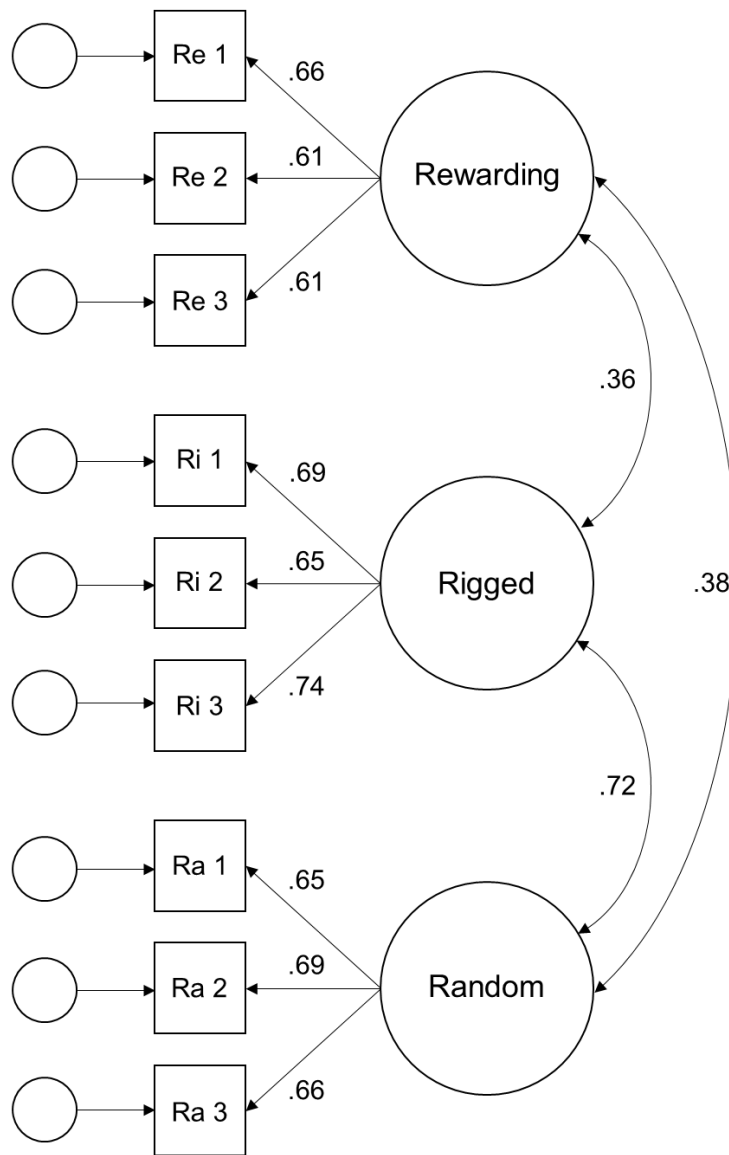
415



416 **Figure 1**

417 *Study 1 Confirmatory Factor Analysis of the Proposed Model with Rewarding, Rigged, and*

418 *Random as Latent Variables.*



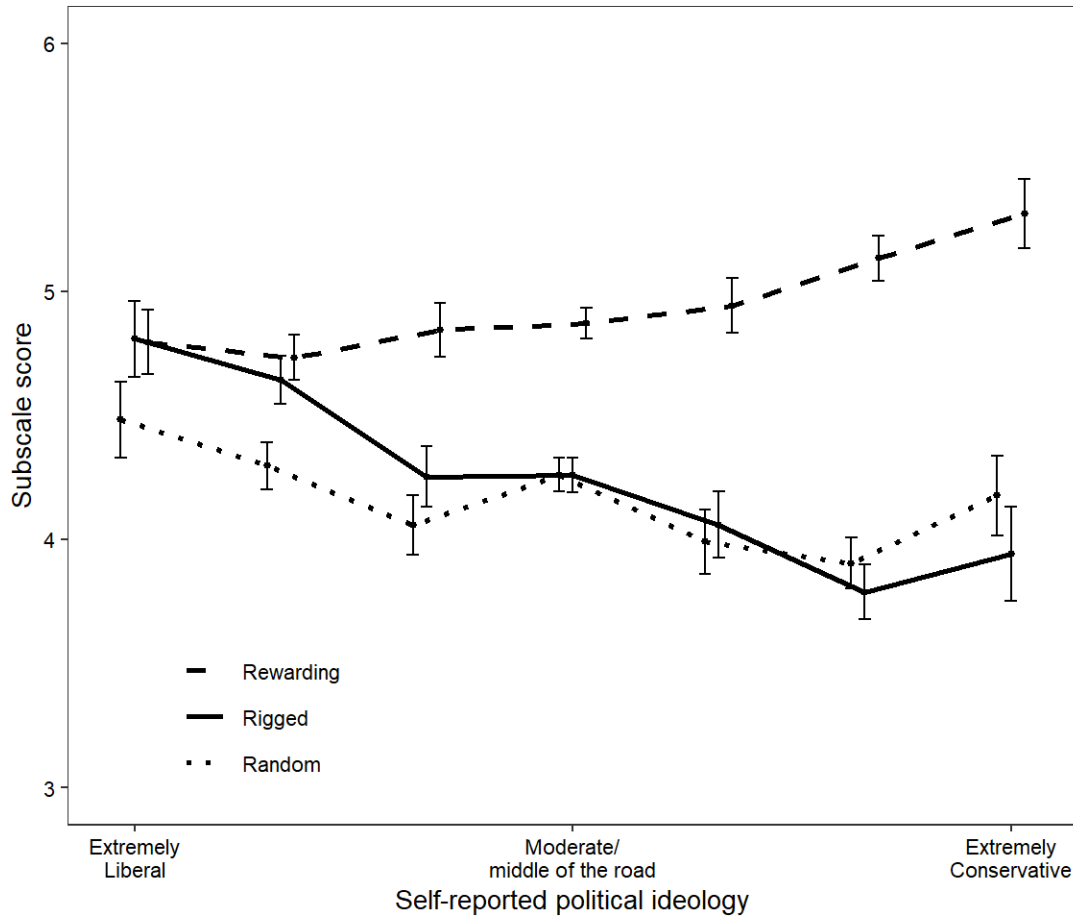
419

420 *Note.* Numbers on the left indicate standardized factor loadings. Numbers on the right (curved

421 arrows) indicate standardized latent variable covariances.

422 **Figure 2**

423 *Study 1 Scores on CAFU Subscales as a Function of Self-reported Political Ideology.*



424

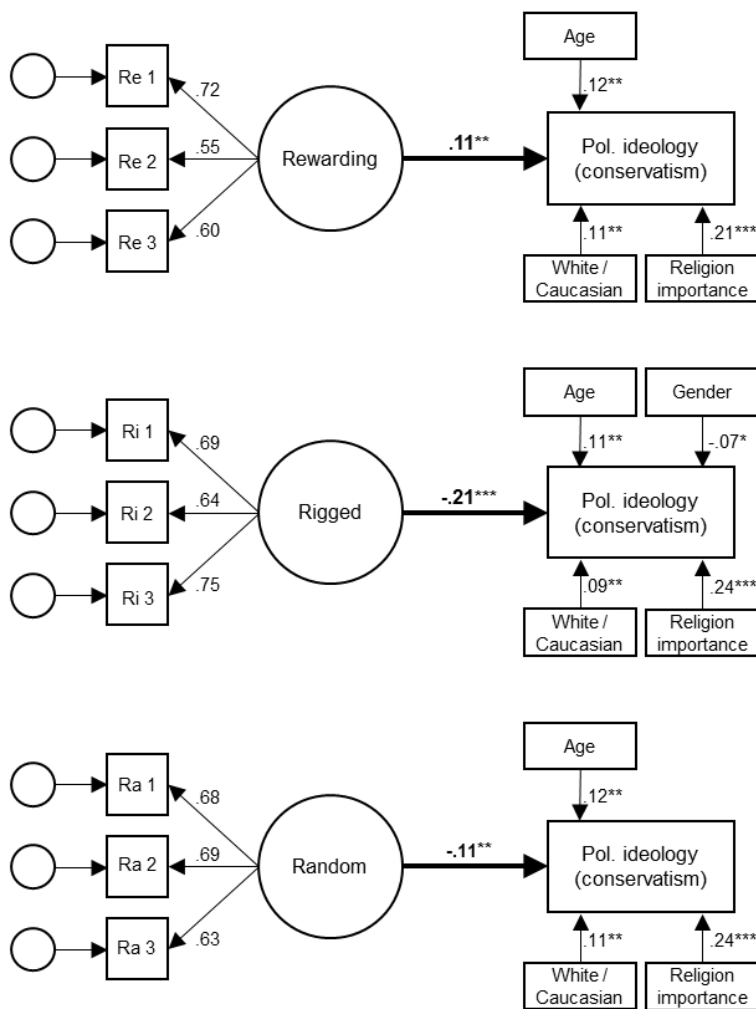
425 *Note.* Bars indicate standard errors.

426

427 **Figure 3**

428 *Study 1 Independent Prediction of Political Ideology by the Rewarding, Rigged, and Random*

429 *Subscales of CAFU, Controlling for Socio-demographic Variables in Path Models*



430

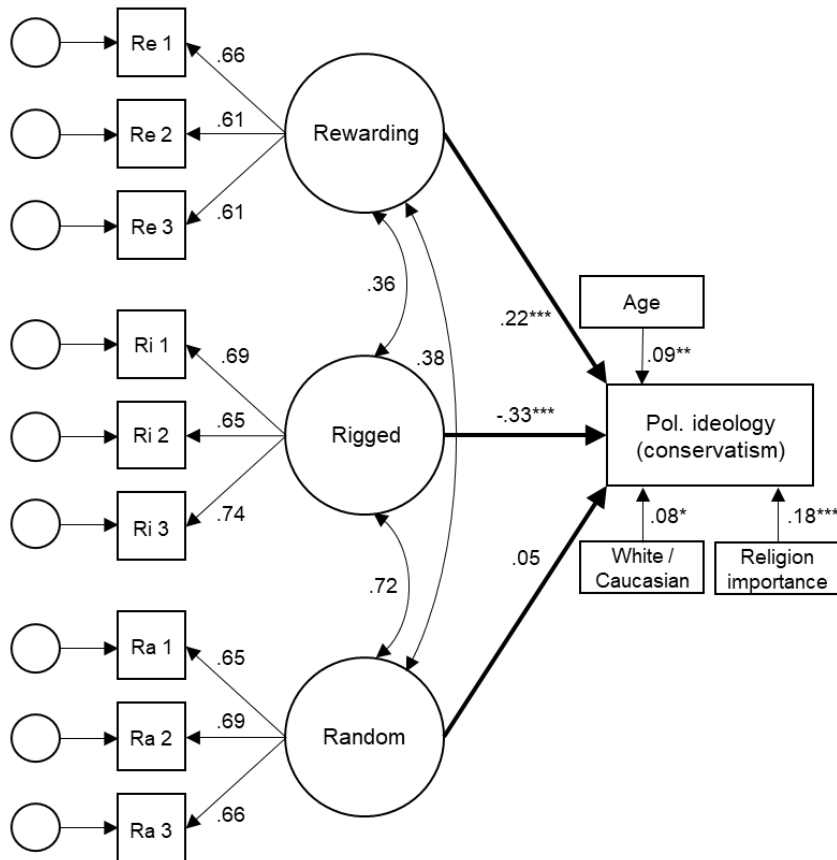
431 *Note.* Numbers on the left indicate standardized factor loadings. Numbers on the right indicate  
 432 standardized regression coefficients for all significant predictors (\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p <$   
 433  $.001$ ). Predictors that were included in the models but were not significant: only child, subjective  
 434 SES, household income, Hispanic/Latino, religion, college degree, married, employed, children,  
 435 first born, U.S. born.

436

437 **Figure 4**

438 *Study 1 Simultaneous Prediction of Political Ideology by the Rewarding, Rigged, and Random*

439 *Subscales of CAFU, Controlling for Socio-demographic Variables in a Path Model*



440

441 *Note.* Numbers on the left indicate standardized factor loadings. Numbers in the middle (curved

442 arrows) indicate standardized latent variable covariances. Numbers on the right indicate

443 standardized regression coefficients for all significant predictors (\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p <$

444  $.001$ ). Predictors that were included in the models but were not significant: gender, only child,

445 subjective SES, household income, Hispanic/Latino, religion, college degree, married, employed,

446 children, first born, U.S. born.

447

448 *Predicting Political Ideology when Controlling for Related Constructs*

449 We next test the concurrent validity of CAFU subscales against other individual difference  
450 measures that have been related to political ideology in prior literature. Simple correlational  
451 analyses largely replicate prior results. In particular, participants with a higher SDO score,  
452 indicating a preference for hierarchical social structure, rated themselves as more politically  
453 conservative ( $r = 0.26, p < .001$ ). Participants with a higher RWA score, indicating a  
454 commitment to authority and tradition, also rated themselves as more politically conservative ( $r$   
455  $= 0.39, p < .001$ ). As for Moral Foundations, participants who rated themselves as more  
456 conservative put less weight on the fairness dimension ( $r = -0.08, p = .014$ ), and more weight on  
457 the dimensions of ingroup loyalty ( $r = 0.12, p < .001$ ), obedience to authority ( $r = 0.10, p =$   
458  $.001$ ), and purity ( $r = 0.17, p < .001$ ). Interestingly, political ideology was not significantly  
459 correlated with the rated importance of the harm dimension ( $r = -0.03, p = .281$ ).

460 We performed three sets of linear regression analyses. The first set examined whether the  
461 Rewarding, Rigged, and Random subscales are each still significant predictors of political  
462 ideology when controlling for SDO and RWA (see Table 6). All three subscales of the CAFU  
463 remain significant predictors of political ideology when controlling for these scales. Likewise, a  
464 second set of three regression analyses examined whether the Rewarding, Rigged, and Random  
465 subscales are each still significant predictors of political ideology when controlling for the five  
466 moral foundations of care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and  
467 purity/degradation (see Table 7). Again, all three subscales of the CAFU remain significant when  
468 controlling for the five moral foundation subscales.

469 In a final regression analysis, we included all 19 individual difference measures and 15  
470 socio-demographic variables simultaneously into a single linear regression and examined

471 whether the Rewarding, Rigged, and Random subscales of the CAFU remain significant  
472 predictors of political ideology (see Table 8). The positive prediction of political ideology  
473 (conservatism) by the Rewarding dimension and the negative prediction of political ideology the  
474 Rigged dimension remain significant in this full model. Other significant predictors of political  
475 ideology are age, ethnicity (white/Caucasian), SDO, RWA, meritocratic beliefs, and causal  
476 attribution of poverty. The Random dimension is no longer a significant predictor of political  
477 ideology. Figure 5 shows the absolute standardized regression coefficients of the included  
478 variables.  
479

480 **Table 6**

481 *Study 1 Prediction of Political Ideology (Higher is more Conservative) by CAFU Subscales, Controlling for Social Dominance*  
 482 *Orientation (SDO) and Right-Wing Authoritarianism (RWA) in Linear Regressions.*

Effect	Model 1			Model 2			Model 3	
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$
Rewarding	0.12 [0.04, 0.20]	0.08	.003					
Rigged				-0.19[-0.25, -0.12]	-0.16	<.001		
Random							-0.12[-0.19, -0.05]	-0.09
SDO	0.34 [0.24, 0.43]	0.20	<.001	0.48 [0.23, 0.41]	0.19	<.001	0.34 [0.25, 0.43]	0.20
RWA	0.53 [0.44, 0.62]	0.34	<.001	0.52 [0.44, 0.61]	0.34	<.001	0.55 [0.46, 0.63]	0.35
Intercept	0.14 [-0.41, 0.70]		.610	1.63 [1.09, 2.16]		<.001	1.17 [0.65, 1.69]	
Observations	1035			1035			1035	
$R^2$	.20			.22			.20	
Adjusted $R^2$	.20			.22			.20	

501 **Table 7**

502 *Study 1 Prediction of Political Ideology (Higher is More Conservative) by CAFU Subscales, Controlling for the Five Subscales of the*

503 *Moral Foundations Questionnaire (MFQ) in Linear Regressions.*

Effect	Model 1			Model 2			Model 3		504
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	505 506
Rewarding	0.14 [0.05, 0.23]	0.10	.002						507
Rigged				-0.24[-0.31, -0.17]	-0.20	<.001			
Random							-0.16[-0.24, -0.09]	-0.13	508 <.001
MFQ: care/harm	-0.16[-0.31, -0.02]	-0.11	.031	-0.13[-0.28, 0.01]	-0.08	.078	-0.16[-0.31, -0.01]	-0.10	509 .036
MFQ: fairness/cheat.	-0.33[-0.48, -0.19]	-0.22	<.001	-0.27[-0.41, -0.13]	-0.17	<.001	-0.32[-0.46, -0.18]	-0.21	510 <.001
MFQ: loyalty/betray.	0.13 [-0.01, 0.27]	0.09	.065	0.15 [0.02, 0.29]	0.10	.028	0.14 [0.01, 0.28]	0.09	511 .040
MFQ: authority/subv.	0.08 [-0.07, 0.23]	0.05	.312	0.09 [-0.06, 0.24]	0.05	.255	0.13 [-0.02, 0.28]	0.08	512 .092
MFQ: purity/degrad.	0.33 [0.21, 0.46]	0.23	<.001	0.33 [0.21, 0.46]	0.23	<.001	0.35 [0.22, 0.47]	0.24	513 <.001
Intercept	3.34 [2.80, 3.88]		<.001	4.53 [4.04, 5.02]		<.001	4.32 [3.81, 4.82]		514 <.001
Observations	1040			1040			1040		
$R^2$	.09			.12			.10		
Adjusted $R^2$	.08			.11			.09		



514 **Table 8**

515 *Study 1 Prediction of Political Ideology (Higher is more Conservative) by CAFU Subscales,*  
 516 *Controlling for Socio-demographic Variables and Individual Differences Measures (Model 2) in*  
 517 *a Linear Regression.*

Effect	Model 1			Model 2		
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>
Rewarding	0.27 [0.19, 0.36]	0.19	<.001	0.16 [0.06, 0.26]	0.11	.001
Rigged	-0.29[-0.37, -0.21]	-0.24	<.001	-0.19[-0.27, -0.10]	-0.16	<.001
Random	-0.01[-0.10, 0.07]	-0.01	.770	-0.02[-0.11, 0.06]	-0.02	.587
Age				0.01 [0.01, 0.02]	0.12	.001
Female				-0.01 [-0.22, 0.20]	-0.00	.899
Household income				0.00 [-0.02, 0.01]	-0.01	.754
White/Caucasian				0.32 [0.07, 0.58]	0.08	.012
Hispanic				0.10 [-0.22, 0.42]	0.02	.543
Religious				-0.08[-0.29, 0.14]	-0.02	.480
College degree				-0.01[-0.21, 0.20]	-0.00	.951
Married				0.05 [-0.16, 0.26]	0.01	.645
Employed				-0.05[-0.26, 0.17]	-0.01	.674
Children				0.03 [-0.19, 0.25]	0.01	.765
First born				0.02 [-0.20, 0.24]	0.00	.883
Only child				0.22 [-0.10, 0.54]	0.04	.171
Religion importance				0.05 [-0.01, 0.10]	0.06	.082
U.S. born				-0.01[-0.44, 0.41]	-0.00	.953
MSSSS				-0.02[-0.06, 0.02]	-0.03	.308
SDO				0.29 [0.17, 0.41]	0.17	<.001
RWA				0.38 [0.27, 0.49]	0.25	<.001
GSJ				-0.07[-0.21, 0.07]	-0.04	.308
BJW				-0.08[-0.20, 0.04]	-0.06	.168
PWE				-0.08[-0.20, 0.05]	-0.05	.220
Optimism				-0.01[-0.11, 0.08]	-0.01	.777
Meritocratic beliefs				0.18 [0.03, 0.32]	0.11	.017

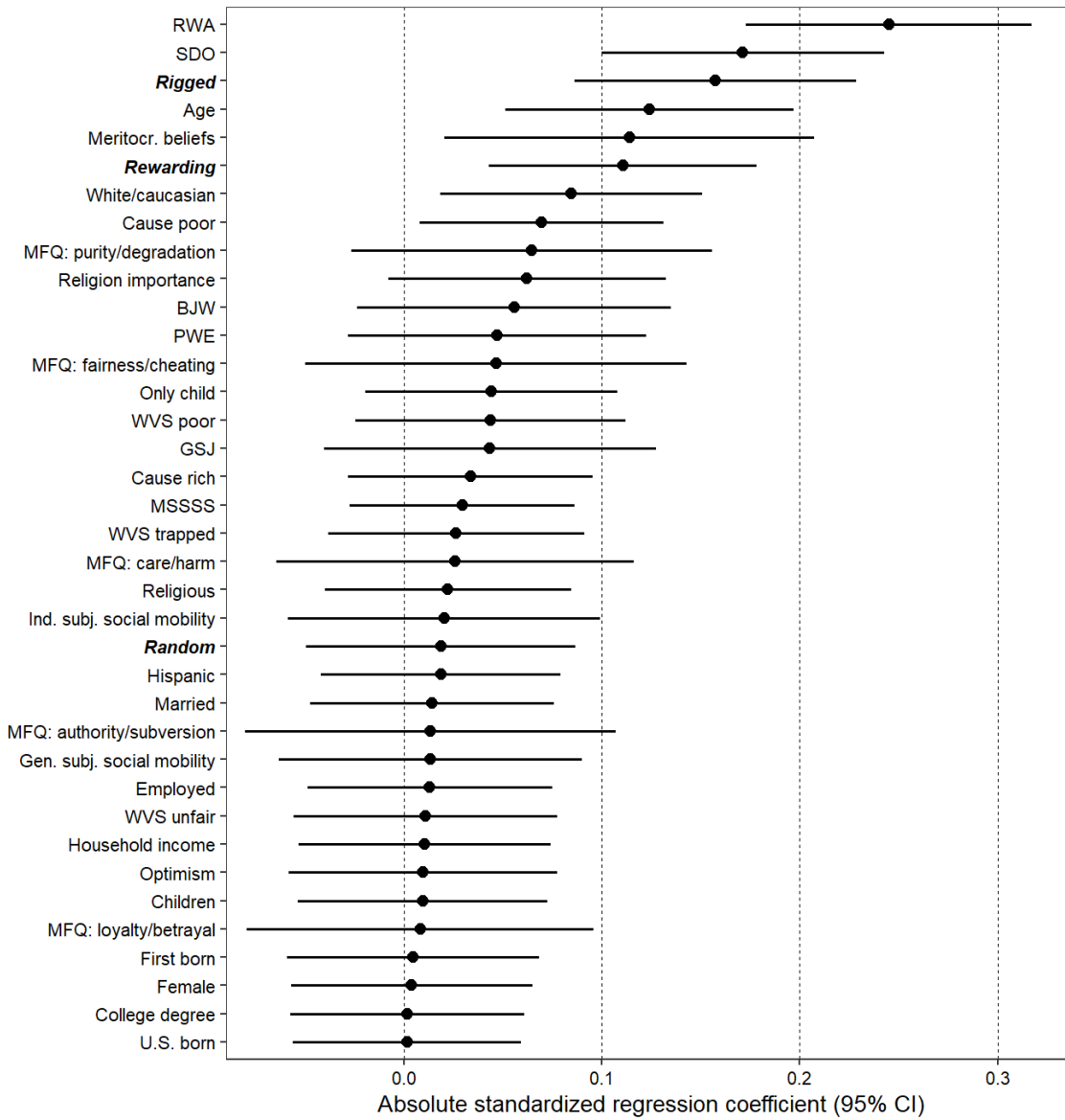
Societal social mobility			0.02 [-0.11, 0.15]	0.01	.733
Individual social mobility			0.03 [-0.09, 0.15]	0.02	.612
MFQ: care/harm			-0.04[-0.19, 0.10]	-0.03	.573
MFQ: fairness/cheating			-0.07[-0.23, 0.08]	-0.05	.344
MFQ: loyalty/betrayal			0.01 [-0.12, 0.15]	0.01	.851
MFQ: authority/subversion			-0.02[-0.17, 0.13]	-0.01	.777
MFQ: purity/degradation			0.09 [-0.04, 0.23]	0.06	.165
Cause poor			-0.19[-0.36, -0.02]	-0.07	.026
Cause rich			0.09 [-0.07, 0.25]	0.03	.284
WVS poor			-0.15[-0.39, 0.08]	-0.04	.207
WVS trapped			0.09 [-0.13, 0.32]	0.03	.420
WVS unfair			-0.04[-0.27, 0.20]	-0.01	.747
Intercept	3.92 [3.45, 4.40]	<.001	1.30 [-0.14, 2.75]		.078
Observations	1096		958		
$R^2$	.07		.29		
Adjusted $R^2$	.07		.26		

518 *Note.* MSSS = MacArthur Scale of Subjective Social Status; SDO = Social Dominance  
519 Orientation; RWA = Right-Wing Authoritarianism; GSJ = General System Justification; BJW =  
520 Belief in a Just World; PWE = Protestant Work Ethic; MFQ = Moral Foundations Questionnaire;  
521 WVS = World Values Survey.

522 **Figure 5**

523 *Study 1 Prediction of Political Ideology by Individual-Difference Measures and*

524 *Sociodemographic Variables in a Linear Regression.*



525

526 *Note.* RWA = Right-Wing Authoritarianism; SDO = Social Dominance Orientation; MFQ =

527 Moral Foundations Questionnaire; BJW = Belief in a Just World; PWE = Protestant Work Ethic;

528 WVS = World Values Survey; GSJ = General System Justification; MSSSS = MacArthur Scale of

529 Subjective Social Status.

**530 Discussion**

531       The results from Study 1 confirm that people’s beliefs about changes in financial well-  
532 being can best be described along three conceptually distinct dimensions: Rewarding, Rigged,  
533 and Random. We designed the CAFU Scale to measure lay theories in this context. To  
534 understand how people think about changes in financial well-being, we need more than a single  
535 dimension of perceived individual control, more than two distinct dimensions of beliefs about the  
536 role of discretionary and exogenous factors determining financial outcomes, and more than a  
537 distinction between knowable and random uncertainty. By combining insights from different  
538 lines of past research, we come to a more nuanced mapping of lay theories, one that recognizes  
539 that some exogenous factors determining financial well-being are perceived as knowable  
540 whereas other exogenous factors are perceived as random.

541       In a sample of participants that was targeted using quotas to be demographically  
542 representative of the U.S. population, we find that the Rewarding, Rigged, and Random  
543 dimensions are all associated with political ideology, even when controlling for socio-  
544 demographic variables and other psychological constructs such as Social Dominance  
545 Orientation, Right-Wing Authoritarianism, and moral foundations. Reassuringly, the conclusion  
546 that liberals tend to see changes in financial well-being as more rigged whereas conservatives  
547 tend to see changes in financial well-being as more rewarding accords with the causes, reasons,  
548 and factors that were spontaneously listed by participants in Study S1A, as reported in the  
549 Supplemental Materials.

550       Past research has focused on beliefs about the degree of individual control as a predictor of  
551 political ideology. Using the model proposed here, with three conceptually and structurally  
552 distinct dimensions, we can go a step further and examine the relative importance of the

553 knowable and random elements of those beliefs. We find that the two knowable dimensions  
554 (Rewarding and Rigged) have greater standardized associations with political ideology than the  
555 Random dimension does. This suggests that we should not simply equate beliefs about a lack of  
556 individual control with beliefs about the role of luck in determining financial outcomes. People  
557 intuitively distinguish between the knowable and the random, and this distinction matters when  
558 trying to explain political preferences.

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

568         In this study and the studies that follow, we focus on capturing lay theories concerning  
569 *future changes* in financial well-being, rather than lay theories concerning what determines  
570 *current states* of financial well-being (i.e., causes of current wealth inequality). We expected that  
571 beliefs about changes in financial well-being would be more relevant to people’s policy  
572 preferences and we designed the statements of the CAFU Scale to reflect this focus: participants  
573 are asked about “a person’s change in financial well-being from one year to the next.” Of course,  
574 it is possible that people’s lay theories about the determinants of current states of financial well-  
575 being are different from their lay theories about future changes in financial well-being. Likewise,

576 it is possible that the strength of associations between different dimensions is more or less strong  
577 when framed in terms of states rather than changes. To explore this possibility, we conducted an  
578 additional study, comparing the association between political ideology and the standard CAFU  
579 versus a modified version of the scale. The standard version of the CAFU was designed to  
580 capture lay theories about future changes in financial well-being as usual, which we refer to in  
581 this section as “CAFU Changes.” The modified version of the CAFU was designed to capture lay  
582 theories about current states of financial well-being by asking participants to evaluate various  
583 causes of “whether a person is rich or poor,” which we refer to in this section as “CAFU States.”  
584 See the Supplemental Material for details on the study and its results.

585 We first examined the factor structure and tested for measurement invariance, finding no  
586 evidence that the factor structure of CAFU States is different from CAFU Changes. We then  
587 examined the associations between political ideology and the Rewarding, Rigged, and Random  
588 subscales, respectively. For both versions, participants who rated themselves as more politically  
589 conservative tended to score higher on the Rewarding dimension ( $r_{\text{Changes}} = 0.35, p < .001; r_{\text{States}}$   
590  $= 0.31, p < .001$ ), lower on the Rigged dimension ( $r_{\text{Changes}} = -0.34, p < .001; r_{\text{States}} = -0.43, p <$   
591  $.001$ ), and lower on the Random dimension ( $r_{\text{Changes}} = -0.08, p = .019; r_{\text{States}} = -0.20, p < .001$ ).  
592 See Table 9 for the results of a series of linear regressions, showing that the positive association  
593 between the Rewarding subscale and political ideology is significantly weaker when using  
594 CAFU States than when using CAFU Changes; the negative association between the Random  
595 subscale and political ideology is significantly stronger when using CAFU States than when  
596 using CAFU Changes; the association between the Rigged subscale and political ideology is not  
597 significantly different when using CAFU States than when using CAFU Changes. Taken  
598 together, these results indicate that the factor structure of lay theories about financial well-being

599 and its directional association with political ideology does not depend on whether people  
600 consider changes versus states of financial well-being. At the same time, the strength of the  
601 association between each subscale and political ideology may vary modestly under these two  
602 versions.

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

608

609 **Table 9**

610 *Prediction of Political Ideology (Higher is More Conservative) by CAFU Subscales and the Interaction with Scale Version (CAFU*  
 611 *States versus CAFU Changes) in a Linear Regression.*

Effect	Model 1			Model 2			Model 3		612
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	613
Rewarding	0.57 [0.47, 0.68]	0.38	<.001						614
Rigged				-0.48[-0.56, -0.39]	-0.35	<.001			615
Random							-0.11[-0.20, -0.02]	-0.08	616
States vs. Changes	0.80 [0.14, 1.47]	0.23	.018	0.48 [-0.07, 1.03]	0.14	.088	0.57 [0.06, 1.09]	0.16	617
Rew. × States	-0.14[-0.28, -0.00]	-0.20	.045						618
Rig. × States				-0.08[-0.20, 0.04]	-0.12	.171			619
Ran. × States							-0.15[-0.28, -0.03]	-0.19	620
Intercept	0.71 [0.19, 1.23]		.007	5.63 [5.24, 6.03]		<.001	3.96 [3.59, 4.33]		621
Observations	1759			1759			1759		622
$R^2$	.11			.15			.02		623
Adjusted $R^2$	.11			.15			.02		624



625

**Study 2**

626

627

628

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.

629

630

631

632

633

634

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.

635

636

637

638

639

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.

640

641

642

643

644

645

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.

646

647

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

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

## 654 **Methods**

### 655 *Participants*

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

### 660 *Procedure & Materials*

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

670 In the second section, participants completed the CAFU Scale as in Study 1. Table 3  
671 displays scale descriptive statistics and measures of internal consistency. We randomized the  
672 order of the first section (the rating and ranking of government goals) and the second section (the  
673 CAFU Scale).

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

## 677 **Results**

678 We specified a linear mixed model—which took each participant by government goal  
679 rating as the unit of analysis (for a total of 3681 observations)—to treat participants as random  
680 effects, thus accounting for the individual-level variation in responses to the government goals.  
681 As fixed effects the model included scores on the three subscales of the CAFU (Rewarding,  
682 Rigged, and Random), the government goal (Incentivizing, Redistribution, and Risk-pooling),  
683 and the nine interactions between the three CAFU subscales and three government goals. Our  
684 key prediction is that six of these nine interactions will be significant such that rating on a given  
685 CAFU subscale (e.g., Rewarding) is more positively associated with rated importance of the  
686 most compatible government goal (i.e., Incentivizing) than the two less compatible goals (i.e.,  
687 Redistribution and Risk-pooling). We make no prediction concerning the relative associations  
688 between the government goals hypothesized to be less compatible with a given CAFU subscale.  
689 To test our key hypotheses, we examined the fixed interaction effects between government goal  
690 and Rewarding, Rigged, and Random.<sup>5</sup>

---

<sup>5</sup> 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,

691           The results of this analysis show that five of the six predicted two-way interactions were  
692 statistically significant (see Table 10 and Figure 6). Higher scores on the Rewarding subscale are  
693 associated more positively with rated importance of the Incentivizing goal than rated importance  
694 of the Redistribution goal and the Risk-pooling goal. Higher scores on the Rigged subscale are  
695 associated more positively with rated importance of the Redistribution goal than rated  
696 importance of the Incentivizing goal and the Risk-pooling goal. Higher scores on the Random  
697 subscale are associated more positively with rated importance of the Risk-pooling goal than rated  
698 importance of the Incentivizing goal. The one predicted interaction for which we find no support  
699 is between the Random subscale and rated importance of the Risk-pooling goal compared to the  
700 Redistribution goal. Table 10 shows that we find similar results when controlling for political  
701 ideology and its interaction with rated importance of each of the three government goals. We  
702 present a similar analysis of absolute rather than signed associations in the Supplemental  
703 Material.

704           To better understand the rated importance of the three goals, we can examine the  
705 differences in Figure 6 at the low end and the high end of the three CAFU subscales. For  
706 instance, participants on the low end of the Rewarding subscale rated the Incentivizing goal as  
707 less important than the Redistribution and Risk-pooling goals. Participants on the high end of the  
708 Rewarding subscale rated the Incentivizing goal as more important than the Risk-pooling goal,  
709 which is again rated more important than the Incentivizing argument.

710           Figure 6 also shows a main effect that we can interpret: scores on the Rigged subscale are  
711 associated positively with rated importance of all three government goals, also when controlling  
712 for political ideology. Although we did not predict this effect, in hindsight it strikes us as not

---

2018) and the R-packages lme4 (Version 1.1.21; Bates et al., 2015), and lmerTest (Version 3.1.0; Kuznetsova et al., 2017).

713 surprising that participants scoring higher on the Rigged subscale are more supportive of all three  
714 government goals.  
715

716 **Table 10**

717 *Study 2 Prediction of Rated Importance of Government Goals by Fixed Effects of Interest,*  
 718 *Controlling for Political Ideology and Its Interaction with Government Goal (Model 2) in*  
 719 *Linear Mixed Models.*

Effect	Model 1			Model 2		
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>
Rewarding	0.06 [-0.02, 0.13]	0.04	.125	0.13 [0.06, 0.21]	0.09	.001
Rigged	0.29 [0.22, 0.35]	0.23	<.001	0.21 [0.14, 0.27]	0.17	<.001
Random	0.01 [-0.06, 0.08]	0.01	.754	0.02 [-0.05, 0.08]	0.01	.637
Political ideology				-0.17 [-0.22, -0.12]	-0.19	<.001
Pool. vs. Inc.	-0.16 [-0.67, 0.35]	-0.14	.545	0.06 [-0.48, 0.59]	-0.14	.834
Red. vs. Inc.	-0.80 [-1.31, -0.29]	-0.43	.002	-0.23 [-0.76, 0.30]	-0.43	.400
Red. vs. Pool.	-0.64 [-1.15, -0.13]	-0.29	.015	-0.29 [-0.82, 0.25]	-0.29	.293
Rewarding $\times$ Pool. vs. Inc.	-0.21 [-0.28, -0.14]	-0.14	<.001	-0.19 [-0.26, -0.11]	-0.13	<.001
Rewarding $\times$ Red. vs. Inc.	-0.30 [-0.37, -0.23]	-0.21	<.001	-0.23 [-0.31, -0.16]	-0.16	<.001
Rewarding $\times$ Red. vs. Pool.	-0.09 [-0.16, -0.02]	-0.06	.013	-0.05 [-0.12, 0.03]	-0.03	.220
Rigged $\times$ Pool. vs. Inc.	0.15 [0.08, 0.21]	0.12	<.001	0.12 [0.05, 0.19]	0.10	<.001
Rigged $\times$ Red. vs. Inc.	0.32 [0.25, 0.38]	0.26	<.001	0.24 [0.18, 0.31]	0.20	<.001
Rigged $\times$ Red. vs. Pool.	0.17 [0.11, 0.23]	0.14	<.001	0.12 [0.06, 0.19]	0.10	<.001
Random $\times$ Pool. vs. Inc.	0.08 [0.02, 0.15]	0.07	.011	0.08 [0.02, 0.15]	0.07	.012
Random $\times$ Red. vs. Inc.	0.06 [-0.01, 0.12]	0.05	.077	0.06 [-0.01, 0.12]	0.05	.074
Random $\times$ Red. vs. Pool.	-0.03 [-0.09, 0.04]	-0.02	.441	-0.02 [-0.09, 0.04]	-0.02	.475
Pol. id. $\times$ Pool. vs. Inc.				-0.06 [-0.11, -0.01]	-0.07	.011
Pol. id. $\times$ Red. vs. Inc.				-0.17 [-0.21, -0.12]	-0.19	<.001
Pol. id. $\times$ Red. vs. Pool.				-0.11 [-0.15, -0.06]	-0.12	<.001
Intercept	3.78 [3.24, 4.31]		<.001	4.33 [3.79, 4.87]		<.001
Observations	3621			3612		
Pseudo $R^2$ (fixed effects)	.21			.28		

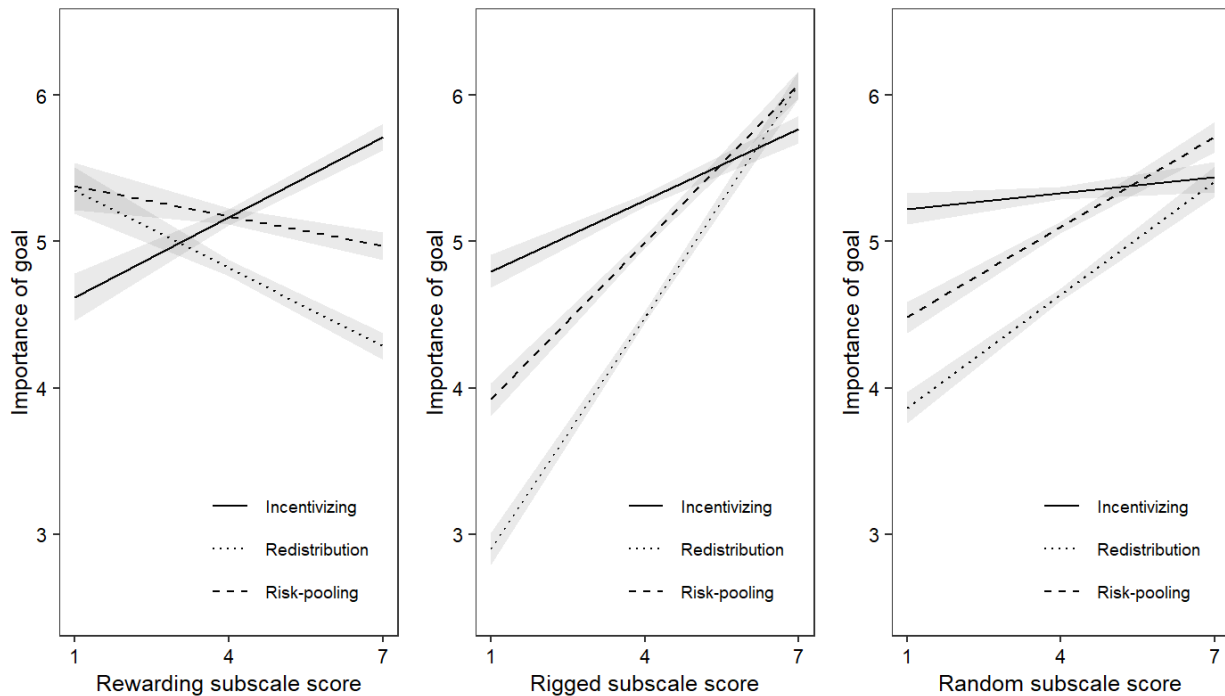
720 *Note.* Shaded rows indicate predicted interactions. Pool. = Risk-pooling goal; Inc. =

721 Incentivizing goal; Red. = Redistribution goal.

722

723 **Figure 6**

724 *Study 2 Prediction of Rated Importance of Each of the Three Government Goals by Rewarding,*  
 725 *Rigged, and Random Subscales, Controlling for Political Ideology.*



726

727 *Note.* Bands indicate standard errors.

728

729 **Discussion**

730 Study 2 shows that Rewarding, Rigged, and Random beliefs uniquely predict rated  
 731 importance of Incentivizing, Redistribution, and Risk-pooling goals for social welfare policy,  
 732 respectively. While Study 1 showed an association between these lay theories and political  
 733 ideology, the compatibility effect observed in Study 2 remained strikingly similar when  
 734 controlling for political ideology. We now turn to an exploration of how people’s beliefs about

735 changes in financial well-being predict the appeal of different policy messages and political  
736 candidates, controlling for political ideology.

### 737 **Study 3**

738 In Study 3 we asked participants to report the extent to which different types of  
739 arguments would increase or decrease their support for various social welfare policies such as a  
740 food-purchasing assistance program or universal health care. Each of the arguments we use is  
741 intended to highlight a different aspect of the proposed social welfare policy. These arguments  
742 follow logically from the more general government goals found to be compatible with beliefs  
743 about financial well-being in Study 2. Specifically, we predict that scores on the Rewarding  
744 subscale will be more positively associated with the persuasive impact of an Incentivizing  
745 argument, focusing on how the policy would enable and encourage people to work hard and  
746 make desirable life choices, compared to other arguments. Likewise, we predict that scores on  
747 the Rigged subscale will be more positively associated with the persuasive impact of a  
748 Redistribution argument, focusing on how the policy would restore or repair structural unfairness  
749 in society, compared to other arguments. Finally, we predict that scores on the Random subscale  
750 will be more positively associated with the persuasive impact of a Risk-pooling argument,  
751 focusing on how the policy would pool resources to protect all people against the risk of  
752 unforeseeable negative events, compared to other arguments. In a political message or speech,  
753 these types of arguments may be combined. In the present study, however, we ask participants to  
754 evaluate each argument individually. This design allows us to separately examine the  
755 associations between the different beliefs about financial well-being and the persuasive impact of  
756 the different types of arguments.

### 757 **Method**



758 ***Participants***

759 We recruited participants through Amazon's Mechanical Turk ( $N = 517$ ; 54% female,  $M_{\text{age}}$   
760  $= 34.83$ ,  $SD_{\text{age}} = 14.55$ ). We aimed to recruit 500 participants and ended up with partial or  
761 complete data for 517 participants. We removed data of 14 participants before analyses because  
762 they did not give responses for all key variables.

763 ***Procedure & Materials***

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

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

775 Each policy proposal was presented on a separate page and was followed by three different  
776 arguments in favor of the policy: (1) an Incentivizing argument, highlighting how the policy  
777 would provide assistance to those who deserve it most, thereby encouraging people to behave in  
778 a desired way (e.g. "A more extensive food-purchasing assistance program is a good idea  
779 because it would encourage recipients to actively look for work and to purchase healthy foods");  
780 (2) a Redistribution argument, highlighting how the policy would provide assistance to the

781 groups that need it most (e.g., “A more extensive food-purchasing assistance program is a good  
782 idea because it would provide financial assistance to those people who need it most, such as low-  
783 income, unemployed, homeless, or otherwise disadvantaged groups”); and (3) a Risk-pooling  
784 argument, highlighting how the policy would pool tax money to collectively pay in case an  
785 individual experiences an unexpected life event (e.g. “A more extensive food-purchasing  
786 assistance program is a good idea because it would pool tax-money and provide assistance to  
787 every individual who experiences an unexpected life event (e.g., sudden unemployment, divorce,  
788 illness or disability) and cannot afford food”). As a measure of the *persuasive impact* of  
789 arguments we asked participants to rate the extent to which each argument made them more or  
790 less supportive of the proposed policy on an 11-point scale (-5 = “makes me much less  
791 supportive”; 0 = “makes me no more or less supportive”; +5 = “makes me much more  
792 supportive”). The policy descriptions and arguments were presented in an order that was  
793 randomized for each participant.

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

## 798 **Results**

799 We specified a linear mixed model—which took each participant by policy argument rating  
800 as the unit of analysis (for a total of 6204 observations)—to treat participants as random effects.  
801 As fixed effects the model included scores on the three subscales of the CAFU (Rewarding,  
802 Rigged, and Random), the policy argument (Incentivizing, Redistribution, and Risk-pooling),

803 and the nine interactions between the three CAFU subscales and three policy arguments.<sup>6</sup> Our  
804 key prediction is that six of these nine interactions will be significant such that rating on a given  
805 CAFU subscale (e.g., Rewarding) is more positively associated with persuasive impact of the  
806 most compatible policy argument (i.e., Incentivizing) than the two less compatible arguments  
807 (i.e., Redistribution and Risk-pooling). We make no prediction concerning the relative  
808 associations between the policy arguments hypothesized to be less compatible with a given  
809 CAFU subscale.

810 The results of this analysis show that all six predicted two-way interactions were  
811 statistically significant (see Table 11 and Figure 7). Higher scores on the Rewarding subscale are  
812 associated more positively with persuasive impact of the Incentivizing argument than persuasive  
813 impact of the Redistribution argument and the Risk-pooling argument. Higher scores on the  
814 Rigged subscale are associated more positively with persuasive impact of the Redistribution  
815 argument than persuasive impact of the Incentivizing argument and the Risk-pooling argument.  
816 Higher scores on the Random subscale are associated more positively with persuasive impact of  
817 the Risk-pooling argument than persuasive impact of the Incentivizing argument and the  
818 Redistribution argument. Table 11 shows that we find similar results when controlling for  
819 political ideology and its interaction with persuasive impact of each of the policy arguments. We  
820 present a similar analysis of absolute rather than signed associations in the Supplemental  
821 Material.

822 To better understand the persuasiveness of the three types of messages, we can examine the  
823 differences in Figure 7 at the low end and the high end of the three CAFU subscales. For

---

<sup>6</sup> 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.

824 instance, for participants on the low end of the Rigged subscale, all three types of arguments are  
825 equally persuasive. For participants on the high end of the Rigged subscale, the Redistribution  
826 argument is more persuasive than the Risk-pooling argument, which is again more persuasive  
827 than the Incentivizing argument.

828 Figure 7 also shows two main effects that we can interpret: scores on the Rigged and the  
829 Random subscales are associated positively with persuasive impact of all three arguments, also  
830 when controlling for political ideology. While we did not predict these effects, in hindsight it  
831 strikes us as unsurprising that participants scoring higher on the Rigged and Random subscales  
832 are more easily persuaded to support government interference in all four policy domains,  
833 regardless of the arguments that are used to support it.

834

835 **Table 11**836 *Study 3 Prediction of Persuasive Impact of Policy Arguments by Fixed Effects of Interest,*837 *Controlling for Political Ideology and its Interaction with Policy Argument (Model 2) in Linear*838 *Mixed Models.*

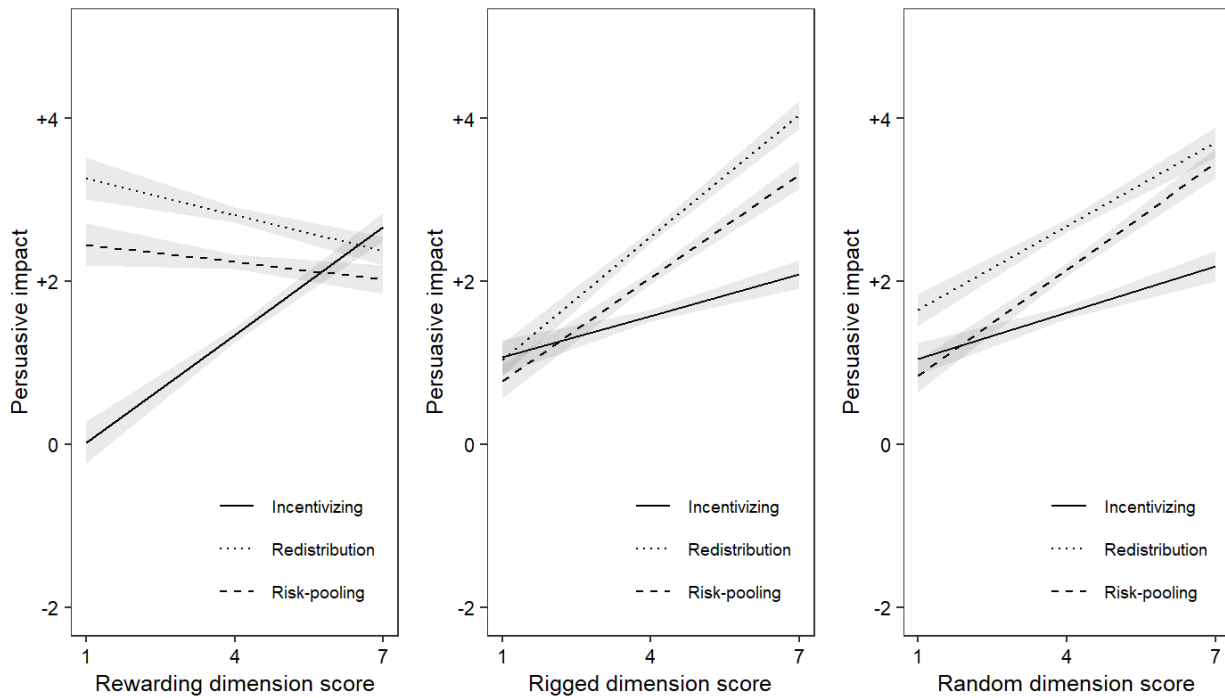
Effect	Model 1			Model 2		
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>
Rewarding	0.33 [0.20, 0.45]	0.15	<.001	0.36 [0.23, 0.48]	0.17	<.001
Rigged	0.24 [0.12, 0.36]	0.13	<.001	0.20 [0.08, 0.33]	0.11	.001
Random	0.16 [0.03, 0.28]	0.08	.016	0.16 [0.04, 0.29]	0.08	.010
Political ideology				-0.00[-0.01, 0.00]	-0.04	.170
Pool. vs. Inc.	0.25 [0.86, 2.26]	0.22	<.001	0.25 [1.43, 2.86]	0.22	<.001
Red. vs. Inc.	0.39 [1.83, 3.22]	0.43	<.001	0.39 [2.45, 3.88]	0.43	<.001
Red. vs. Pool.	0.97 [0.27, 1.67]	0.21	.007	1.03 [0.31, 1.74]	0.21	.005
Edu. vs. Dis.	1.56 [0.11, 0.38]	0.10	<.001	2.14 [0.13, 0.39]	0.10	<.001
Food. vs. Dis.	2.53 [0.12, 0.38]	0.10	<.001	3.17 [0.12, 0.39]	0.10	<.001
Hea. vs. Dis.	0.24 [0.25, 0.52]	0.15	<.001	0.26 [0.26, 0.52]	0.16	<.001
Rewarding $\times$ Pool. vs. Inc.	-0.48[-0.58, -0.38]	-0.22	<.001	-0.38[-0.48, -0.27]	-0.17	<.001
Rewarding $\times$ Red. vs. Inc.	-0.56[-0.66, -0.46]	-0.26	<.001	-0.44[-0.55, -0.34]	-0.21	<.001
Rewarding $\times$ Red. vs. Pool.	-0.08[-0.18, 0.02]	-0.04	.129	-0.07[-0.17, 0.04]	-0.03	.200
Rigged $\times$ Pool. vs. Inc.	0.16 [0.06, 0.26]	0.08	.001	0.04 [-0.06, 0.14]	0.02	.441
Rigged $\times$ Red. vs. Inc.	0.29 [0.20, 0.39]	0.16	<.001	0.16 [0.06, 0.27]	0.09	.002
Rigged $\times$ Red. vs. Pool.	0.13 [0.04, 0.23]	0.07	.007	0.12 [0.02, 0.23]	0.07	.018
Random $\times$ Pool. vs. Inc.	0.13 [0.03, 0.23]	0.07	.012	0.16 [0.05, 0.26]	0.08	.003
Random $\times$ Red. vs. Inc.	-0.03[-0.13, 0.07]	-0.01	.585	-0.00[-0.10, 0.10]	0.00	.963
Random $\times$ Red. vs. Pool.	-0.16[0.26, -0.06]	-0.08	.002	-0.16[-0.26, -0.06]	-0.08	.002
Pol. id. $\times$ Pool. vs. Inc.				-0.02[-0.02, -0.01]	-0.17	<.001
Pol. id. $\times$ Red. vs. Inc.				-0.02[-0.02, -0.01]	-0.19	<.001
Pol. id. $\times$ Red. vs. Pool.				-0.00[-0.01, 0.00]	-0.02	.505
Intercept	4.21 [3.34, 5.08]		<.001	4.36 [3.48, 5.23]		<.001
Observations	6203			6191		
Pseudo $R^2$ (fixed effects)	.12			.15		

839 *Note.* Shaded rows indicate predicted interactions. Pool. = Risk-pooling goal; Inc. =  
 840 Incentivizing goal; Red. = Redistribution goal; Edu. = Tuition-free higher education; Dis. =  
 841 Disaster recovery program; Food. = Food purchasing assistance; Hea. = Universal health  
 842 coverage.

843

844 **Figure 7**

845 *Study 3 Prediction of Persuasive Impact of Each of the Three Policy Arguments by Rewarding,*  
 846 *Rigged, and Random Subscales, Controlling for Political Ideology.*



847

848 *Note.* Bands indicate standard errors.

849

850 **Discussion**

851 Study 3 shows that people with different lay theories about changes in financial well-being  
 852 are persuaded by different arguments in favor of various social welfare policies. In particular, we

853 find that Incentivizing arguments are especially persuasive to people scoring high (versus low)  
854 on the Rewarding subscale; Redistribution arguments are especially persuasive to people scoring  
855 high (versus low) on the Rigged subscale; and Risk-pooling arguments are especially persuasive  
856 to people scoring high (versus low) on the Random subscale.

#### 857 **Study 4**

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

#### 862 **Method**

##### 863 *Participants*

864 We recruited participants through Amazon's Mechanical Turk ( $N = 836$ ; 57% female,  $M_{\text{age}}$   
865  $= 34.34$ ,  $SD_{\text{age}} = 11.12$ ). We aimed to recruit 1200 participants and ended up with partial or  
866 complete data for 1283 participants. We removed data of 50 participants before analyses because  
867 they did not give responses for all key variables. Also, because this study required participants to  
868 read a greater number of arguments per response than previous studies, we preregistered a plan  
869 to remove participants who spent less than 15 seconds reading at least one of the three  
870 candidates' statements. This led us to remove data of an additional 397 participants.

##### 871 *Procedure & Materials*

872 In the first section of the survey, we asked participants to imagine that they would be  
873 choosing between three political candidates in a local election. We presented participants with  
874 each candidate's views concerning higher education, disaster recovery, and food purchasing  
875 assistance. One candidate articulated Incentivizing arguments for all three policies, stating that

876 government programs should encourage desirable behavior by helping people who deserve it  
877 most (e.g., “The government should improve the higher education system by giving financial  
878 support to students, conditional on their academic performance. This way, the system would  
879 provide financial incentives to successful students who deserve it most, thereby motivating all  
880 students to work hard and strive for excellence.”) A second candidate articulated Redistribution  
881 arguments, stating that government programs should use tax money to help disadvantaged  
882 groups in society (e.g., “The government should invest tax money to improve the higher  
883 education system, by providing financial support to students from disadvantaged backgrounds or  
884 from low-income households. In other words, the system should assist those who would  
885 otherwise not have the means to pay for higher education.”) A third candidate articulated Risk-  
886 pooling arguments, stating that government programs should pool tax-money to cover for the  
887 risk of unfortunate events (e.g., “The government should improve the higher education system by  
888 creating a large pool of money which can be used to collectively pay for the education of every  
889 individual, regardless of whether arbitrary circumstances have left them more or less able to  
890 pay.”) We labeled candidates generically (“Candidate A,” “Candidate B,” and “Candidate C.”)

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



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

## 902   **Results**

### 903   *Confirmatory Analyses*

904           We specified a linear mixed model—which took each participant by candidate rating as the  
905   unit of analysis (for a total of 2508 observations)—to treat participants as random effects. As  
906   fixed effects the model included scores on the three subscales of the CAFU (Rewarding, Rigged,  
907   and Random), the candidate (Incentivizing, Redistribution, and Risk-pooling), and the nine  
908   interactions between the three CAFU subscales and three candidates.<sup>7</sup> Our key prediction is that  
909   six of these nine interactions will be significant such that rating on a given CAFU subscale (e.g.,  
910   Rewarding) is more positively associated with rated support for the most compatible candidate  
911   (i.e., Incentivizing) than the two less compatible candidates (i.e., Redistribution and Risk-  
912   pooling). We make no prediction concerning the relative associations between the candidates  
913   hypothesized to be less compatible with a given CAFU subscale.

914           The results of this analysis show that five of the six predicted two-way interactions were  
915   statistically significant (see Table 12 and Figure 8). Higher scores (versus lower) on the  
916   Rewarding subscale are associated more positively with rated support for the Incentivizing  
917   candidate than the Redistribution candidate and the Risk-pooling candidate. Higher scores  
918   (versus lower) on the Rigged subscale are associated more positively with rated support for the

---

<sup>7</sup> 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.

919 Redistribution candidate than the Incentivizing candidate. Higher scores (versus lower) on the  
920 Random subscale are associated more positively with rated support for the Risk-pooling  
921 candidate than the Incentivizing candidate and the Redistribution candidate. The one predicted  
922 interaction for which we find no support is between the Rigged subscale and rated support for the  
923 Redistribution candidate compared to the Risk-pooling candidate. Table 12 shows that we find a  
924 qualitatively identical pattern when controlling for political ideology and its interaction with  
925 rated support for each of the three candidates. We present a similar analysis of absolute rather  
926 than signed associations in the Supplemental Material.

927

928

929 **Table 12**930 *Study 4 Prediction of Rated Support for Candidates by Fixed Effects of Interest, Controlling for*931 *Political Ideology and its Interaction with Candidate (Model 2) in Linear Mixed Models.*

Effect	Model 1			Model 2		
	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>	<i>b</i> [95% <i>CI</i> ]	$\beta$	<i>p</i>
Rewarding	0.76 [0.61, 0.92]	0.31	<.001	0.57 [0.41, 0.72]	0.23	<.001
Rigged	-0.39[-0.53, -0.25]	-0.19	<.001	-0.17[-0.32, -0.03]	-0.08	.019
Random	0.01 [-0.14, 0.17]	0.01	.855	0.05 [-0.10, 0.19]	0.02	.549
Political ideology				0.47 [0.35, 0.58]	0.28	<.001
Pool. vs. Inc.	0.62 [-0.94, 2.17]	0.23	.437	4.46 [2.83, 6.08]	0.23	<.001
Red. vs. Inc.	1.53 [-0.03, 3.08]	0.49	.055	5.48 [3.85, 7.10]	0.49	<.001
Red. vs. Pool.	0.91 [-0.65, 2.46]	0.25	.252	1.02 [-0.61, 2.64]	0.25	.220
Rewarding × Pool. vs. Inc.	-1.11[-1.33, -0.90]	-0.46	<.001	-0.73[-0.95, -0.51]	-0.30	<.001
Rewarding × Red. vs. Inc.	-1.01[-1.23, -0.79]	-0.41	<.001	-0.61[-0.83, -0.39]	-0.25	<.001
Rewarding × Red. vs. Pool.	0.11 [-0.11, 0.32]	0.04	.342	0.12 [-0.10, 0.33]	0.05	.297
Rigged × Pool. vs. Inc.	0.94 [0.74, 1.14]	0.46	<.001	0.50 [0.29, 0.70]	0.24	<.001
Rigged × Red. vs. Inc.	1.04 [0.84, 1.23]	0.50	<.001	0.58 [0.37, 0.78]	0.28	<.001
Rigged × Red. vs. Pool.	0.10 [-0.10, 0.29]	0.05	.345	0.08 [-0.12, 0.28]	0.04	.440
Random × Pool. vs. Inc.	0.31 [0.09, 0.53]	0.14	.005	0.23 [0.03, 0.44]	0.10	.028
Random × Red. vs. Inc.	0.04 [-0.18, 0.26]	0.02	.719	-0.03[-0.24, 0.17]	-0.01	.751
Random × Red. vs. Pool.	-0.27[-0.49, -0.05]	-0.12	.015	-0.27[-0.48, -0.06]	-0.12	.012
Pol. id. × Pool. vs. Inc.				-0.95[-1.12, -0.79]	-0.58	<.001
Pol. id. × Red. vs. Inc.				-0.98[-1.14, -0.82]	-0.59	<.001
Pol. id. × Red. vs. Pool.				-0.03[-0.19, 0.13]	-0.02	.731
Intercept	4.70 [3.60, 5.80]		<.001	2.88 [1.73, 4.04]		<.001
Observations	2508			2499		
Pseudo $R^2$ (fixed effects)	.19			.25		

932 *Note.* Shaded rows indicate predicted interactions. Pool. = Risk-pooling goal; Inc. =

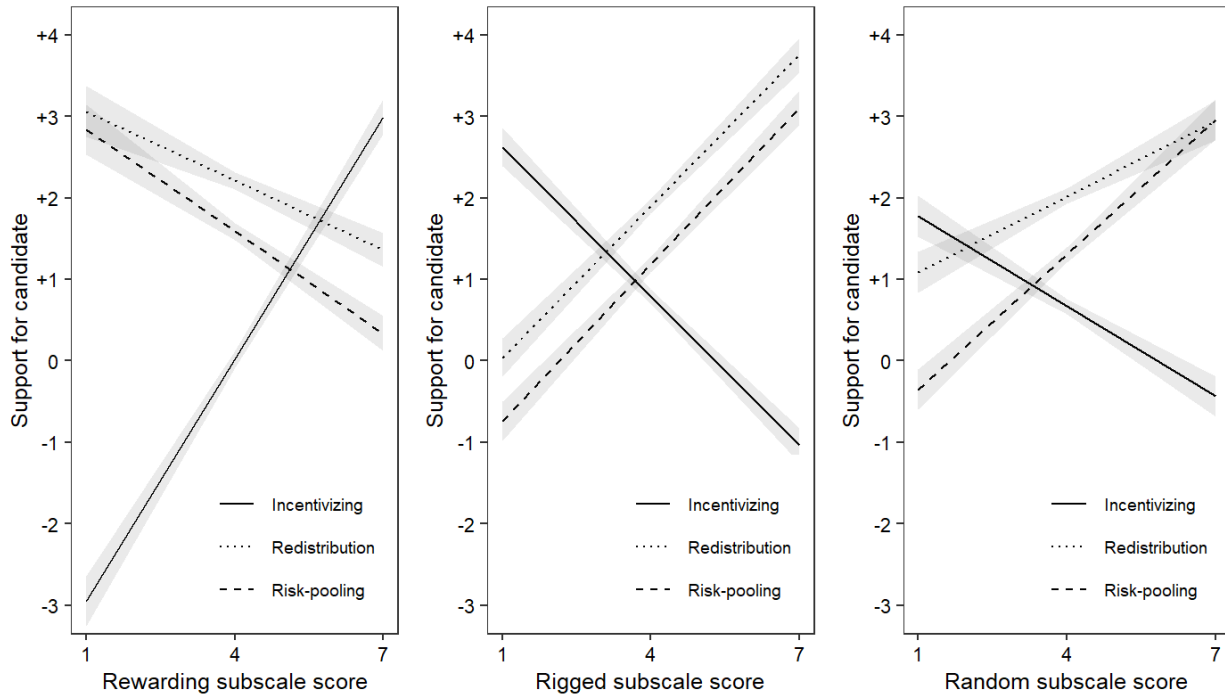
933 Incentivizing goal; Red. = Redistribution goal.

934

935

936 **Figure 8**

937 *Study 4 Prediction of Rated Support for each of the Three Political Candidates by Rewarding,*  
 938 *Rigged, and Random Subscales, Controlling for Political Ideology.*



939

940 *Note.* Bands indicate standard errors.

941

942 ***Exploratory Analyses***

943 To explore the prediction of voting by the Rewarding, Rigged, and Random subscales, we  
 944 conducted three separate binary logistic regressions, one for whether or not participants voted for  
 945 each candidate. The results in Table 13 show that scores on the Rewarding subscale are  
 946 positively associated with the likelihood of voting for the Incentivizing candidate; scores on the  
 947 Rigged subscale are positively associated with the likelihood of voting for the Redistribution  
 948 candidate; scores on the Random subscale are positively associated with the likelihood of voting

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

951

952 **Table 13**

953 *Study 4 Prediction of Likelihood of Voting for Each Candidate by CAFU Subscales in Binary*  
 954 *Logistic Regressions.*

Incentivizing candidate						
Effect	<i>b</i>	<i>SE</i>	$\chi^2$	<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>	$\chi^2$	<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>	$\chi^2$	<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]

955

956 **Discussion**

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

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

### 961 **General Discussion**

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

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

982 affect them financially, either now or in the future (Benabou & Ok, 2001; Meltzer & Richard,  
983 1981; Piketty, 1995). Moreover, people in the United States with a household income below  
984 \$50,000 prefer a more equal distribution of wealth than those with a household income above  
985 \$100,000 (Norton & Ariely, 2011). Meanwhile, the wealthiest 5% of Americans have been found  
986 to prefer lower rates for top income tax and estate tax as compared to the general population  
987 (Cohn et al., 2019).

988 This said, one's current financial status cannot fully explain disagreements concerning  
989 economic redistribution and social welfare policy. Although the poor are generally more in favor  
990 of redistribution, they tend to hold less favorable views of redistribution to the extent that they  
991 see opportunities to move up the economic ladder (Alesina & La Ferrara, 2005; Bjørnskov et al.,  
992 2013; Shariff et al., 2016). People also care about the process through which the distribution is  
993 determined, even if they themselves have no stake in the matter (Almás et al., 2020; Cohn et al.,  
994 2019; Fisman, et al., 2015; Fisman, et al., 2017; Starmans et al., 2017; Trump, 2020; Tyler,  
995 2011).

996 A more complete understanding of the sources of policy preferences requires an accurate  
997 model of how people think about changes in financial well-being. The findings in this article  
998 confirm a model that combines perceptions of individual control with a distinction between the  
999 perceived knowability and perceived randomness of uncertainty in financial well-being, yielding  
1000 a three-dimensional model. Importantly, these lay theories predict support for different  
1001 candidates and messages, even when controlling for self-interest (as indicated by income and  
1002 other demographics) and political ideology.

1003 **Scale Development, Construct Validity, and Generalizability**

1004 We introduced the nine-item CAFU Scale to capture lay theories of financial well-being  
1005 along three dimensions. We derived the dimensional structure of this scale by synthesizing two  
1006 streams of literature: one that examines the relationship between perceived fairness and control,  
1007 and one that examines distinct dimensions of subjective uncertainty. These scale items were  
1008 adapted and expanded from the EARS—a scale designed to capture the epistemic and aleatory  
1009 dimensions of uncertainty (Fox, Tannenbaum et al., 2021).

1010 The scale-development method we used has the advantage of yielding a clear  
1011 conceptualization of the underlying construct(s), and a scale that is grounded in logic and prior  
1012 research. Based on the previous literature and the examination of the scale’s structural and  
1013 concurrent validity in Study 1, we believe that the CAFU Scale is reasonably comprehensive at  
1014 capturing lay theories of financial well-being. Factors that are beyond an individual's control can  
1015 be perceived as high or low in epistemicness and as high or low in aleatoriness, as measured by  
1016 the epistemic-discretionary (i.e., Rewarding) subscale and the epistemic-exogenous (i.e., Rigged)  
1017 subscale, respectively. Factors that are within the individual's control are, by its very nature,  
1018 knowable and not random, and are therefore captured by the aleatory-exogenous (i.e., Random)  
1019 subscale.

1020 Naturally, theory-driven, deductive scale development has its limitations. Although we have  
1021 strong a priori reasons to assume that the three-dimensional structure can capture a  
1022 comprehensive range of lay theories concerning changes or differences in financial well-being, it  
1023 is certainly possible that our scale misses some lay theories that may occur to some individuals.  
1024 As a post-hoc test of the comprehensiveness of our scale, we asked 50 self-reported Democratic  
1025 voters and 50 self-reported Republican voters to “list all of the causes, reasons, or factors that  
1026 come to mind” that explain changes or differences in financial well-being for individuals. In



1027 total, these 100 participants provided 524 responses. We next asked participants to assign their  
1028 own beliefs to one of three categories as characterized by the CAFU subscales or a fourth  
1029 residual category (“none of the above fits well”). A coder independently assigned each listed  
1030 belief to a category, agreeing with participants 74.6% of the time. We note that the participants  
1031 only used the residual category themselves for 4.6% of listed beliefs. Further details are  
1032 provided in the Supplemental Materials, Study S1A.

1033 We also acknowledge that we did not have direct empirical evidence to confirm the scale’s  
1034 content validity when we ran the studies reported in this paper. It is possible that the items of  
1035 each subscale are not representative of all aspects of the underlying dimension that they are  
1036 designed to capture (Simms, 2008). For instance, it is possible that some individuals believe that  
1037 changes in financial well-being are knowable and outside of the individual’s control in the sense  
1038 that the poor are structurally advantaged over the rich. This belief would not be captured by all  
1039 items on the Rigged subscale, because we use the item “...depends on the person’s initial status  
1040 and wealth (i.e., rich tend to get richer and poor tend to get poorer).” This said, we note that in  
1041 the aforementioned reasons-generating exercise detailed in in Supplemental Study S1A, we saw  
1042 very few instances in which participants spontaneously generated thoughts about the system  
1043 being rigged in favor of the poor.

1044 Interestingly, it may be the case that Rigged attributions are associated with perceptions of  
1045 human causes (e.g., discrimination by a landlord) and Random attributions are associated with  
1046 perceptions of non-human causes (e.g., a natural disaster). This said, both Rigged and Random  
1047 constructs can logically accommodate both human and non-human causes. For instance, a car  
1048 accident may harm a person’s financial well-being in a random way but be attributed to a human  
1049 cause. Likewise, an algorithm for determining who gets a mortgage may discriminate against

1050 particular populations in a “rigged” way but be attributed to a non-human cause. While we  
1051 believe that these latter examples are exceptions, we designed our scale to be able to capture both  
1052 human and non-human causes.

1053 Finally, we hasten to add that further research will be needed to generalize our conclusions  
1054 concerning the CAFU’s ability to predict political preferences and policy message preferences.  
1055 First, we tested only a small set of government goals, policies, and policy arguments. In Studies  
1056 3 and 4, we selected proposals for social welfare policy that we expected to be somewhat  
1057 familiar to participants based on the political debate in the United States at the time that the  
1058 studies were conducted. In Studies 2-4, we selected government goals and policy arguments that  
1059 we expected to be compatible with the three proposed dimensions of beliefs about changes in  
1060 financial well-being. Second, we surveyed only Americans at a particular time in history. Thus,  
1061 our findings relate to contemporary thinking regarding the selected set of policies and messages,  
1062 and do not necessarily generalize to different contexts or cultures (Gergen, 1973). Future  
1063 research might explore the generalizability of these findings.

#### 1064 **The Emergence of Lay Theories About Financial Well-being**

1065 People’s lay theories about what causes financial well-being to change over time may or  
1066 may not accord with objective causes and are largely influenced by subjective interpretation. For  
1067 instance, if an able-bodied individual gets poorer because he does not work very hard, an  
1068 observer may see this as laziness in a system that is inherently rewarding. Alternatively, an  
1069 observer may construe this behavior as the result of the individual being frustrated by a system  
1070 that is rigged against him and has repeatedly thwarted his previous attempts to get ahead. Finally,  
1071 an observer may see this behavior as the result of bad luck in having been born with traits that  
1072 are not rewarded in life—losing what Warren Buffet once referred to as the “ovarian lottery”

1073 (Weisenthal, 2013). Of course, these attributions are not mutually exclusive and may vary in  
1074 their relative salience; as we have shown, perceptions of causes of change in financial well-being  
1075 vary along three distinct dimensions.

1076 There is ample evidence that people's experiences shape the way they view the structure of  
1077 society, including the causes of changes and differences in financial well-being (Browman et al.,  
1078 2019; Hunt, 1996; Kunovich & Slomeczynski, 2007; Manstead, 2018; McCall et al., 2017; Mijs,  
1079 2018, 2019; Shariff et al., 2016; Wiwad et al., 2021). Of course, individuals' views of economic  
1080 inequality and mobility may be systematically biased (Alesina et al., 2018; Cruces, et al., 2013;  
1081 Davidai & Gilovich, 2015; Hauser & Norton, 2017; Hvidberg et al., 2020; Kraus et al., 2017;  
1082 Kraus & Tan, 2015; Kiatpongsan & Norton, 2014; Norton & Ariely, 2011; Norton, et al., 2014).  
1083 For instance, Americans' underestimation of inequality in their country may cause them to  
1084 overestimate the degree of economic mobility, due to a greater perception that economic  
1085 outcomes are within an individual's control (Davidai, 2018). Lay theories may derive from a  
1086 need to rationalize inequality, fulfilling a basic psychological need to understand and explain the  
1087 world around us (Benabou & Tirole, 2006; Day & Fiske, 2017; Jost et al., 2004; Kraus & Tan,  
1088 2015; Piff et al., 2018; Trump, 2018; Trump & White, 2018).

1089 Future research could further investigate how personal history and context shape individual  
1090 differences on the Rewarding, Rigged, and Random dimensions. Recent macroeconomic trends  
1091 could be systematically related to the distribution of lay theories about changes in financial well-  
1092 being. For instance, following recessions more people may come to view the system as less  
1093 inherently rewarding. Alternatively, individual experience may lead people to shift their lay  
1094 beliefs over time. For instance, a person suddenly knocked into poverty by a natural disaster may  
1095 come to appreciate the critical role of randomness in determining changes in financial well-

1096 being. Finally, one might imagine that contextual cues could temporarily shift people's lay  
1097 theories. For instance, news about protests against discrimination may cause some individuals to  
1098 temporarily appreciate the extent to which the system is rigged. Indeed, in one study, after  
1099 participants were prompted to consider why some people are poor for reasons beyond their  
1100 control, they came to favor egalitarian and redistributive policies (Piff et al., 2020).

### 1101 **Crafting Persuasive Policy Messages**

1102 In this article we have demonstrated that understanding people's causal attributions of  
1103 financial uncertainty can inform the design of more persuasive policy messages. We identified  
1104 specific policy arguments that are compatible with each dimension and demonstrated how these  
1105 arguments can be put to use in the political arena. A natural next step would be to test whether or  
1106 not these insights can be used to win over specific groups of voters and build coalitions.

1107 Effective targeted messaging requires an ability to identify individual beliefs along the  
1108 Rewarding, Rigged, and Random dimensions, preferably based on publicly available or  
1109 observable socio-demographic variables. As a preliminary exploration of this approach we  
1110 examined data from Study 1, conducting a series of linear regressions with Rewarding, Rigged,  
1111 and Random scores as the dependent variables and the full set socio-demographic characteristics  
1112 as predictors.<sup>8</sup> The strongest predictor of the Rewarding subscale was higher rated importance of  
1113 religion ( $\beta = 0.18, p < .001$ ). Meanwhile, the strongest predictor of the Random subscale was  
1114 lower household income ( $\beta = -0.10, p = .007$ ). Interestingly, the strongest predictor of the Rigged  
1115 dimension was marital status ( $\beta = -0.09, p = .013$ ); participants who were not married scored  
1116 higher on the Rigged subscale. While these results provide a first hint about how specific groups

---

<sup>8</sup> See the Supplemental Material for complete results of these analyses.

1117 might be targeted, further research is needed to identify differences in lay theories of financial  
1118 well-being from combinations of observable variables.

1119         One obvious way of identifying subgroups for tailored messaging opportunities is based on  
1120 political ideology and/or political party affiliation. As we have shown, conservatives, on average,  
1121 believe that changes in financial well-being are more Rewarding, less Rigged, and slightly less  
1122 Random, as compared to liberals. Thus, when the goal is to persuade conservatives to support a  
1123 particular social welfare policy, it may be most persuasive to emphasize an Incentivizing  
1124 message about how the policy would create opportunities for hard-working individuals to  
1125 prosper without allowing non-deserving individuals to take advantage. In contrast, when the goal  
1126 is to persuade liberals to support the same social welfare policy, it may be most persuasive to  
1127 either emphasize a redistribution message about how the policy would repair structural  
1128 inequalities by helping routinely disadvantaged groups in society, or emphasize a risk-pooling  
1129 message about how the policy would collectively insure everyone against the risk of  
1130 unforeseeable negative outcomes.

1131         In the current studies we find preliminary evidence that people of different political  
1132 ideologies indeed respond differently to policy messages. Figure 9 shows the prediction of the  
1133 different dependent variables by political ideology in Studies 2-4. It is easy to see from the  
1134 Figure that Incentivizing messages tended to garner more support from the most conservative  
1135 individuals than Risk-Pooling and Redistribution messages for government intervention (Study  
1136 2), various social welfare policies (Study 3), and political candidates (Study 4).

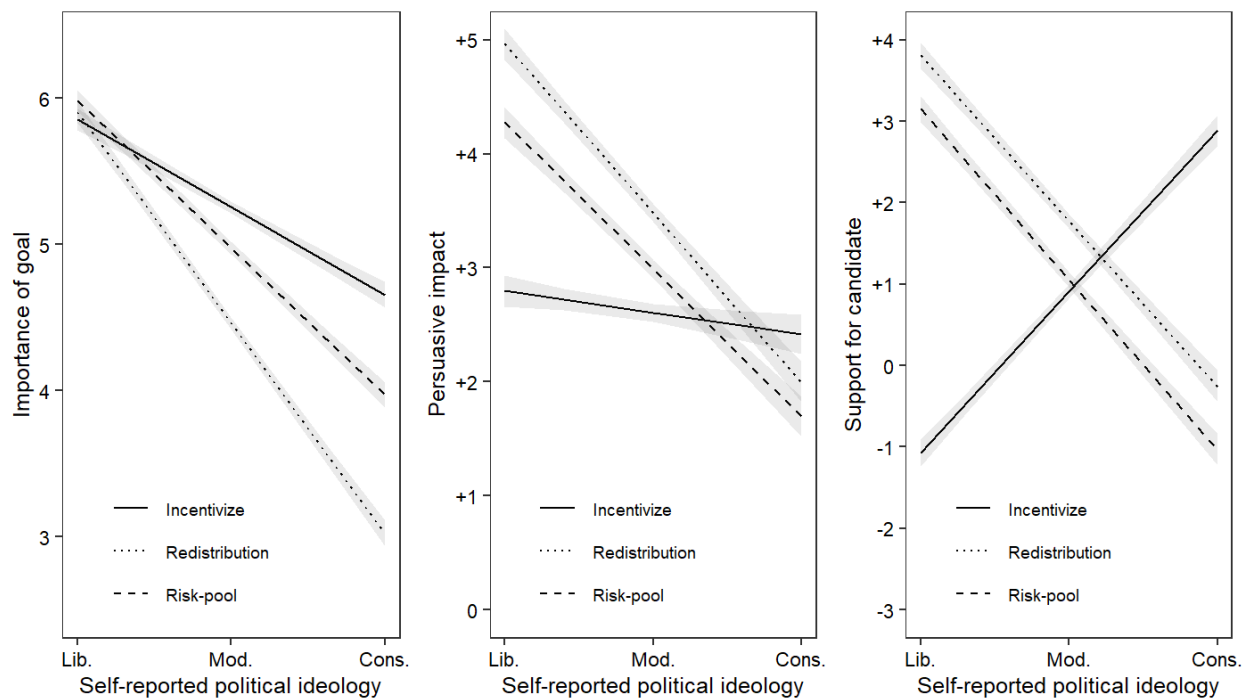
1137         Targeted messaging to different audiences is not always a feasible or preferable strategy.  
1138 This raises the question of whether or not it is possible to craft messages that combine all three  
1139 elements that are uniquely attractive to people with different lay theories. Of course there could

1140 be a risk to combining messages. Adding elements to an otherwise persuasive message that are  
 1141 incompatible with the target audience’s beliefs may backfire and undermine the message’s  
 1142 effectiveness. That is, multiple simultaneous messages could provide something for each  
 1143 constituency to dislike rather than like. Early indications suggest this may not be the case: in a  
 1144 preliminary exploration of this phenomenon we found that under certain conditions, messages  
 1145 that combine Incentivizing, Redistribution, and Risk-pooling elements can broaden support over  
 1146 messages that contain only one of these elements (Bogard et al., 2021).

1147

1148 **Figure 9**

1149 *Prediction of Importance Rating of Government Goals (Study 2, Left Panel), Persuasive Impact*  
 1150 *of Policy Arguments (Study 3, Middle Panel), and Rated Support for Political Candidates (Study*  
 1151 *4, Right Panel) by Political Ideology.*



1152

1153 *Note.* Lib. = Liberal; Mod. = Moderate; Cons. = Conservative. Bands indicate standard errors.

**1154 Bridging the Divide on Social Welfare Policy**

1155       The present findings provide some guidance concerning not only how to more effectively  
1156 customize messages to different groups, but also on how to enhance the appeal of certain policies  
1157 to a broader audience and thus help bridge the political divide. When people disagree about a  
1158 particular policy, this disagreement may stem in part from a failure to define what exactly the  
1159 policy entails—who it helps, on what basis, and with what purpose. It may be possible to draw  
1160 opinions closer together by highlighting different aspects of a policy in a way that speaks to  
1161 multiple lay theories of financial well-being. For instance, previous research finds that supporters  
1162 and opponents of affirmative action had different kinds of policies in mind when judging the  
1163 matter, but that most people from both sides were in favor of an affirmative action policy when it  
1164 was made clear how that policy upheld the (incentivizing) principle of merit (Reyna et al., 2005).  
1165 Similarly, disagreements regarding the social welfare policies studied here—from subsidized  
1166 health care and tuition-free education to food stamps and unemployment benefits—may also  
1167 arise from a lack of shared understanding about such policies. This leaves open the possibility of  
1168 using a broader combination of policy messages that speak to multiple lay theories of financial  
1169 well-being to bridge the political divide.

1170       Ideological and attitudinal divides also exist between people from different countries.  
1171 There is considerable variance in the level and type of welfare spending across countries (Alber,  
1172 2010; Alesina et al., 2001; Schwabish et al., 2006), just as there is variance in public views on  
1173 economic inequality (Kerr, 2014; Kiatpongsan & Norton, 2014; Osberg & Smeeding, 2006; Piff  
1174 et al., 2020; Reeskens & Van Oorschot, 2013). Past research has connected these differences to  
1175 how people in different countries think about the role of luck and effort in determining economic  
1176 outcomes (Alesina & Glaeser, 2004). Future research could revisit this issue for a more detailed

1177 examination of how countries differ in their respective distributions of Rewarding, Rigged, and  
1178 Random beliefs. Such an examination provides some insight into why countries invest in  
1179 different social welfare policies, why particular political candidates or parties are more popular  
1180 in one country than in another, and how consensus regarding social welfare policies can be  
1181 reached across communities with different beliefs, attitudes, and preferences.



**References**

- 1182  
1183 Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and  
1184 objective social status with psychological and physiological functioning: Preliminary data  
1185 in healthy, white women. *Health Psychology, 19*(6), 586–592.  
1186 <https://doi.org/10.1037/0278-6133.19.6.586>
- 1187 Alber, J. (2010). What the European and American welfare states have in common and where  
1188 they differ: Facts and fiction in comparisons of the European social model and the United  
1189 States. *Journal of European Social Policy, 20*(2), 102–125.  
1190 <https://doi.org/10.1177/0958928709358791>
- 1191 Alesina, A., & Angeletos, G. M. (2005). Fairness and redistribution. *American Economic*  
1192 *Review, 95*(4), 960–980. <https://doi.org/10.1257/0002828054825655>
- 1193 Alesina, A., & Glaeser, E. L. (2004). *Fighting poverty in the US and Europe: A world of*  
1194 *difference*. Oxford University Press. <https://doi.org/10.1093/0199267669.003.0001>
- 1195 Alesina, A., Glaeser, E., & Sacerdote, B. (2001). Why doesn't the US have a European-style  
1196 welfare system? *Brooking Papers on Economic Activity, 2001*(2), 187–277.  
1197 <https://doi.org/10.1353/eca.2001.0014>
- 1198 Alesina, A., & La Ferrara, E. (2005). Preferences for redistribution in the land of opportunities.  
1199 *Journal of Public Economics, 89*(5–6), 897–931.  
1200 <https://doi.org/10.1016/j.jpubeco.2004.05.009>
- 1201 Alesina, A., Stantcheva, S., & Teso, E. (2018). Intergenerational mobility and preferences for  
1202 redistribution. *American Economic Review, 108*(2), 521–54.  
1203 <https://doi.org/10.1257/aer.20162015>

- 1204 Almås, I., Cappelen, A. W., & Tungodden, B. (2020). Cutthroat capitalism versus cuddly  
1205 socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians?  
1206 *Journal of Political Economy*, 128(5), 1753–1788. <https://doi.org/10.1086/705551>
- 1207 Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*. Jossey-  
1208 Bass.
- 1209 Alvaredo, F., Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2018). *World inequality report*.  
1210 Harvard University Press. <https://doi.org/10.4159/9780674984769>
- 1211 Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models  
1212 using lme4. *Journal of Statistical Software*, 67(1), 1–48.  
1213 <http://doi.org/10.18637/jss.v067.i01>
- 1214 Benabou, R., & Ok, E. A. (2001). Social mobility and the demand for redistribution: The Poup  
1215 hypothesis. *The Quarterly Journal of Economics*, 116(2), 447–487.  
1216 <https://doi.org/10.1162/00335530151144078>
- 1217 Benabou, R., & Tirole, J. (2006). Belief in a just world and redistributive politics. *The Quarterly*  
1218 *Journal of Economics*, 121(2), 699–746. <https://doi.org/10.1162/qjec.2006.121.2.699>
- 1219 Bizumic, B., & Duckitt, J. (2018). Investigating right wing authoritarianism with a very short  
1220 authoritarianism scale. *Journal of Social and Political Psychology*, 6(1), 129–150.  
1221 <https://doi.org/10.5964/jspp.v6i1.835>
- 1222 Bjørnskov, C., Dreher, A., Fischer, J. A., Schnellenbach, J., & Gehring, K. (2013). Inequality  
1223 and happiness: When perceived social mobility and economic reality do not match.  
1224 *Journal of Economic Behavior & Organization*, 91, 75–92.  
1225 <https://doi.org/10.1016/j.jebo.2013.03.017>

- 1226 Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L.  
1227 (2018). Best practices for developing and validating scales for health, social, and  
1228 behavioral research: A primer. *Frontiers in Public Health*, 6, 149.  
1229 <https://doi.org/10.3389/fpubh.2018.00149>
- 1230 Bobbio, A., Canova, L., & Manganelli, A. M. (2010). Conservative ideology, economic  
1231 conservatism, and causal attributions for poverty and wealth. *Current Psychology*, 29(3),  
1232 222–234. <https://doi.org/10.1007/s12144-010-9086-6>
- 1233 Bogard, J., Ülkümen, G., Krijnen, J. M. T., & Fox, C. R. (2021). Political messaging and  
1234 uncertainty beliefs. Manuscript in Preparation.
- 1235 Browman, A. S., Destin, M., Kearney, M. S., & Levine, P. B. (2019). How economic inequality  
1236 shapes mobility expectations and behaviour in disadvantaged youth. *Nature Human*  
1237 *Behaviour*, 3(3), 214–220. <https://doi.org/10.1038/s41562-018-0523-0>
- 1238 Bullock, H. E., Williams, W. R., & Limbert, W. M. (2003). Predicting support for welfare  
1239 policies: The impact of attributions and beliefs about inequality. *Journal of Poverty*, 7(3),  
1240 35–56. [https://doi.org/10.1300/j134v07n03\\_03](https://doi.org/10.1300/j134v07n03_03)
- 1241 Cappelen, A. W., Hole, A. D., Sørensen, E. Ø., & Tungodden, B. (2007). The pluralism of  
1242 fairness ideals: An experimental approach. *American Economic Review*, 97(3), 818–827.  
1243 <https://doi.org/10.1257/aer.97.3.818>
- 1244 Cappelen, A. W., Konow, J., Sørensen, E. Ø., & Tungodden, B. (2013). Just luck: An  
1245 experimental study of risk-taking and fairness. *American Economic Review*, 103(4),  
1246 1398–1413. <https://doi.org/10.1257/aer.103.4.1398>

- 1247 Carey, J. M., & Paulhus, D. L. (2013). Worldview implications of believing in free will and/or  
1248 determinism: Politics, morality, and punitiveness. *Journal of Personality*, *81*(2), 130–  
1249 141. <https://doi.org/10.1111/j.1467-6494.2012.00799.x>
- 1250 CFPB. (2015). Financial well-being: The goal of financial education. Retrieved from  
1251 [https://files.consumerfinance.gov/f/201501\\_cfpb\\_report\\_financial-well-being.pdf](https://files.consumerfinance.gov/f/201501_cfpb_report_financial-well-being.pdf)
- 1252 Chavanne, D. (2018). Headwinds, tailwinds, and preferences for income redistribution. *Social*  
1253 *Science Quarterly*, *99*(3), 851–871. <https://doi.org/10.1111/ssqu.12477>
- 1254 Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance.  
1255 *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464–504.  
1256 <https://doi.org/10.1080/10705510701301834>
- 1257 Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence  
1258 Erlbaum.
- 1259 Cohn, A., Jessen, L. J., Klasnja, M., & Smeets, P. (2019). Why do the rich oppose redistribution?  
1260 An experiment with America's top 5%. Available at SSRN 3395213.  
1261 <https://doi.org/10.2139/ssrn.3395213>
- 1262 Cozzarelli, C., Wilkinson, A. V., & Tagler, M. J. (2001). Attitudes toward the poor and  
1263 attributions for poverty. *Journal of Social Issues*, *57*(2), 207–227.  
1264 <https://doi.org/10.1111/0022-4537.00209>
- 1265 Cruces, G., Perez-Truglia, R., & Tetaz, M. (2013). Biased perceptions of income distribution and  
1266 preferences for redistribution: Evidence from a survey experiment. *Journal of Public*  
1267 *Economics*, *98*, 100–112. <https://doi.org/10.1016/j.jpubeco.2012.10.009>

- 1268 Dalbert, C. (1999). The world is more just for me than generally: About the personal belief in a  
1269 just world scale's validity. *Social Justice Research, 12*(2), 79–98.  
1270 <https://doi.org/10.1023/A:1022091609047>
- 1271 Davidai, S. (2018). Why do Americans believe in economic mobility? Economic inequality,  
1272 external attributions of wealth and poverty, and the belief in economic mobility. *Journal*  
1273 *of Experimental Social Psychology, 79*, 138–148.  
1274 <https://doi.org/10.1016/j.jesp.2018.07.012>
- 1275 Davidai, S., & Gilovich, T. (2015). Building a more mobile America—One income quintile at a  
1276 time. *Perspectives on Psychological Science, 10*(1), 60–71.  
1277 <https://doi.org/10.1177/1745691614562005>
- 1278 Day, M. V., & Fiske, S. T. (2017). Movin' on up? How perceptions of social mobility affect our  
1279 willingness to defend the system. *Social Psychological and Personality Science, 8*(3),  
1280 267–274. <https://doi.org/10.1177/1948550616678454>
- 1281 Day, M. V., Fiske, S. T., Downing, E. L., & Trail, T. E. (2014). Shifting liberal and conservative  
1282 attitudes using moral foundations theory. *Personality and Social Psychology Bulletin,*  
1283 *40*(12), 1559–1573. <https://doi.org/10.1177/0146167214551152>
- 1284 Duckitt, J., & Sibley, C. G. (2010). Personality, ideology, prejudice, and politics: A dual-process  
1285 motivational model. *Journal of Personality, 78*(6), 1861–1894.  
1286 <https://doi.org/10.1111/j.1467-6494.2010.00672.x>
- 1287 Everett, J. A., Clark, C. J., Meindl, P., Luguri, J. B., Earp, B. D., Graham, J., & Ditto, P. H.  
1288 (2020). Political differences in free will belief are associated with differences in  
1289 moralization. *Journal of Personality and Social Psychology.*  
1290 <https://doi.org/10.1037/pspp0000286>

- 1291 Feagin, J. R. (1972). Poverty: We still believe that God helps those who help themselves.  
1292 *Psychology Today*, 6(6), 101–110.
- 1293 Feather, N. T. (1974). Explanations of poverty in Australian and American samples: The person,  
1294 society, or fate? *Australian Journal of Psychology*, 26(3), 199–216.  
1295 <https://doi.org/10.1080/00049537408255231>
- 1296 Feinberg, M., & Willer, R. (2019). Moral reframing: A technique for effective and persuasive  
1297 communication across political divides. *Social and Personality Psychology Compass*,  
1298 13(12), e12501. <https://doi.org/10.1111/spc3.12501>
- 1299 Fisman, R., Jakiela, P., & Kariv, S. (2017). Distributional preferences and political behavior.  
1300 *Journal of Public Economics*, 155, 1–10. <https://doi.org/10.1016/j.jpubeco.2017.08.010>
- 1301 Fisman, R., Jakiela, P., Kariv, S., & Markovits, D. (2015). The distributional preferences of an  
1302 elite. *Science*, 349(6254), aab0096–aab0096. <https://doi.org/10.1126/science.aab0096>
- 1303 Flake, J. K., Pek, J., & Hehman, E. (2017). Construct validation in social and personality  
1304 research: Current practice and recommendations. *Social Psychological and Personality  
1305 Science*, 8(4), 370–378. <https://doi.org/10.1177/1948550617693063>
- 1306 Fong, C. (2001). Social preferences, self-interest, and the demand for redistribution. *Journal of  
1307 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)
- 1308 Fox, C. R., Goedde-Menke, M., & Tannenbaum, D. (2021). Ambiguity aversion and epistemic  
1309 uncertainty. Working paper, UCLA Anderson School of Management.
- 1310 Fox, C. R., Tannenbaum, D., Ülkümen, G., Walters, D. J., & Erner, C. (2021). Credit, blame,  
1311 luck, and the perceived nature of uncertainty. Manuscript in preparation.

- 1312 Fox, C. R., & Ülkümen, G. (2011). Distinguishing two dimensions of uncertainty. In W. Brun,  
1313 G. Keren, G. Kirkebøen, & H. Montgomery (Eds.), *Perspectives on Thinking, Judging,*  
1314 *and Decision Making* (pp. 21–35). Universitetsforlaget.
- 1315 Frank, R. H. (2016). *Success and luck: Good fortune and the myth of meritocracy*. Princeton  
1316 University Press. <https://doi.org/10.1515/9781400880270>
- 1317 Furnham, A. (1982a). Why are the poor always with us? Explanations for poverty in Britain.  
1318 *British Journal of Social Psychology*, 21(4), 311–322. [https://doi.org/10.1111/j.2044-](https://doi.org/10.1111/j.2044-8309.1982.tb00553.x)  
1319 [8309.1982.tb00553.x](https://doi.org/10.1111/j.2044-8309.1982.tb00553.x)
- 1320 Furnham, A. (1982b). Explanations for unemployment in Britain. *European Journal of Social*  
1321 *Psychology*, 12(4), 335–351. <https://doi.org/10.1002/ejsp.2420120402>
- 1322 Gallup. (1998). Have and have-nots: Perceptions of fairness and opportunity. Retrieved from  
1323 <https://news.gallup.com/poll/9877/havenots-perceptions-fairness-opportunity-1998.aspx>.
- 1324 Gergen, K. J. (1973). Social psychology as history. *Journal of Personality and Social*  
1325 *Psychology*, 26(2), 309–320.
- 1326 Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S., & Ditto, P. (2013). Moral  
1327 foundations theory: The pragmatic validity of moral pluralism. In M. P. Zanna (Ed.),  
1328 *Advances in experimental social psychology* (pp. 55–130). Elsevier.  
1329 <https://doi.org/10.1016/b978-0-12-407236-7.00002-4>
- 1330 Graham, J., Haidt, J., Motyl, M., Meindl, P., Iskiwitch, C., & Mooijman, M. (2018). Moral  
1331 foundations theory: On the advantages of moral pluralism over moral monism. In K.  
1332 Gray & J. Graham (Eds.), *The atlas of moral psychology: Mapping good and evil in the*  
1333 *mind* (pp. 211–222). Guilford Press. [https://doi.org/10.1016/b978-0-12-407236-7.00002-](https://doi.org/10.1016/b978-0-12-407236-7.00002-4)  
1334 [4](https://doi.org/10.1016/b978-0-12-407236-7.00002-4)

- 1335 Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of  
1336 moral foundations. *Journal of Personality and Social Psychology*, *96*(5), 1029–1046.  
1337 <https://doi.org/10.1037/a0015141>
- 1338 Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the  
1339 moral domain. *Journal of Personality and Social Psychology*, *101*(2), 366–385.  
1340 <https://doi.org/10.1037/a0021847>
- 1341 Haidt, J., & Graham, J. (2007). When morality opposes justice: Conservatives have moral  
1342 intuitions that liberals may not recognize. *Social Justice Research*, *20*(1), 98–116.  
1343 <https://doi.org/10.1007/s11211-007-0034-z>
- 1344 Hardisty, D. J., Johnson, E. J., & Weber, E. U. (2010). A dirty word or a dirty world? Attribute  
1345 framing, political affiliation, and query theory. *Psychological Science*, *21*(1), 86–92.  
1346 <https://doi.org/10.1177/0956797609355572>
- 1347 Hauser, O. P., & Norton, M. I. (2017). (Mis)perceptions of inequality. *Current Opinion in*  
1348 *Psychology*, *18*, 21–25. <https://doi.org/10.1016/j.copsyc.2017.07.024>
- 1349 Henry, P. J., Reyna, C., & Weiner, B. (2004). Hate welfare but help the poor: How the  
1350 attributional content of stereotypes explains the paradox of reactions to the destitute in  
1351 America. *Journal of Applied Social Psychology*, *34*(1), 34–58.  
1352 <https://doi.org/10.1111/j.1559-1816.2004.tb02536.x>
- 1353 Hinkin, T. R. (1995). A review of scale development practices in the study of organizations.  
1354 *Journal of Management*, *21*(5), 967–988. <https://doi.org/10.1177/014920639502100509>
- 1355 Hirsh, J. B., DeYoung, C. G., Xu, X., & Peterson, J. B. (2010). Compassionate liberals and polite  
1356 conservatives: Associations of agreeableness with political ideology and moral values.



- 1357            *Personality and Social Psychology Bulletin*, 36(5), 655–664.
- 1358            <https://doi.org/10.1177/0146167210366854>
- 1359    Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., Foels, R., &  
1360            Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and  
1361            measuring preferences for intergroup inequality using the new sdo<sub>7</sub> scale. *Journal of*  
1362            *Personality and Social Psychology*, 109(6), 1003–1028.  
1363            <https://doi.org/10.1037/pspi0000033>
- 1364    Ho, A. K., Sidanius, J., Pratto, F., Levin, S., Thomsen, L., Kteily, N., & Sheehy-Skeffington, J.  
1365            (2012). Social dominance orientation: Revisiting the structure and function of a variable  
1366            predicting social and political attitudes. *Personality and Social Psychology Bulletin*,  
1367            38(5), 583–606. <https://doi.org/10.1177/0146167211432765>
- 1368    Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis:  
1369            Conventional criteria versus new alternatives. *Structural Equation Modeling: A*  
1370            *Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- 1371    Hunt, M. O. (1996). The individual, society, or both? A comparison of Black, Latino, and White  
1372            beliefs about the causes of poverty. *Social Forces*, 75(1), 293–322.  
1373            <https://doi.org/10.1093/sf/75.1.293>
- 1374    Hussey, I., & Hughes, S. (2020). Hidden Invalidity Among 15 Commonly Used Measures in  
1375            Social and Personality Psychology. *Advances in Methods and Practices in Psychological*  
1376            *Science*, 3(2), 166-184. <https://doi.org/10.1177/2515245919882903>
- 1377    Hvidberg, K. B., Kreiner, C., & Stantcheva, S. (2020). *Social position and fairness views* (NBER  
1378            Working Paper No. w28099). National Bureau of Economic Research.  
1379            <https://www.nber.org/papers/w28099>

- 1380 Jost, J. T. (2017). Ideological asymmetries and the essence of political psychology. *Political*  
1381 *Psychology*, 38(2), 167–208. <https://doi.org/10.1111/pops.12407>
- 1382 Jost, J. T., Banaji, M. R., & Nosek, B. A. (2004). A decade of system justification theory:  
1383 Accumulated evidence of conscious and unconscious bolstering of the status quo.  
1384 *Political Psychology*, 25(6), 881–919. <https://doi.org/10.1111/j.1467-9221.2004.00402.x>
- 1385 Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions,  
1386 and elective affinities. *Annual Review of Psychology*, 60, 307–337.  
1387 <https://doi.org/10.1146/annurev.psych.60.110707.163600>
- 1388 Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as  
1389 motivated social cognition. *Psychological Bulletin*, 129(3), 339–375.  
1390 <https://doi.org/10.1037/0033-2909.129.3.339>
- 1391 Kay, A. C., & Jost, J. T. (2003). Complementary justice: Effects of “poor but happy” and “poor  
1392 but honest” stereotype exemplars on system justification and implicit activation of the  
1393 justice motive. *Journal of Personality and Social Psychology*, 85(5), 823–837.  
1394 <https://doi.org/10.1037/0022-3514.85.5.823>
- 1395 Kerr, W. R. (2014). Income inequality and social preferences for redistribution and  
1396 compensation differentials. *Journal of Monetary Economics*, 66, 62–78.  
1397 <https://doi.org/10.1016/j.jmoneco.2014.03.002>
- 1398 Kiatpongsan, S., & Norton, M. I. (2014). How much (more) should CEOs make? A universal  
1399 desire for more equal pay. *Perspectives on Psychological Science*, 9(6), 587–593.  
1400 <https://doi.org/10.1177/1745691614549773>

- 1401 Kidwell, B., Farmer, A., & Hardesty, D. M. (2013). Getting liberals and conservatives to go  
1402 green: Political ideology and congruent appeals. *Journal of Consumer Research*, *40*(2),  
1403 350–367. <https://doi.org/10.1086/670610>
- 1404 Kinder, D. R., & Kiewiet, D. R. (1979). Economic discontent and political behavior: The role of  
1405 personal grievances and collective economic judgments in congressional voting.  
1406 *American Journal of Political Science*, 495–527. <https://doi.org/10.2307/2111027>
- 1407 Kluegel, J. R., & Smith, E. R. (1986). *Beliefs about inequality: Americans' views of what is and*  
1408 *what ought to be*. Taylor & Francis.
- 1409 Konow, J. (1996). A positive theory of economic fairness. *Journal of Economic Behavior &*  
1410 *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)
- 1411 Konow, J. (2000). Fair shares: Accountability and cognitive dissonance in allocation decisions.  
1412 *American Economic Review*, *90*(4), 1072–1091. <https://doi.org/10.1257/aer.90.4.1072>
- 1413 Kraus, M. W., Rucker, J. M., & Richeson, J. A. (2017). Americans misperceive racial economic  
1414 equality. *Proceedings of the National Academy of Sciences*, *114*(39), 10324–10331.  
1415 <https://doi.org/10.1073/pnas.1707719114>
- 1416 Kraus, M. W., & Tan, J. J. (2015). Americans overestimate social class mobility. *Journal of*  
1417 *Experimental Social Psychology*, *58*, 101–111. <https://doi.org/10.1016/j.jesp.2015.01.005>
- 1418 Krawczyk, M. (2010). A glimpse through the veil of ignorance: Equality of opportunity and  
1419 support for redistribution. *Journal of Public Economics*, *94*(1–2), 131–141.  
1420 <https://doi.org/10.1016/j.jpubeco.2009.10.003>
- 1421 Kunovich, S., & Slomeczynski, K. M. (2007). Systems of distribution and a sense of equity: A  
1422 multilevel analysis of meritocratic attitudes in post-industrial societies. *European*  
1423 *Sociological Review*, *23*(5), 649–663. <https://doi.org/10.1093/esr/jcm026>

- 1424 Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest package: Tests in  
1425 linear mixed effects models. *Journal of Statistical Software*, 82(13), 1–26.  
1426 <https://doi.org/10.18637/jss.v082.i13>
- 1427 Lammers, J., & Baldwin, M. (2018). Past-focused temporal communication overcomes  
1428 conservatives' resistance to liberal political ideas. *Journal of Personality and Social*  
1429 *Psychology*, 114(4), 599–619. <https://doi.org/10.1037/pspi0000121>
- 1430 Lepianka, D., Van Oorschot, W., & Gelissen, J. (2009). Popular explanations of poverty: A  
1431 critical discussion of empirical research. *Journal of Social Policy*, 38(3), 421–438.  
1432 <https://doi.org/10.1017/s0047279409003092>
- 1433 Lewis-Beck, M. S., & Stegmaier, M. (2000). Economic determinants of electoral outcomes.  
1434 *Annual Review of Political Science*, 3(1), 183–219.  
1435 <https://doi.org/10.1146/annurev.polisci.3.1.183>
- 1436 Manstead, A. S. (2018). The psychology of social class: How socioeconomic status impacts  
1437 thought, feelings, and behaviour. *British Journal of Social Psychology*, 57(2), 267–291.  
1438 <https://doi.org/10.1111/bjso.12251>
- 1439 McCall, L., Burk, D., Laperrière, M., & Richeson, J. A. (2017). Exposure to rising inequality  
1440 shapes Americans' opportunity beliefs and policy support. *Proceedings of the National*  
1441 *Academy of Sciences*, 114(36), 9593–9598. <https://doi.org/10.1073/pnas.1706253114>
- 1442 McCrae, R. R. (1996). Social consequences of experiential openness. *Psychological Bulletin*,  
1443 120(3), 323–337. <https://doi.org/10.1037/0033-2909.120.3.323>
- 1444 Meltzer, A. H., & Richard, S. F. (1981). A rational theory of the size of government. *Journal of*  
1445 *Political Economy*, 89(5), 914–927. <https://doi.org/10.1086/261013>

- 1446 Mijs, J. J. (2018). Inequality is a problem of inference: How people solve the social puzzle of  
1447 unequal outcomes. *Societies*, 8(3), 64. <https://doi.org/10.3390/soc8030064>
- 1448 Mijs, J. J. (2019). The paradox of inequality: income inequality and belief in meritocracy go  
1449 hand in hand. *Socio-Economic Review*, 39, <https://doi.org/10.1093/ser/mwy051>
- 1450 Norton, M. I., & Ariely, D. (2011). Building a better America—one wealth quintile at a time.  
1451 *Perspectives on Psychological Science*, 6(1), 9–12.  
1452 <https://doi.org/10.1177/1745691610393524>
- 1453 Norton, M. I., Neal, D. T., Govan, C. L., Ariely, D., & Holland, E. (2014). The not-so-common-  
1454 wealth of Australia: Evidence for a cross-cultural desire for a more equal distribution of  
1455 wealth. *Analyses of Social Issues and Public Policy*, 14(1), 339–351.  
1456 <https://doi.org/10.1111/asap.12058>
- 1457 Osberg, L., & Smeeding, T. (2006). “Fair” inequality? Attitudes toward pay differentials: The  
1458 United States in comparative perspective. *American Sociological Review*, 71(3), 450–  
1459 473. <https://doi.org/10.1177/000312240607100305>
- 1460 Oxoby, R. J., & Spraggon, J. (2008). Mine and yours: Property rights in dictator games. *Journal*  
1461 *of Economic Behavior & Organization*, 65(3–4), 703–713.  
1462 <https://doi.org/10.1016/j.jebo.2005.12.006>
- 1463 PEW. (2018). 2018 midterm voters: Issues and political values. Retrieved from  
1464 [https://www.people-press.org/2018/10/04/2018-midterm-voters-issues-and-political-](https://www.people-press.org/2018/10/04/2018-midterm-voters-issues-and-political-values)  
1465 [values.](https://www.people-press.org/2018/10/04/2018-midterm-voters-issues-and-political-values)
- 1466 Piff, P. K., Kraus, M. W., & Keltner, D. (2018). Unpacking the inequality paradox: The  
1467 psychological roots of inequality and social class. In J. Olson (Ed.), *Advances in*

- 1468            *experimental social psychology* (Vol. 57, pp. 53–124). Academic Press.
- 1469            <https://doi.org/10.1016/bs.aesp.2017.10.002>
- 1470 Piff, P. K., Wiwad, D., Robinson, A. R., Aknin, L. B., Mercier, B., & Shariff, A. (2020). Shifting  
1471            attributions for poverty motivates opposition to inequality and enhances egalitarianism.  
1472            *Nature Human Behaviour*, 4(5), 496–505. <https://doi.org/10.1038/s41562-020-0835-8>
- 1473            Piketty, T. (1995). Social mobility and redistributive politics. *The Quarterly Journal of*  
1474            *Economics*, 110(3), 551–584. <https://doi.org/10.230/2946692>
- 1475            Piketty, T., & Saez, E. (2014). Inequality in the long run. *Science*, 344(6186), 838–843.  
1476            <https://doi.org/10.1126/science.1251936>
- 1477            Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A  
1478            personality variable predicting social and political attitudes. *Journal of Personality and*  
1479            *Social Psychology*, 67(4), 741–763. <https://doi.org/10.1037/0022-3514.67.4.741>
- 1480            Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting:  
1481            The state of the art and future directions for psychological research. *Developmental*  
1482            *Review*, 41, 71–90. <https://doi.org/10.1016/j.dr.2016.06.004>
- 1483            R Core Team. (2018). R: A language and environment for statistical computing. Vienna, Austria:  
1484            R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- 1485            Reeskens, T., & Van Oorschot, W. (2013). Equity, equality, or need? A study of popular  
1486            preferences for welfare redistribution principles across 24 European countries. *Journal of*  
1487            *European Public Policy*, 20(8), 1174–1195.  
1488            <https://doi.org/10.1080/13501763.2012.752064>

- 1489 Reyna, C., Tucker, A., Korfmacher, W., & Henry, P. (2005). Searching for common ground  
1490 between supporters and opponents of affirmative action. *Political Psychology*, 26(5),  
1491 667–682. <https://doi.org/10.1111/j.1467-9221.2005.00438.x>
- 1492 Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical*  
1493 *Software*, 48(2), 1–36. Retrieved from <http://www.jstatsoft.org/v48/i02/>
- 1494 Saez, E., & Zucman, G. (2016). Wealth inequality in the United States since 1913: Evidence  
1495 from capitalized income tax data. *The Quarterly Journal of Economics*, 131(2), 519–578.  
1496 <https://doi.org/10.1093/qje/qjw004>
- 1497 Sahar, G. (2014). On the importance of attribution theory in political psychology. *Social and*  
1498 *Personality Psychology Compass*, 8(5), 229–249. <https://doi.org/10.1111/spc3.12102>
- 1499 Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from  
1500 neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the life  
1501 orientation test. *Journal of Personality and Social Psychology*, 67(6), 1063–1078.  
1502 <https://doi.org/10.1037/0022-3514.67.6.1063>
- 1503 Schwabish, J. A., Smeeding, T. M., & Osberg, L. (2006). Income distribution and social  
1504 expenditures. In D. Papadimitriou (Ed.), *The distributional effects of government*  
1505 *spending and taxation* (pp. 247–288). Palgrave Macmillan.  
1506 [https://doi.org/10.1057/9780230378605\\_9](https://doi.org/10.1057/9780230378605_9)
- 1507 Shariff, A. F., Wiwad, D., & Aknin, L. B. (2016). Income mobility breeds tolerance for income  
1508 inequality: Cross-national and experimental evidence. *Perspectives on Psychological*  
1509 *Science*, 11(3), 373–380. <https://doi.org/10.1177/1745691616635596>
- 1510 Sides, J., Tesler, M., & Vavreck, L. (2017). The 2016 US election: How Trump lost and won.  
1511 *Journal of Democracy*, 28(2), 34–44. <https://doi.org/10.1353/jod.2017.0022>

- 1512 Simms, L. J. (2008). Classical and modern methods of psychological scale construction. *Social*  
1513 *and Personality Psychology Compass*, 2(1), 414–433. <https://doi.org/10.1111/j.1751->  
1514 [9004.2007.00044.x](https://doi.org/10.1111/j.1751-9004.2007.00044.x)
- 1515 Starman, C., Sheskin, M., & Bloom, P. (2017). Why people prefer unequal societies. *Nature*  
1516 *Human Behaviour*, 1(4), 0082. <https://doi.org/10.1038/s41562-017-0082>
- 1517 Tannenbaum, D., Fox, C. R., & Ülkümen, G. (2016). Judgment extremity and accuracy under  
1518 epistemic vs. Aleatory uncertainty. *Management Science*, 63(2), 497–518.  
1519 <https://doi.org/10.1287/mnsc.2015.2344>
- 1520 Trump, K. S. (2018). Income inequality influences perceptions of legitimate income differences.  
1521 *British Journal of Political Science*, 48(4), 929–952.  
1522 <https://doi.org/10.1017/s0007123416000326>
- 1523 Trump, K. S. (2020). When and why is economic inequality seen as fair. *Current Opinion in*  
1524 *Behavioral Sciences*, 34, 46–51. <https://doi.org/10.1016/j.cobeha.2019.12.001>
- 1525 Trump, K. S., & White, A. (2018). Does inequality beget inequality? Experimental tests of the  
1526 prediction that inequality increases system justification motivation. *Journal of*  
1527 *Experimental Political Science*, 5(3), 206–216. <https://doi.org/10.1017/xps.2018.2>
- 1528 Tyler, T. (2011). Procedural justice shapes evaluations of income inequality: Commentary on  
1529 Norton and Ariely (2011). *Perspectives on Psychological Science*, 6(1), 15–16.  
1530 <https://doi.org/10.1177/1745691610393981>
- 1531 Ülkümen, G., Fox, C. R., & Malle, B. F. (2016). Two dimensions of subjective uncertainty:  
1532 Clues from natural language. *Journal of Experimental Psychology: General*, 145(10),  
1533 1280–1297. <https://doi.org/10.1037/xge0000202>



- 1534 Vavreck, L. (2014). Want a better forecast? Measure the campaign not just the economy. *PS:*  
1535 *Political Science & Politics*, 47(2), 345–347.  
1536 <https://doi.org/10.1017/s1049096514000183>
- 1537 Voelkel, J. G., & Feinberg, M. (2018). Morally reframed arguments can affect support for  
1538 political candidates. *Social Psychological and Personality Science*, 9(8), 917–924.  
1539 <https://doi.org/10.1177/1948550617729408>
- 1540 Voelkel, J. G., Mernyk, J. S., & Willer, R. (2020). Resolving the progressive paradox: The  
1541 effects of moral reframing on support for economically progressive candidates. Retrieved  
1542 from [10.31234/osf.io/mtfjn](https://osf.io/mtfjn)
- 1543 Walters, D. J., Ülkümen, G., Tannenbaum, D., Erner, C., & Fox, C. R. (2021). Investor behavior  
1544 under epistemic versus aleatory uncertainty. Working paper, INSEAD.
- 1545 Weiner, B., Osborne, D., & Rudolph, U. (2011). An attributional analysis of reactions to poverty:  
1546 The political ideology of the giver and the perceived morality of the receiver. *Personality*  
1547 *and Social Psychology Review*, 15(2), 199–213.  
1548 <https://doi.org/10.1177/1088868310387615>
- 1549 Weisenthal, J. (2013). We Love What Warren Buffett Says About Life, Luck, And Winning The  
1550 'Ovarian Lottery'. Retrieved from [https://www.businessinsider.com/warren-buffett-on-](https://www.businessinsider.com/warren-buffett-on-the-ovarian-lottery-2013-12?international=true&r=US&IR=T)  
1551 [the-ovarian-lottery-2013-12?international=true&r=US&IR=T](https://www.businessinsider.com/warren-buffett-on-the-ovarian-lottery-2013-12?international=true&r=US&IR=T)
- 1552 Wilson, M. S., & Sibley, C. G. (2013). Social dominance orientation and right-wing  
1553 authoritarianism: Additive and interactive effects on political conservatism. *Political*  
1554 *Psychology*, 34(2), 277–284. <https://doi.org/10.1111/j.1467-9221.2012.00929.x>

- 1555 Wiwad, D., Mercier, B., Piff, P. K., Shariff, A., & Aknin, L. B. (2021). Recognizing the impact  
1556 of Covid-19 on the poor alters attitudes towards poverty and inequality. *Journal of*  
1557 *Experimental Social Psychology*, *93*, 104083. <https://doi.org/10.1016/j.jesp.2020.104083>
- 1558 Wolsko, C., Ariceaga, H., & Seiden, J. (2016). Red, white, and blue enough to be green: Effects  
1559 of moral framing on climate change attitudes and conservation behaviors. *Journal of*  
1560 *Experimental Social Psychology*, *65*, 7–19. <https://doi.org/10.1016/j.jesp.2016.02.005>
- 1561 WVS. (n.d.). World values survey wave 3 (1995–1998).  
1562 <http://www.worldvaluessurvey.org/WVSDocumentationWV3.jsp>.
- 1563 Zucker, G. S., & Weiner, B. (1993). Conservatism and perceptions of poverty: An attributional  
1564 analysis. *Journal of Applied Social Psychology*, *23*(12), 925–943.  
1565 <https://doi.org/10.1111/j.1559-1816.1993.tb01014.x>
- 1566 Zucman, G. (2019). Global wealth inequality. *Annual Review of Economics*, *11*(1), 109–183.  
1567 <https://doi.org/10.1146/annurev-economics-080218-025852>