Decisions under financial scarcity

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Chapter 5

Financial scarcity and perceived control across societies

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Financial Scarcity and Perceived Control across Societies

A basic human need is to feel in control over one's life (Landau et al., 2015; Rothbaum et al., 1982). Such control is defined as the perceived ability to determine one's states and behaviors, achieve desired outcomes, and prevent undesired outcomes (Landau et al., 2015; Wallston et al., 1987). Maintaining control is highly consequential: It induces positive affect (Helzer & Jayawickreme, 2015), facilitates goal pursuit (Bhanji et al., 2015; Heckhausen et al., 2010), and increases mental and physical health (Greenaway et al., 2015; Heckhausen et al., 2010). Lacking control is aversive and stressful (Landau et al., 2015), and relates to depression and anxiety (Jonas et al., 2014; Ross & Mirowsky, 2013). Previous cross-cultural research has shown that humans desire and experience control similarly across the globe (Hornsey et al., 2019; Noordewier et al., 2023).[27] Yet, worldwide, people face a variety of threats to control. One such threat might be financial scarcity (Fritsche & Jugert, 2017), which is the subjective experience of lacking financial resources to meet demands (Mullainathan & Shafir, 2013; Shah et al., 2012). Following this, we investigated the existence, prevalence, and cross-societal variation of the association between financial scarcity and control across 51 societies (N = 12,779).

Financial Scarcity and Control

Experiencing financial scarcity is stressful (Haushofer & Fehr, 2014; Jachimowicz et al., 2022; Van Dijk et al., 2022) and induces negative emotions like worry and shame (De Bruijn & Antonides, 2020; Walker et al., 2013). Moreover, financial scarcity affects how people allocate their attention (Shah et al., 2012, 2015).[28] For example, it draws attention towards pressing financial concerns, which induces a short-term focus (Carvalho et al., 2016; Haushofer & Fehr, 2014; Hilbert et al., 2022a; Ruggeri et al., 2022). At the same time, financial scarcity is associated with avoidance of one's finances (Hilbert et al., 2022b), increases the likelihood to engage in unethical economic behavior (Elbaek et al., 2021) and might negatively affect cognitive functioning (Huijsmans et al., 2019; Mani et al., 2013; but see Wicherts & Scholten 2013).[29]

Here, we hypothesized that (H1) across the globe, financial scarcity is negatively associated with perceived control over one's life. Lacking needed financial resources might impede the ability to effectively attain desired life outcomes or prevent undesired ones (Fritsche & Jugert, 2017), which is the central for the belief that life is under control (Landau et al., 2015; Wallston et al., 1987). Thus, we propose that financial scarcity entails a perceived lack of control over one's financial situation (see also Van Dijk et al., 2022), which can generalize to a perceived lack of control over one's life (Fritsche & Jugert, 2017). In line with this reasoning, a longitudinal study using Swiss panel data showed that over time, financial scarcity was associated with reduced self-mastery, a subcategory of perceived control

[27] With the exception of lower levels of perceived and desired control in Japan.
[28] For replication attempts, see Camerer et al. (2018), O'Donnell et al. (2021), and Shah et al. (2019)
[29] Evidence for the latter effect is mixed (e.g., Carvalho et al., 2016; for an overview, see De Bruijn & Antonides 2021)

(Sommet & Spini, 2022).[30] Similarly, a diary study in the United States showed that after receiving income (i.e., a reduction of financial scarcity), participants experienced more control over their lives (Jachimowicz et al., 2022).[31] While these studies provide valuable evidence for the relevance of financial scarcity for perceived control, they were conducted exclusively with WEIRD samples (White, Educated, Industrialized, Rich, Democratic; Henrich et al., 2010). Given that financial scarcity and need for control are global phenomena, it is crucial to investigate whether this association is indeed ubiquitous or varies across the globe.

Societal Buffers to Control Threats

Even though control threats and needs have been shown to exist relatively similarly across the globe, we predict that their association might vary across societies. Societies differ on various economic, cultural, and social qualities, which might serve as compensation sources against the control threat of financial scarcity. Much research has been conducted on how people try to restore a threatened sense of control (for an overview, see Landau et al., 2015). It has been shown that a threat to personal control—like lacking needed financial resources—can be compensated by a stronger reliance on secondary sources of control (Kay et al., 2009; Landau et al., 2015). For example, when feeling unable to achieve goals through own means, people might justify and rely more on the government and institutions or put faith into a controlling god (Kay et al., 2008, 2010; Rothbaum et al., 1982). Thus, societal differences in the prevalence and availability of these qualities might shape the association between financial scarcity and control.

Therefore, we propose that several societal qualities might buffer against the control threat of financial scarcity. First, *welfare provisions*—the social and monetary services provided by a society to benefit its citizens—might protect people who experience financial scarcity from the feeling that life is slipping out of control. This is supported by prior research that has shown that welfare provisions can attenuate negative psychological and economic consequences of financial deprivation by reducing the risk that financial problems deteriorate into an existential threat (Attah et al., 2016; Israel, 2016). Second, higher *quality of institutions*—describing the effectiveness and efficiency of institutions and processes by which authority is exercised and controlled in a society—might restore some threatened sense of control by increasing trust in governance and perceptions of order and safety (Chong & Calderon, 2000; Kay et al., 2008, 2010). In line with this, according to the material security hypothesis, efficient societal institutions can satisfy basic needs and mitigate threats related to environmental and resource insecurity (Hruschka et al., 2014; Hruschka & Henrich, 2013). Third, better *labor conditions*—citizens equal access to work opportunities, good working conditions, and fair wages—might protect people with little financial resources from feeling a lack of control over their life and more severe economic, health, and psychological consequences of exploitation (Muntaner et al., 2010).

[30] This paper also reports findings from a cross-societal study showing a negative association between financial scarcity and mental health. Yet, the cross-societal study did not examine the role of perceived control.
[31] Subsequently, participants also felt less distressed and reported higher life satisfaction.

Taken together, we hypothesized (H2a–c) that in societies with higher welfare provisions, higher quality of institutions, and better labor conditions, the negative association between financial scarcity and perceived control would be weaker. Importantly, all three of these societal qualities vary considerably across the globe (Coppedge et al., 2022; Freedom House, 2020; the Economist Intelligence Unit, 2020; World Bank, 2023; World Economic Forum, 2020), suggesting that there might be considerable heterogeneity in the association between financial scarcity and perceived control across societies.

Method

The study was approved by the Psychology Research Ethics Committee of Leiden University (The Netherlands), application number: 2020-02-03-A.Romano-V1-2068. All participants provided informed consent. All data, analysis codes, and materials are openly available at the Open Science Framework (OSF; https://doi.org/10.17605/OSF.IO/UPAJ3).

Participants and Data Collection

Participants were recruited through the Toluna Panel and its third-party panel providers from December 2020 to February 2021. Our goal was to recruit 12,750 participants across 51 societies (approximately 250 per society, stratified by age and gender). Of the 12,863 participants that completed the study, 84 had incomplete data and were excluded from all analyses, leading to a final sample of 12,779 participants.[32] Sample descriptives per society are displayed in the Appendix A, Table 1. We collected data from the following 51 societies (Figure 1): Algeria, Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Czech Republic, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Kenya, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Peru, Poland, Portugal, Romania, Russian Federation, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, United Arab Emirates, United Kingdom, United States, and Vietnam.

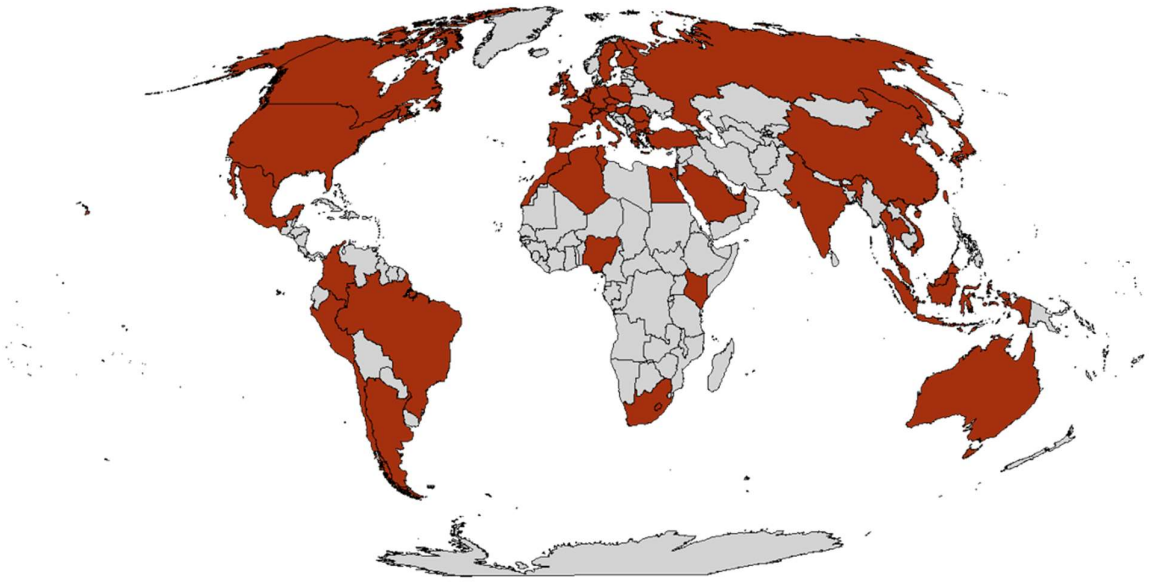
Preregistration

We preregistered the study setup, hypotheses, measures, and analysis plan prior to data collection on the OSF (https://doi.org/10.17605/OSF.IO/6KTHF). Before linking our own data with the data for the societal indicators, we updated the preregistration to specify the cross-societal hypotheses 2a–c and respective analyses plan, and dropped the secondary analyses on the items assessing the endorsement of compensatory control sources. We deviated from the final preregistered analysis plan in the following way: To extract components for the societal indicator of "labor conditions", we had planned to include the indicators *Collective Bargaining Coverage Rate* and *Compliance with Labor Rights* from the International Labor Organization (ILO). However, these indicators contained missing data for

[32] For participants that dropped out of the study or that failed all attention checks, new participants were recruited by the panel provider until the target sample size was met. The total number of recruited participants was 16,659.

many of the societies in our study (18 *NA* and 19 *NA*, respectively), which would have resulted in a loss of approximately 35% of data, too many to reliably impute.

Figure 1
World Map Displaying Societies Included in the Study in Red



Procedure

Participants first conducted a behavioral experiment unrelated to our project (see Romano et al., 2022). Then, participants responded to a number of questionnaires: First, participants responded to the single item measure on perceived control and then completed the Psychological Inventory of Financial Scarcity (Van Dijk et al., 2022). Thereafter, participants responded to several items unrelated to this project and gave their demographic information.

Measures

Perceived Control

Participants filled in a single-item measure for perceived control as used in the World Values Survey (Haerpfer et al., 2020). The item was introduced as follows: "This questionnaire is about control. Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them." Then, on a seven-point Likert-scale ranging from 1 = *totally disagree* to 7 = *totally agree*, participants were asked to indicate their agreement with the statement "I have control over my life". Histograms for perceived control scores in each society are displayed in Appendix A, Figure 1a. For all analyses, perceived control scores were z-standardized within societies.

Psychological Inventory of Financial Scarcity (PIFS)

Participants filled in a short version of the PIFS (Van Dijk et al., 2022), which consists of five items measured on a seven-point Likert-scale, ranging from 1 = *totally disagree* to 7 = *totally agree*. The five items were: "I often don't have enough money", "I am constantly wondering whether I have enough money", "I worry about money a lot", "I am only focusing on what I have to pay at this moment, rather than my future expenses", and "I experience little control over my financial situation".[33] Reliability analyses based on multilevel confirmatory factor analysis (mCFA) using the *multilevelTools* package in *R* (Geldhof et al., 2014) revealed that the scale was reliable within societies, ω_{within} = .84, 95%CI [.84, .85], and between societies, $\omega_{between}$ = .95, 95%CI [.92, .97]. Histograms for PIFS scores in each society are displayed in Appendix A, Figure 1b.[34] For all analyses, PIFS scores were z-standardized within societies.

Cross-Societal Indicators

To test our preregistered interaction hypotheses, we combined our dataset with several societal level indicators from openly available datasets. We selected data for the indicators from the same time period of our data collection. If these were not available, the closest available time point was used. To increase the reliability and generalizability of our analyses, we selected multiple indicators for each of the concepts below and conducted principal component analyses to extract components representing each of the concepts (see Appendix B). We extracted a number of components that explained at least 80% in the total variance for all indicators. To keep data loss at a minimum, we imputed missing data based on "leave one out" cross-validation using the *missMDA* package in *R* (Josse & Husson, 2016). The number of missing cases for each indicator was low (≤ 6), suggesting that imputation was appropriate.

Welfare Provisions. As indicators for welfare provisions, we used the *Social Safety Net Expenditure by GDP* measure from the ASPIRE dataset of the World Bank (2023a) and the *Social Protection* indicator from the Global Social Mobility Index of the World Economic Forum (2020). The two indicators correlated with r = .86. Principal component analyses revealed a single component that explained 92.6% of the total variance. We extracted and z-standardized societies scores on this component for our analyses, with higher scores indicating more welfare provisions.

Quality of Institutions. As indicators for the quality of institutions, we used the six *Worldwide Governance Indicators* of the World Bank (2022; i.e., Voice and Accountability, Regulatory Quality, Political Stability and Absence of Violence/Terrorism, Rule of Law, Government Effectiveness, and Control of Corruption), the *Liberal Component Index* of the Varieties of Democracies Institute (Coppedge et al., 2022; Pemstein et al., 2022), the *Efficient and Inclusive Institutions* indicator from the Global Social

[33] Given that the last item is conceptually related to the dependent measure on perceived control over one's life, we ran robustness checks with this item removed. Results did not differ in direction or magnitude (see supplementary material).
[34] For more analyses on the PIFS in this dataset, including measurement invariance tests, see (Gallucci et al., 2023)

Mobility Index of the World Economic Forum (2020), the *Rule of Law* indicator of Freedom House (2023), and the *Functioning of Government* indicator from the Democracy Index of the Economist Intelligence Unit (2020). Principal component analyses revealed a single component that explained 80.1% of the total variance. We extracted and z-standardized societies scores on this component for our analyses, with higher scores indicating higher quality of institutions.

Labor Conditions. As indicators for labor conditions, we used the three indicators *Work Opportunities*, *Fair Wages*, and *Working Conditions* from the Global Social Mobility Index of the World Economic Forum (2020). Principal component analyses revealed a solution of two orthogonal components, the first one representing labor conditions as a whole and explaining 69.3 % of the total variance, and the second one representing mainly work opportunities and explaining 21.0 % of the total variance. We extracted and z-standardized societies scores on both component for our analyses, with higher scores indicating better labor conditions and work opportunities, respectively.

Results

Cross-Societal Variation in Perceived Control

A random intercept model with societies explained R^2 = .049 of the total variance in perceived control, indicating that people experience control relatively similar across the globe (i.e., ICC < .10, see Byrne & Van de Vijver, 2014). Yet, simulation-based exact tests conducted with the *RLRsim* package (Scheipl et al., 2008) indicated that random effects for societies explained a significant amount of variance in the random intercept model (RLRT = 488.76, p < .001), suggesting that mixed model analyses were appropriate.

Confirmatory Analyses

Fixed Effect of Financial Scarcity

Results for the preregistered hypotheses tests are displayed in Table 1. Data showed support for our hypothesis that across societies, financial scarcity is associated with lower perceived control over one's life (Model 1). A mixed model with random intercepts for societies and controlling for age, gender, and education showed a negative effect of financial scarcity on perceived control, β = -.24, 95%CI [-.26, -.22], p < .001. The fixed effect of financial scarcity explained an additional R^2 = .028 of the total variance in perceived control, 95%CI [.022, .034], as estimated with the *partR2* package using 1000 bootstrap samples (Stoffel et al., 2021). This finding suggests that across the globe, people who experience financial scarcity are more likely to perceive lower control over their lives.

Table 1

Model Summaries for Preregistered Hypotheses Tests

	Model 1				Model 2				Model 3				Model 4			
		95% CI				95% CI				95% CI				95% CI		
	Est	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Predictors																
Intercept	5.27	5.18	5.36	**< .001**	5.27	5.19	5.35	**< .001**	5.27	5.19	5.35	**< .001**	5.27	5.19	5.35	**< .001**
Financial scarcity	-0.24	-0.26	-0.22	**< .001**	-0.24	-0.27	-0.22	**< .001**	-0.24	-0.26	-0.21	**< .001**	-0.24	-0.26	-0.22	**< .001**
Education	0.04	0.02	0.07	**< .001**	0.04	0.02	0.07	**.001**	0.04	0.02	0.07	**< .001**	0.04	0.02	0.07	**.001**
Age	0.02	-0.01	0.04	.170	0.02	-0.01	0.04	.213	0.01	-0.01	0.04	.308	0.01	-0.01	0.04	.249
Gender	-0.01	-0.06	0.04	.652	-0.01	-0.06	0.04	.769	-0.01	-0.06	0.04	.631	-0.01	-0.06	0.04	.739
Welfare					-0.18	-0.25	-0.10	**< .001**								
Scarcity x Welfare					-0.09	-0.11	-0.07	**< .001**								
Institutions									-0.16	-0.24	-0.08	**< .001**				
Scarcity x Institutions									-0.10	-0.12	-0.08	**< .001**				
Labor conditions													-0.12	-0.20	-0.04	**.003**
Work opportunities													0.12	0.05	0.20	**.002**
Scarcity x Labor conditions													-0.09	-0.11	-0.06	**< .001**
Scarcity x Work opportunities													0.01	-0.01	0.03	.435
Random Effects																
Random effects variance (σ^2)	1.86				1.85				1.85				1.85			
Random intercept variance (τ_{00})	0.10				0.07				0.08				0.07			
ICC	0.05				0.04				0.04				0.04			
Marg. R^2 / Cond. R^2	0.031 / 0.080				0.050 / 0.085				0.048 / 0.086				0.049 / 0.085			

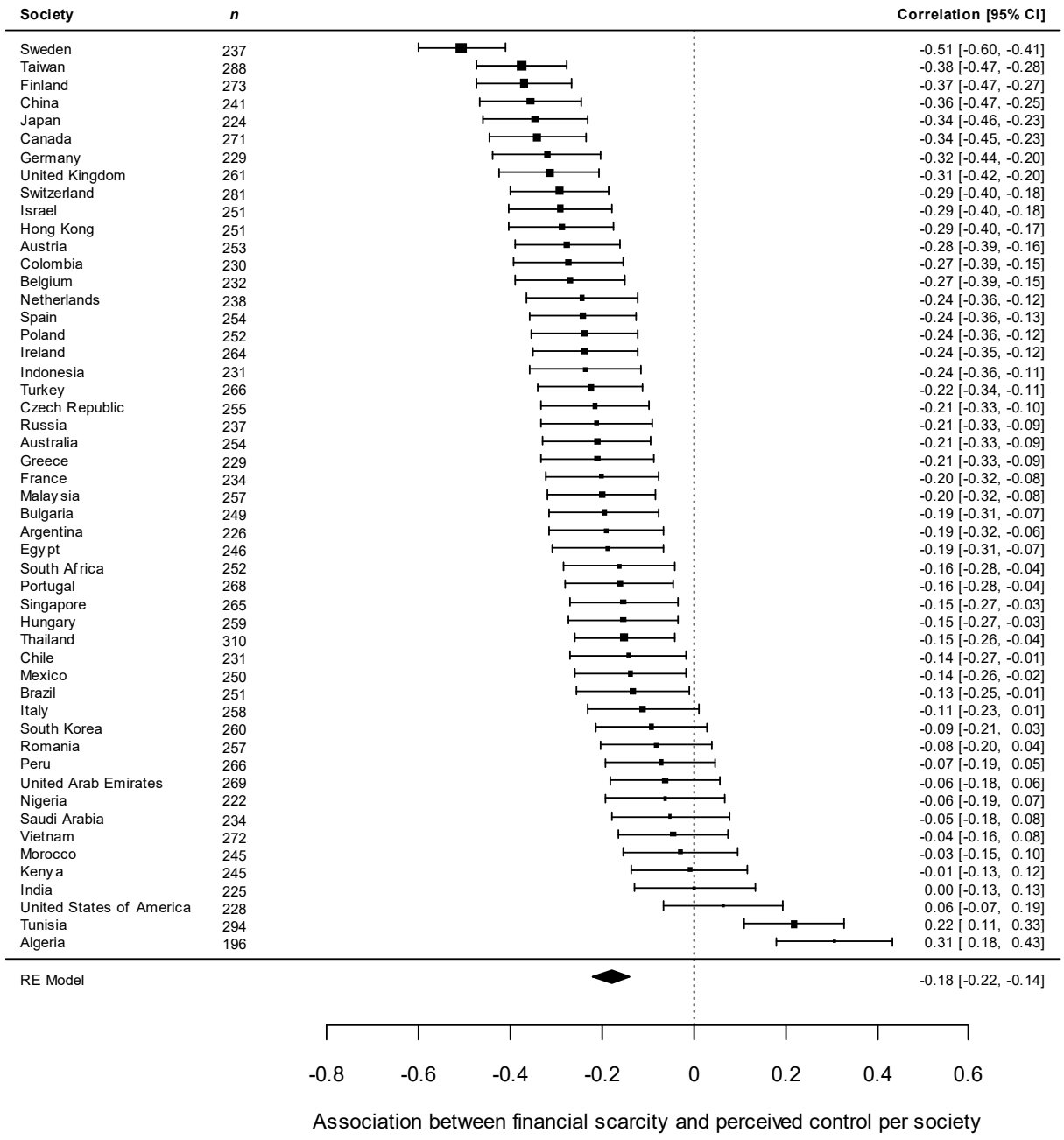
Note. Results for preregistered mixed models predicting perceived control. Models include random intercepts for societies, are based on i = 12779 observations clustered in n = 51 societies. The predictors financial scarcity, education, and age were measured on the individual level and z-standardized within each society. The societal indicators welfare, institutions, labor conditions, and work opportunities were measured on the societal level. Bold p-values are statistically significant. Est = estimates, LL = lower limit, UL = upper limit.

Meta-Analysis

We conducted a meta-analysis to estimate the heterogeneity of the association between financial scarcity and perceived control across societies. In line with results of the mixed model, the meta-analysis showed a moderate association between financial scarcity and perceived control across societies, r = -.18, SE = .02, 95% CI [-.22, -.14], z = -8.86, p < .001. Moreover, there was strong heterogeneity in effect sizes between societies, τ^2 = .017, SE = .004, Q(50) = 303.5, p < .001. Of the total variance in effect sizes, 82.9 % could be attributed to heterogeneity between societies. This indicates that societies explained H^2 = 5.85 times more variance than could be expected by random error. Figure 2 shows the correlation between financial scarcity and perceived control per society, displaying the strong cross-societal variation. Correlations ranged from -.51 to .31, indicating that financial scarcity was strongly negatively associated with perceived control in some societies (explaining up to 25% of the total variance) and moderately positively associated with perceived control in others (explaining up to 9.6% of the total variance). Overall, the association between scarcity and perceived control was negative for 37 societies in our sample, not significantly different from zero in 12 societies, and positive in 2 societies. Thus, while the study provides evidence in support of our hypothesis that financial scarcity is negatively associated with perceived control, this association might not be ubiquitous across the globe.

Figure 2

Forest Plot showing the Meta-Analytic Results for the Association between Financial Scarcity and Control



Note. The forest plot displays the meta-analytic effect sizes for financial scarcity on perceived control per society. For each society, we report the Pearson correlation coefficient (*r*) and its 95% confidence interval. The size of the square indicates the relative weight the societal estimates for the overall effect size. The diamond displays the overall effect size is for the random effects (RE) model. *n* = sample size for each society.

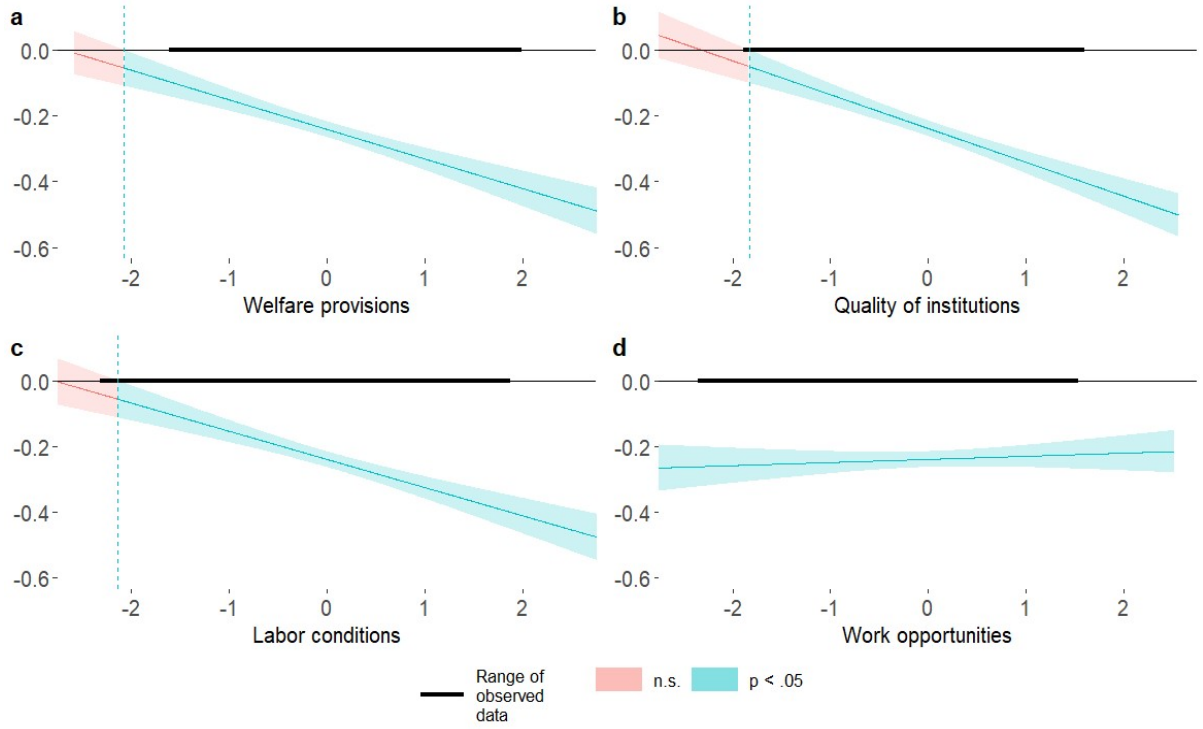
Cross-Level Interactions with Societal Indicators

Next, we tested our preregistered hypotheses that several societal level indicators might covary with the observed heterogeneity in effect sizes between countries and moderate the association between financial scarcity and perceived control. Results revealed interaction effects between financial scarcity and each of the components for welfare provisions (β = -.09, $p < .001$), quality of institutions (β = -.10, $p < .001$), and labor conditions (β = -.09, $p < .001$), but not for work opportunities (β = .01, $p = .435$; Figures 3a–d; Table 1, Models 2–4). However, these effects were in the opposite direction to our preregistered hypotheses. The negative association between financial scarcity and perceived control was weaker for societies with lower—not higher—welfare provisions, quality of institutions, and labor conditions.

In addition to the interaction terms, the main effects for the three indicators were also significant. Regardless of their financial situation, participants experienced more control over their lives in societies with lower welfare provisions, lower quality of institutions, and worse labor conditions. As evident in Table 1, including the fixed effects for the societal indicators and their cross-level interaction with financial scarcity in the model increased the variance explained by fixed effects by an additional $R^2_{\text{marginal}} \approx .02$. This increase in explained (marginal) variance constituted approximately 40% of the total variance explained by societies in the random intercept model (see above). Thus, a substantial part of the heterogeneity between societies in perceived control covaried with the societal qualities included in our preregistered models. Thus, contrary to our hypotheses, experiencing financial scarcity in societies that score lower—not higher—on these indicators was associated less with reduced sense of control over one's life.

Figure 3

Johnson-Neyman Plots Showing the Slopes for Financial Scarcity on Control for the Different Levels of the Societal Indicators



Note. Figure 3a shows that at lower levels of welfare provisions, the negative association between financial scarcity and perceived control becomes weaker. Figures 3b and 3c show similar results for quality of institutions and labor conditions, respectively, with the association being non-significantly different from zero for the lowest scoring societies. Figure 3d does not provide evidence for a similar effect for the interaction of financial scarcity and work opportunities.

Robustness Checks

We conducted several analyses to test whether the findings of our preregistered analyses were robust (Appendix C, Tables 2–5). First, we included random slopes for societies in the models. Second, we ran the analyses without control variables. Third, we excluded an item from the PIFS on perceived financial control, which shows some conceptual overlap with our dependent variable. Fourth, we excluded societies from the analyses which showed extreme values for the association between financial scarcity and control. Fifth, we added the societal indicators from the exploratory analyses (see below) and their interaction terms with financial scarcity as covariates to the analyses. Sixth, we added societal means for financial scarcity as a control variable to the analyses. Seventh, we added the individual level variables from the exploratory analyses (see below) and their interaction terms with financial scarcity as covariates to our analyses. Eighth, we added control variables for the impact of the COVID-19 pandemic to the analyses. For all robustness checks, the direction and significance of our original findings did not change. When controlling for the impact of the COVID-19 pandemic, the fixed effect for financial scarcity was stronger than in our preregistered analyses.

Exploratory Analyses

As with any correlational design, it is possible that hidden variables not included in our analyses explain these contradicting findings. Moreover, even if the influence of these variables is statistically controlled for, measurement error might prevent effective control of hidden variables influencing the observed association (Wysocki et al., 2022). Therefore, we explored potential alternative moderation models.

As a follow up, we explored whether other societal indicators might also covary with the strong heterogeneity in effect sizes across societies. Therefore, we first conducted a literature search and identified four additional societal indicators that might also moderate the association between financial scarcity and perceived control (i.e., economic development, economic inequality, secular vs. traditional values, and individualistic vs. collectivistic values). In addition, we tested whether two individual level variables from our dataset might also function as moderators in alternative models (i.e., religiosity and family support). Regression tables for all exploratory analyses and a correlation table of all societal level indicators can be found in Appendix D. We report all exploratory analyses that were conducted and use a Bonferroni correction for the alpha level based on six additional analyses ($\alpha = .008$).

First, we checked whether the association between financial scarcity and perceived control is weaker in societies characterized by relatively lower wealth. It is possible that having little financial resources in these societies does not constitute such strong threat to one's sense of control because it entails fewer negative social comparisons (Kley, 2022). To test this, we included GDP per capita (The World Bank, 2023b) as a measure for economic development in our analyses. In line with this reasoning, the negative association between financial scarcity and control was weaker in societies with lower GDP per capita ($\beta = -.08$, $p < .001$). Thus, in economically less developed societies, financial scarcity was associated less with a perceived lack of control over one's life.

Second, based on a similar reasoning, we also tested whether the association between financial scarcity and perceived control might be dependent on economic inequality within a society. As with economic development, it is possible that in economically equal societies, the experience of financial scarcity results in a higher prevalence of negative social comparisons (Kley et al., 2022). To test this, we used the gini coefficient (The World Bank, 2023c) as a measure for economic inequality in our analyses. However, results did not provide evidence in support of this alternative moderation model. The association between financial scarcity and perceived control did not differ based on gini scores ($\beta = .02$, $p = .216$). Thus, there was no evidence suggesting that the association between financial scarcity and control is weaker in more unequal societies.

Third, we explored whether differences in cultural values might covary with the heterogeneity in the association between financial scarcity and perceived control. One of the most prominent cultural dimensions differentiates between individualistic and collectivistic values (Hofstede, 2011). As suggested by Jachimowicz et al (2022), it is possible that the negative association between financial scarcity and perceived control is weaker in collectivistic societies compared to individualistic societies,

as stronger social bonds in collectivistic societies might buffer against negative effects of financial scarcity (Mikucka, 2013). Compensatory control theory posits a similar reasoning: Identifying more closely with others can restore control perceptions when personal control is threatened (Rothbaum et al., 1982). To test this logic, we used data on Hofstede's (2023) cultural dimension on individualism vs. collectivism in our exploratory analyses. Results supported this contention: The negative association between financial scarcity and perceived control was weaker in more collectivistic societies relative to more individualistic societies ($\beta = -.05$, $p < .001$).

Fourth, we explored whether societal differences in the cultural values regarding traditionalism vs. secularism might be associated with the observed heterogeneity in effects. Compared to secular values, traditional values emphasize the importance of religion, family ties, and authority (Inglehart & Welzel, 2005). Literature shows that religious beliefs (Hoogeveen et al., 2018; Jackson & Bergeman, 2011; Kay et al., 2008, 2010), close social networks (Rothbaum et al., 1982), and authority (Friesen et al., 2014; Goode et al., 2014) can all function as secondary sources for control. To test whether traditional values might compensate for a control threat of financial scarcity, we used data on traditionalism vs. secularism from the World Values Survey (Haerpfer et al., 2020). In line with this reasoning, the negative association between financial scarcity and perceived control was weaker in societies with more traditional values compared to societies with more secular values ($\beta = -.06$, $p < .001$). Thus, also in societies with more traditional values, financial scarcity was associated less strongly with a perceived lack of control over one's life.

Finally, we also explored whether other individual level variables in our dataset might covary with the heterogeneity in effect sizes. For a different project, we had collected single item measures for religiosity and for the willingness to seek financial support from friends and family in times of need. In line with the results on traditional vs. secular values on the societal level, we found that the more religious people were, the less their experience of financial scarcity was associated with lower perceived control ($\beta = .09$, $p < .001$). Likewise, in line with prior research (Israel, 2016; Mikucka, 2013) and the results on collectivism on the societal level, we found that the more likely people were to seek financial support from family and friends in times of need, the smaller the negative association between financial scarcity and perceived control ($\beta = .09$, $p < .001$).

Taken together, our findings show that financial scarcity was negatively associated with perceived control. Yet, the strength of the association varied for societies and individuals. Surprisingly, we found that the negative association between financial scarcity and perceived control was smaller in societies with lower—not higher—levels of welfare provisions, quality of institutions, and labor conditions. These societal indicators were correlated with other prominent indicators used in cross-cultural research. Our exploratory analyses revealed that the negative association of financial scarcity with perceived control was also weaker in societies with lower economic development (but not economic equality) and more traditional and collectivistic values. In line with these findings, the association between financial scarcity and perceived control was also weaker for individuals who were

more religious and for those who would ask family or close friends for financial support when having financial problems.

Discussion

Perceiving control over one's life is a basic and universal human need (Hornsey et al., 2019; Landau et al., 2015). Yet, when people experience financial scarcity, this need might be threatened (Fritsche & Jugert, 2017). The feeling of not having control over one's life has far reaching consequences, including detrimental effects on goal pursuit (Bhanji et al., 2015; Heckhausen et al., 2010), and mental and physical health (Jonas et al., 2014; Ross & Mirowsky, 2013). To examine the association between financial scarcity and perceived control across the globe, we conducted a cross-societal study with 12,779 participants from 51 societies. We measured financial scarcity and perceived control with validated self-report items, and combined our data with societal indicators from several prominent available datasets.

In line with previous findings from WEIRD samples (Jachimowicz, 2022; Sommet & Spini, 2022), we found that across the societies included in our study, on average financial scarcity is negatively associated with perceived control over one's life. Our findings suggest that those with problematic household finances are likely to also experience a control threat. Crucially, the association between financial scarcity and perceived control varied considerably across the globe. In a large majority of the societies included in our study, we found evidence for a negative association between financial scarcity and control. In some societies, however, this association was so strong that financial scarcity explained approximately 25% of the variance in perceived control. Yet, in other societies, the association was smaller or not significantly different from zero. In two societies, we even found evidence for a positive association between financial scarcity and control. This suggests that the association between financial scarcity and perceived control might not be ubiquitous, highlighting the relevance of cross-societal research on financial scarcity.

In line with prior research (Attah et al., 2016; Chong & Calderon, 2000; Hruschka et al., 2014; Hruschka & Henrich, 2013; Israel, 2016; Kay et al., 2008, 2010; Muntaner et al., 2010) and a compensatory control logic (Landau et al, 2015), we had hypothesized that welfare provisions, quality of institutions, and labor conditions might help to explain this heterogeneity in associations across societies. Results, however, showed effects opposite to our hypotheses: The negative association between financial scarcity and perceived control was smaller in societies with lower—instead of higher—welfare provisions, lower quality of institutions, and worse labor conditions. These moderation effects were relatively strong and statistically robust when probed in a range of alternative models and when controlling for various background variables. Yet, given the contrast of our findings with the existing literature, more research is needed to reach more definite conclusions.

Moreover, in line with existing literature, exploratory analyses revealed that also in societies with lower economic development (Kley et al., 2022), as well as more traditional (Friesen et al., 2014; Goode et al., 2014; Hoogeveen et al., 2018; Jackson & Bergeman, 2011; Kay et al., 2008, 2010; Rothbaum

et al., 1982) and more collectivist values (Mikucka, 2013; Rothbaum et al., 1982), financial scarcity was associated less with perceived control. Notably, these indicators correlated strongly with the cross-societal indicators from our pre-registered analyses. Thus, a society with low welfare provisions, low quality of institutions, and weak labor rights was also more likely to be less economically developed and had a stronger prevalence of traditional and collectivistic values.

A limitation of this study is its correlational nature, preventing causal interpretations of the findings. Yet, in line with the recent meta-scientific debate on causal inferences from non-experimental psychological research (Grosz et al., 2020), we see value in discussing the likelihood of certain causal explanations for the observed pattern of results. Regarding the overall negative association between financial scarcity and perceived control, we think that a causal negative effect of financial scarcity on control is indeed the most likely explanation for the data. A causal mechanism suggesting that the experience of having too little financial resources to meet demands can lead to a perceived inability to achieve goals and determine life outcomes seems logical and is supported by previous findings (Jachimowicz, 2022; Sommet & Spini, 2022; Van Dijk et al., 2022). However, people who experience low control over their lives might also be less able to regulate negative emotions and stress about their finances (Wallstone et al., 1987; Webb et al., 2012) and might have a stronger short-term focus (Pepper & Nettle, 2017), which are central to the experience of financial scarcity (De Bruijn & Antonides, 2022; Van Dijk et al., 2022). While some experimental evidence for a causal effect of financial scarcity on reduced control exists (Hilbert et al., 2022a; To et al., 2023) future experimental or longitudinal research might help to better understand the causal mechanism between these concepts.

Regarding the observed moderation of welfare provisions, quality of institutions, and labor conditions (opposite to our hypotheses), potential causal explanations are much less clear. While these findings were statistically robust, they were in conflict with prior results and theory suggesting that these societal qualities might buffer against a control threat of financial scarcity (Attah et al., 2016; Chong & Calderon, 2000; Hruschka et al., 2014; Hruschka & Henrich, 2013; Israel, 2016; Kay et al., 2008, 2010; Landau et al, 2015; Muntaner et al., 2010). Exploratory analyses further revealed that the societal qualities from our preregistered hypotheses correlate with many other societal indicators that also might affect the association between financial scarcity and control. To us, it seems more likely that the observed heterogeneity in associations across societies could be explained by either one of these factors or a combination of them. Yet, follow-up research is needed to test whether the exploratory findings can be confirmed in other data, and future experimental or longitudinal studies would be valuable to generate a better understanding of potential causal mechanisms.

Conclusion

Across the globe, people experience financial scarcity. In a large cross-societal study, we found that overall, this experience is associated with the perception of lower control. Yet, we also found that the negative association between financial and perceived control is not ubiquitous. Contrary to our hypotheses, the association was weaker in societies with lower welfare provisions, lower quality of

institutions, and worse labor conditions. Exploratory analyses additionally revealed that the association was also weaker in societies with lower economic development as well as with more traditional and collectivistic values. These findings highlight the relevance of perceived control for people who experience financial scarcity, as well as the importance to conduct research with culturally diverse samples.

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Appendix A: Descriptives

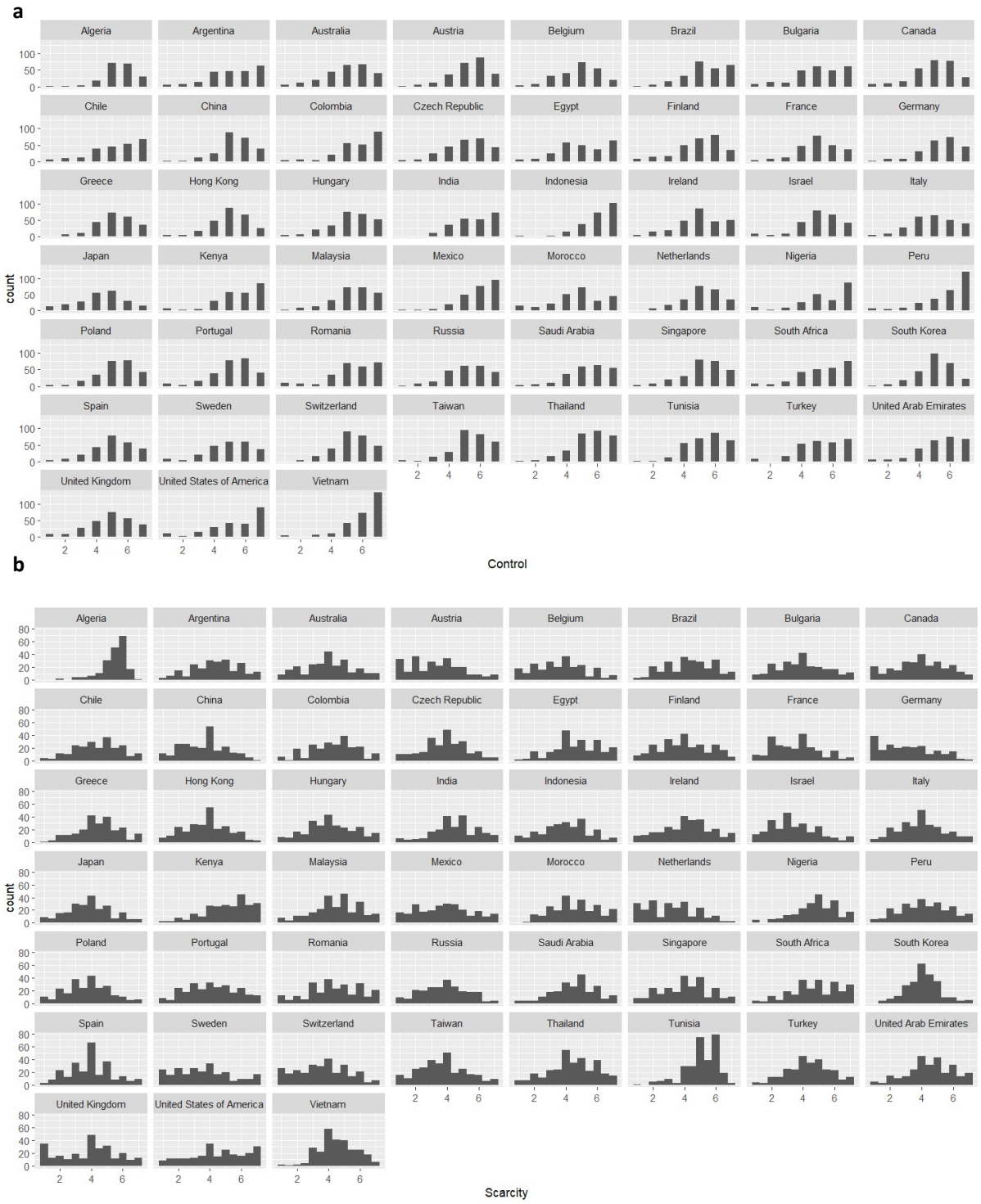
Table 1
Sample Descriptives per Society

			Age		Education		Scarcity		Control	
Country	*N*	*% female*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Algeria	196	29.08	36.92	10.72	4.83	0.85	5.47	0.83	5.46	1.08
Argentina	227	55.07	37.20	12.56	4.20	0.99	4.39	1.46	5.24	1.55
Australia	254	53.94	44.18	12.74	4.63	1.09	3.99	1.56	5.04	1.47
Austria	253	52.17	39.40	13.43	4.40	1.26	3.36	1.63	5.30	1.24
Belgium	232	52.16	41.25	13.19	3.76	1.27	3.64	1.53	4.80	1.34
Brazil	251	51.39	37.85	12.24	4.35	1.05	4.32	1.50	5.39	1.36
Bulgaria	249	43.37	38.80	11.98	4.33	1.17	3.94	1.55	5.11	1.58
Canada	274	54.38	44.83	12.71	4.54	0.99	3.93	1.62	4.97	1.35
Chile	231	62.77	34.39	12.10	4.19	1.10	4.34	1.45	5.35	1.54
China	241	47.72	37.89	11.34	4.88	0.62	3.62	1.39	5.36	1.15
Colombia	230	50.43	38.77	12.81	4.48	0.95	4.30	1.42	5.77	1.36
Czech Republic	256	51.17	39.46	13.68	2.89	1.33	3.89	1.40	5.12	1.37
Egypt	247	41.30	35.08	11.05	4.76	0.77	4.63	1.44	5.06	1.58
Finland	274	52.19	41.76	12.72	3.94	1.33	3.98	1.55	4.98	1.47
France	234	52.56	43.66	11.91	4.37	1.23	3.55	1.47	5.07	1.33
Germany	229	51.97	45.55	12.33	4.63	1.27	3.20	1.65	5.39	1.29
Greece	229	54.15	38.42	12.19	4.34	1.16	4.46	1.28	5.18	1.24
Hong Kong	251	50.20	38.73	12.50	3.58	1.13	3.80	1.35	5.02	1.24
Hungary	259	52.12	40.93	14.28	3.62	1.09	4.14	1.51	5.24	1.39
India	225	50.22	37.65	12.44	5.35	0.73	4.49	1.37	5.61	1.25
Indonesia	231	48.05	37.90	11.92	4.52	0.95	4.00	1.44	6.07	1.10
Ireland	264	57.58	40.70	11.82	4.43	1.07	4.15	1.50	4.97	1.48
Israel	251	47.01	40.15	13.08	4.44	1.16	3.41	1.46	5.17	1.37
Italy	258	50.78	40.91	13.01	3.70	1.12	3.97	1.43	4.87	1.45
Japan	224	39.29	43.04	11.23	4.29	1.02	3.86	1.35	4.27	1.54
Kenya	245	58.78	31.47	9.38	4.55	0.80	5.13	1.39	5.61	1.42
Korea	260	45.00	40.59	11.87	4.55	0.94	4.12	1.07	5.04	1.18
Malaysia	258	45.35	37.28	12.00	4.29	1.05	4.49	1.43	5.34	1.36
Mexico	250	50.80	37.57	12.03	4.65	0.74	3.83	1.66	5.87	1.23
Morocco	245	35.10	30.80	9.36	4.47	1.03	4.57	1.38	4.70	1.66
Netherlands	238	53.78	42.56	12.53	3.63	0.94	3.14	1.52	5.16	1.27
Nigeria	222	70.72	30.43	10.70	4.62	0.94	4.85	1.29	5.48	1.64
Peru	266	52.63	34.15	11.12	4.41	0.98	4.21	1.50	5.83	1.47
Poland	252	48.81	38.45	13.08	4.23	1.19	3.78	1.43	5.27	1.30
Portugal	268	51.12	40.16	13.19	4.38	1.19	4.11	1.56	5.20	1.35
Romania	257	49.42	39.43	13.56	4.35	1.11	4.33	1.61	5.38	1.50
Russia	237	51.05	40.77	12.46	4.67	0.93	3.81	1.42	5.19	1.34
Saudi Arabia	234	47.86	33.98	9.81	4.68	0.84	4.53	1.36	5.37	1.38
Singapore	265	47.55	39.78	12.55	4.72	0.98	4.08	1.52	5.23	1.37
South Africa	252	52.38	37.55	12.87	4.20	1.01	4.77	1.51	5.35	1.55
Spain	254	46.46	40.45	12.24	4.35	1.05	3.95	1.34	5.04	1.40
Sweden	237	50.63	43.77	13.25	3.01	1.28	3.59	1.73	5.00	1.47
Switzerland	281	53.74	41.66	13.00	4.77	1.14	3.63	1.57	5.29	1.22
Taiwan	288	46.53	36.97	12.07	3.85	0.79	3.70	1.47	5.40	1.27
Thailand	310	50.32	39.90	13.03	4.71	0.93	4.43	1.44	5.52	1.25
Tunisia	294	39.46	40.56	11.99	4.63	0.88	5.09	1.03	5.39	1.26
Turkey	266	53.38	35.34	11.50	4.41	1.00	4.36	1.32	5.27	1.47
United Arab Emirates	270	46.67	34.24	10.30	4.92	0.79	4.54	1.40	5.37	1.45
United Kingdom	261	54.02	43.07	13.32	4.33	1.10	3.84	1.74	4.87	1.49
United States of America	228	51.75	44.11	14.01	4.58	1.12	4.53	1.74	5.47	1.67
Vietnam	272	51.47	33.53	9.65	4.79	0.80	4.56	1.13	6.08	1.24

Note. Education was measured as a categorical variable with categories 1 = Elementary school, 2 = Middle school, 3 = High school, 4 = Some college, 5 = Bachelor degree, 6 = Graduate school or higher.

Figure 1

Histograms for Perceived Control (a) and Financial Scarcity (b) per Society



Appendix B: Principal Component Analyses (PCA) for Societal Indicators

Imputation of Missing Data

Before conducting the PCA for each societal indicator, missing data were imputed with the *missMDA* package using the 'estim_ncpPCA' function (Josse & Husson, 2016). This function imputes missing data based on a PCA estimation with cross-validation. In a first step, the optimal number of dimensions that should be used for PCA estimation algorithm are calculated. Then, for the "leave-one-out" cross-validation that was used here, missing data are imputed based on subsamples where for each iteration, one case is excluded from the dataset. The iterative algorithm imputes values for each subsample until the model converges (i.e., the PCA has minimum prediction error).

Table 2

Principal Component Analyses with Imputed Data for Societal Indicators

					Loadings	
Component	*Indicator*	*Source*	*Year*	*Imputed*	*C1*	*C2*
Welfare Provisions	Social Safety Net Expenditure by GDP	WB	2020	0	.70	
	Social Protection	WEF	2020	6	.70	
				Explained variance	*92.6%*	
Quality of Institutions	Voice and Accountability	WB	2020	1	.30	
	Regulatory Quality	WB	2020	1	.33	
	Political Stability and Absence of Violence/Terrorism	WB	2020	1	.31	
	Rule of Law	WB	2020	1	.33	
	Government Effectiveness	WB	2020	1	.32	
	Control of Corruption	WB	2020	1	.33	
	Liberal Component Index	VDEM	2021	0	.27	
	Efficient and Inclusive Institutions	WEF	2020	6	.34	
	Rule of Law	FH	2020	0	.32	
	Functioning of Government	EIU	2020	1	.30	
				Explained variance	*80.1%*	
Labor Conditions	Working Conditions	WEF	2020	6	.62	-.25
	Fair Wages	WEF	2020	6	.59	-.47
	Work Opportunities	WEF	2020	6	.51	.85
				Explained variance	*69.3%*	*21.0%*

Note. C1 = Component 1, C2 = Component 2, WB = World Bank, WEF = World Economic Forum, VDEM = Varieties of Democracies Institute, FH = Freedom House, EIU = The Economist Intelligence Unit.

Appendix C: Robustness Checks

Table 2

Robustness Checks with Alternative Model Specifications

	Robustness check 1				**Robustness check 2**				**Robustness check 3**				**Robustness check 4**			
		95% CI				*95% CI*				*95% CI*				*95% CI*		
Predictors	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Financial Scarcity	-0.24	-0.29	-0.19	**< .001**	-0.25	-0.27	-0.22	**< .001**	-0.21	-0.23	-0.18	**< .001**	-0.25	-0.28	-0.23	**< .001**
Scarcity x Welfare	-0.09	-0.14	-0.04	**< .001**	-0.09	-0.14	-0.04	**< .001**	-0.08	-0.11	-0.06	**< .001**	-0.07	-0.09	-0.05	**< .001**
Scarcity x Institutions	-0.10	-0.15	-0.06	**< .001**	-0.10	-0.25	-0.06	**< .001**	-0.11	-0.13	-0.08	**< .001**	-0.07	-0.10	-0.05	**< .001**
Scarcity x Labor Conditions	-0.08	-0.13	-0.04	**< .001**	-0.08	-0.13	-0.04	**< .001**	-0.08	-0.10	-0.06	**< .001**	-0.06	-0.08	-0.03	**< .001**
Scarcity x Work Opportunities	0.01	-0.04	0.06	.654	0.01	-0.04	0.06	.635	0.00	-0.02	0.02	.970	0.02	0.00	0.05	.065

Note. Robustness check 1 = models include random slopes for societies. Robustness check 2 = models without controlling for education, age, and gender. Robustness check 3 = models with PIFS scale excluding item on financial control. Robustness check 4 = models excluding data for Algeria, Tunisia and Sweden. All models include random intercepts for societies. Models 1–3 are based on i = 12779 observations clustered in N = 51 societies. Model 4 is based on i = 12044 observations clustered in N = 48 societies. Bold p-values are statistically significant. Est = estimates, LL = lower limit, UL = upper limit.

Table 3

Robustness Checks Controlling for Societal Indicators from Exploratory Analyses

	Robustness check 5				**Robustness check 6**				**Robustness check 7**				**Robustness check 8**			
		95% CI				*95% CI*				*95% CI*				*95% CI*		
Predictors	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Financial scarcity	-0.23	-0.26	-0.21	**< .001**	-0.23	-0.26	-0.21	**< .001**	-0.23	-0.26	-0.21	**< .001**	-0.23	-0.26	-0.21	**< .001**
Scarcity x Welfare1	-0.07	-0.10	-0.05	**< .001**	-0.07	-0.10	-0.05	**< .001**	-0.07	-0.10	-0.05	**< .001**	-0.07	-0.10	-0.05	**< .001**
Scarcity x Institution1	-0.10	-0.15	-0.06	**< .001**	-0.10	-0.15	-0.06	**< .001**	-0.10	-0.15	-0.06	**< .001**	-0.10	-0.15	-0.06	**< .001**
Scarcity x Labor1	-0.06	-0.09	-0.02	**< .001**	-0.06	-0.09	-0.02	**< .001**	-0.06	-0.09	-0.02	**< .001**	-0.06	-0.09	-0.02	**< .001**
Scarcity x Labor2	0.01	-0.01	0.03	.379	0.01	-0.01	0.03	.379	0.01	-0.01	0.03	.379	0.01	-0.01	0.03	.379
$N_{Societies}$	50				43				50				43			
$I_{Observations}$	12483				10733				12519				10848			

5 = controlling for GDP per capita. Robustness check 6 = controlling for Gini. Robustness check 7 = controlling for Individualism vs. Collectivism. Robustness check 8 = controlling for Secular values vs. Traditional values. All models include random intercepts for societies and an interaction term between financial scarcity and the respective control variable. Bold p-values are statistically significant. Est = estimates, LL = lower limit, UL = upper limit.

Given that the data were collected during the COVID-19 pandemic, it was possible that societal differences in the extent of fatalities or governmental restrictions might confound our findings. Therefore, we collected data on three items regarding the COVID-19 pandemic. Participants indicated whether they thought about the COVID-19 pandemic while responding to the items, whether their health was affected by the COVID-19 pandemic, and whether their financial situation was affected by the COVID-19 pandemic.

Table 4

Robustness Checks with Societal Means for Financial Scarcity and Individual Level Variables

	Robustness check 9				**Robustness check 10**				**Robustness check 11**			
		95% CI				*95% CI*				*95% CI*		
Predictors	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Financial Scarcity	-0.24	-0.26	-0.22	**< .001**	-0.25	-0.28	-0.23	**< .001**	-0.27	-0.29	-0.24	**< .001**
Scarcity x Welfare	-0.09	-0.11	-0.07	**< .001**	-0.09	-0.12	-0.07	**< .001**	-0.09	-0.11	-0.07	**< .001**
Scarcity x Institutions	-0.10	-0.13	-0.08	**< .001**	-0.10	-0.13	-0.08	**< .001**	-0.10	-0.13	-0.08	**< .001**
Scarcity x Labor Conditions	-0.09	-0.11	-0.06	**< .001**	-0.09	-0.11	-0.06	**< .001**	-0.09	-0.11	-0.06	**< .001**
Scarcity x Work Opportunities	0.01	-0.01	0.03	.435	0.01	-0.02	0.03	.562	0.01	-0.02	0.03	.478

Note. Robustness check 9 = models include fixed effect for societal level means of financial scarcity. Robustness check 10 = controlling for individual level religiosity. Robustness check 11 = controlling for individual level family support. All models include random intercepts for societies. Robustness checks 10 and 11 include interaction term between financial scarcity and respective control variable. Models are based on i = 12771 observations clustered in N = 51 societies. Bold p-values are statistically significant. Est = estimates, LL = lower limit, UL = upper limit.

Table 5

Robustness Checks Controlling for the Impact of the COVID-19 Pandemic

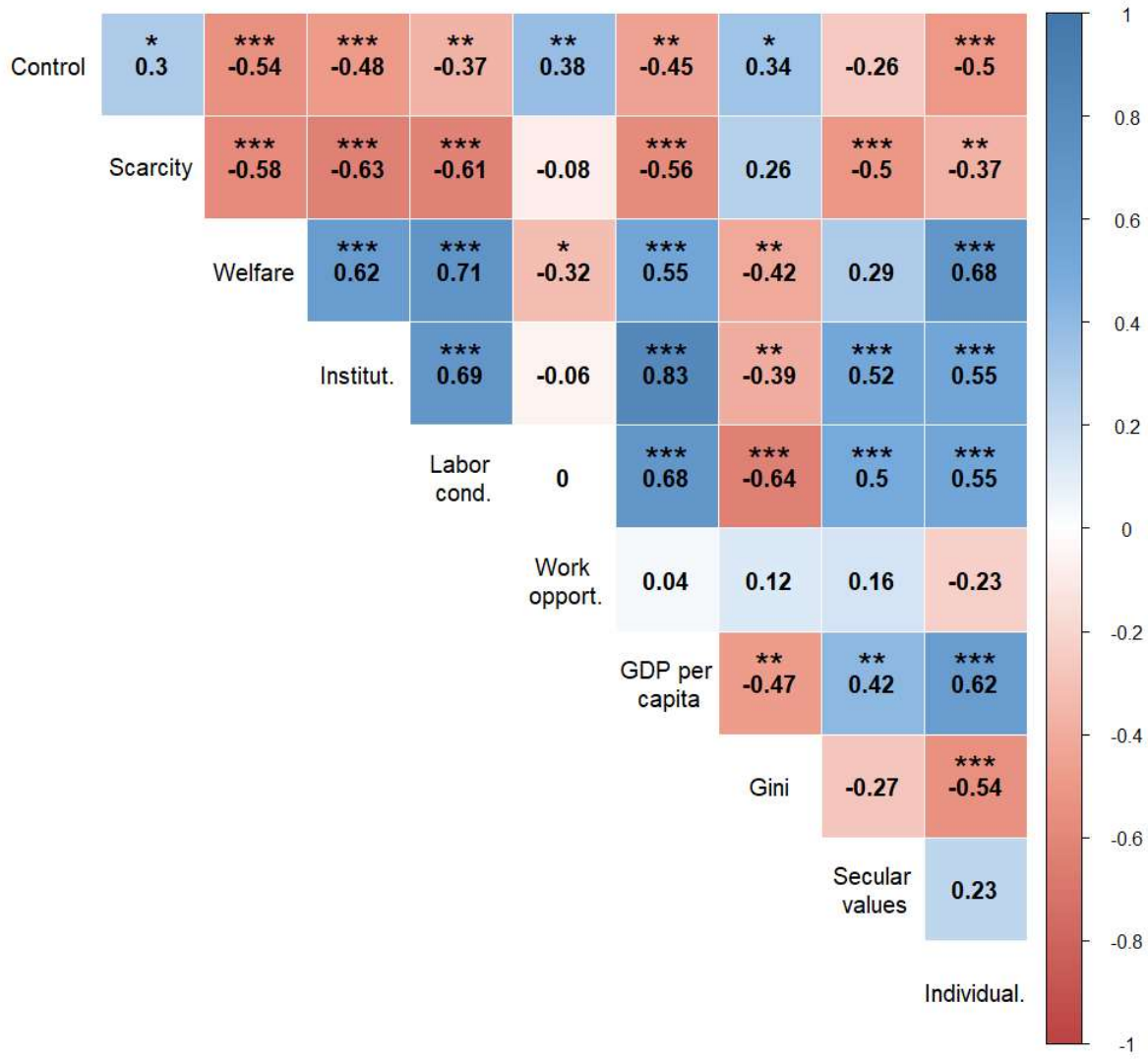
	Robustness check 12				**Robustness check 13**				**Robustness check 14**			
		95% CI				*95% CI*				*95% CI*		
Predictors	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Financial Scarcity	-0.46	-0.51	-0.41	**< .001**	-0.46	-0.51	-0.41	**< .001**	-0.47	-0.53	-0.41	**< .001**
Scarcity x Welfare	-0.08	-0.10	-0.05	**< .001**	-0.07	-0.10	-0.05	**< .001**	-0.07	-0.10	-0.05	**< .001**
Scarcity x Institutions	-0.09	-0.12	-0.07	**< .001**	-0.09	-0.12	-0.07	**< .001**	-0.09	-0.11	-0.06	**< .001**
Scarcity x Labor Conditions	-0.07	-0.10	-0.05	**< .001**	-0.07	-0.10	-0.05	**< .001**	-0.07	-0.09	-0.04	**< .001**
Scarcity x Work Opportunities	0.00	-0.02	0.03	.730	0.00	-0.02	0.02	.980	0.00	-0.02	0.03	.697

Note. Robustness check 12 = controlling for influence of COVID-19 on responses. Robustness check 13 = controlling for influence of COVID-19 on health. Robustness check 14 = controlling for influence of COVID-19 on financial situation". All models include random intercepts for societies and interaction terms for financial scarcity and the control variable. Models are based on i = 12771 observations clustered in N = 51 societies. Bold p-values are statistically significant. Est = estimates, LL = lower limit, UL = upper limit.

Appendix D: Exploratory Analyses

Figure 4

Correlation Table for Societal Level Associations between variables from Pre-registered and Exploratory Models



Note. Scarcity and Control variables were aggregated to societal mean scores. Missing cases were excluded for pairwise comparisons. *$p < .05$, **$p < .01$, ***$p < .001$.

Table 1

Model Summaries for Exploratory Analyses with Societal Indicators

	Model 1				**Model 2**				**Model 3**				**Model 4**			
		95% CI				*95% CI*				*95% CI*				*95% CI*		
	Est	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Predictors																
Intercept	5.27	5.18	5.36	**< .001**	5.26	5.16	5.37	**< .001**	5.27	5.19	5.35	**< .001**	5.27	5.17	5.38	**< .001**
Financial scarcity	-0.23	-0.26	-0.21	**< .001**	-0.25	-0.27	-0.22	**< .001**	-0.24	-0.26	-0.22	**< .001**	-0.25	-0.28	-0.23	**< .001**
Education	0.04	0.02	0.06	**.001**	0.04	0.01	0.06	**.004**	0.04	0.02	0.07	**< .001**	0.05	0.02	0.07	**< .001**
Age	0.01	-0.01	0.04	.327	0.01	-0.02	0.04	.496	0.02	-0.01	0.04	.155	0.01	-0.01	0.04	.356
Gender	-0.01	-0.06	0.03	.571	0.02	-0.04	0.07	.549	-0.01	-0.06	0.04	.627	-0.01	-0.07	0.04	.605
GDP per capita	-0.15	-0.23	-0.06	**.001**												
Scarcity × GDP per capita	-0.08	-0.10	-0.06	**< .001**												
Gini					0.12	0.02	0.22	.019								
Scarcity × Gini					0.02	-0.01	0.04	.216								
Individualism									-0.16	-0.25	-0.08	**< .001**				
Scarcity × Individualism									-0.05	-0.07	-0.02	**< .001**				
Secular values													-0.09	-0.19	0.01	.092
Scarcity × Secular values													-0.06	-0.08	-0.03	**< .001**
Random Effects																
Random effects variance (σ^2)	1.86				1.85				1.85				1.85			
Random intercept variance (τ_{00})	0.08				0.10				0.08				0.10			
ICC	0.04				0.05				0.04				0.05			
$N_{country}$	50				43				50				43			
Observations	12483				10733				12519				10848			
Marginal R^2 / Conditional R^2	0.043 / 0.084				0.038 / 0.089				0.046 / 0.084				0.040 / 0.091			

Note. Results for preregistered mixed models predicting perceived control. Models include random intercepts for societies, are based on i = 12779 observations clustered in n = 51 societies. The predictors financial scarcity, education, and age were measured on the individual level and z-standardized within each society. The societal indicators welfare, institutions, labor conditions, and work opportunities were measured on the societal level. Bold p-values are statistically significant. Est = estimates, LL = lower limit, UL = upper limit.

Table 7
Model Summaries for Exploratory Analyses with Individual Level Variables

	Model 5				Model 6			
		95% CI				95% CI		
	Est	*LL*	*UL*	*p*	*Est*	*LL*	*UL*	*p*
Predictors								
Intercept	5.27	5.18	5.36	**< .001**	5.25	5.15	5.34	**< .001**
Scarcity	-0.25	-0.28	-0.23	**< .001**	-0.27	-0.29	-0.24	**< .001**
Education	0.04	0.01	0.06	**.002**	0.04	0.01	0.06	**.003**
Age	0.01	-0.01	0.03	.428	0.03	0.00	0.05	.026
Gender	-0.02	-0.07	0.03	.426	0.01	-0.04	0.05	.832
Religiosity	0.13	0.11	0.16	**< .001**				
Scarcity × Religiosity	0.09	0.07	0.12	**< .001**				
Family support					0.15	0.13	0.18	**< .001**
Scarcity × Family Support					0.09	0.07	0.11	**< .001**
Random Effects								
Random effects variance (σ^2)	1.83				1.82			
Random intercept variance (τ_{00})	0.10				0.10			
ICC	0.05				0.05			
Marginal R^2 / Conditional R^2	0.045 / 0.094				0.048 / 0.096			

Note. Model 5 includes a self-report item for religiosity. Model 6 includes a self-report item on whether one would ask family or close friends for help when having financial problems. All models include random intercepts for societies. Adjusted alpha level after Bonferroni-correction for 6 alternative models is α = .008. Models are based on *i* = 12771 observations clustered in *N* = 51 societies. Est = estimates, LL = lower limit, UL = upper limit.