


When Paying Is (Even More) Painful: Personality-Based Heterogeneity in Consumption Responses to Economic Hardship

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Abstract

Economic downturns lead to declining consumer spending, but people vary considerably in their consumption responses. We investigate an important driver of this heterogeneity, personality. Trait level variation has been observed in the levels of psychological discomfort when making a purchase (“the pain of paying”). We test whether individuals who experience more pain when paying are not only reluctant spenders in general but also decrease spending more sharply when experiencing economic hardship, indicating an increased “pain sensitivity.” Evidence from a two-wave online survey ($N = 942$), a representative longitudinal database ($N = 3,181$) and a cross-national survey ($N = 11,972$) converge to support the hypothesis that the pain of paying moderates the relationship between economic hardship and spending. Our findings provide evidence that personality can shape people’s responses to economic downturns and indicate the potential role of psychology-based interventions in macro-economic policy.

Keywords

economic hardship, income, money attitudes, pain of paying

When the economy booms, so does consumer spending, and when recessions hit, spending falls (Kamakura & Yuxing Du, 2011). A paradox of economic downturns is that declining consumer spending—itsself a reaction to the economy’s contraction—also undermines the prospects for recovery by reducing demand for goods and services (Keynes, 1933). Therefore, given the fundamental role of consumption in driving economic growth, understanding variation in how consumers respond to economic hardship is of crucial importance to both macro-economic policy and societal well-being.

Explanations for why consumption falls in response to economic downturns have typically focused either on the direct impact of economic crises reducing spending power (Hall, 1993; Katona, 1968), or on how economic crises increase feelings of uncertainty leading households to delay purchases of durable goods and save for precautionary reasons (Bertola et al., 2005; Carroll & Kimball, 2016; De Nardi et al., 2011). However, these explanations cannot explain all of the observed change in spending. For example, even for those whose finances are not directly affected by a given crisis (i.e., those whose incomes and employment status do not change), this group still saves more and pays down their debts during a recession, meaning less is spent overall on goods and services (Mody et al., 2012). In this research, we test a complementary psychological

explanation that focuses on how personality interacts with economic conditions to make spending money (even) more painful for certain individuals.

Spending money elicits a *pain of paying* (Zellermayer, 1996), and this pain associated with paying plays an important role in consumer self-regulation to limit excessive consumption (Prelec & Loewenstein, 1998). This is not simply a figurative statement; studies have found that areas of the brain that are active when experiencing physical pain are also active when people spend financial resources (Knutson et al., 2007). Research on this phenomenon has established that not all individuals are equally sensitive to the pain of paying, with studies measuring this variability using the Spendthrift-Tightwad (STTW) Scale, which distinguishes between those who experience the pain of paying intensely “tightwads,” from those who experience a minimal pain of paying “spendthrifts” (Rick et al., 2007).

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The degree to which a person experiences pain in response to consumption can be conceptualized as a stable personality trait. Psychological traits are known to explain variation in consumption behavior (Landis & Gladstone, 2017; Matz et al., 2016; Quoidbach et al., 2010), and research on the pain of paying has established that the STTW continuum explains variation in who spends more versus less in general (Rick, 2018). However, this relationship may also depend on the economic circumstances an individual is situated in. For example, while research has established that tightwads are less willing to spend in controlled conditions (*for review see* Rick, 2018), studies have yet to test how this personality trait interacts with a person's economic environment, that is, personality–environment interaction (Hunt, 1975), which is critical to understanding how the pain of paying impacts behavior in the real world. Addressing this we propose that individual differences in the pain of paying are amplified when individuals experience economic hardship.

Recessions, and economic hardship more broadly, are extremely salient experiences for individuals, with the American Psychological Association finding “financial problems” to be the leading cause of stress for people in their annual Stress in America survey (APA, 2015). Just as anxiety increases sensitivity to physical pain (Ploghaus et al., 2001), we propose that economic hardship increases sensitivity to the “pain of paying.” In turn, we expect this increase to be most strongly experienced by those with a low pain threshold, namely, tightwads. Therefore, we hypothesize that the extent to which individuals experience the pain of paying (i.e., if they are more a tightwad than a spendthrift) will have a multiplicative effect such that for every unit increase in economic hardship tightwad's spending will be reduced at a greater rate than spendthrifts.

Therefore, practically speaking, we propose that tightwads will disproportionately drive down spending in response to an economic downturn, because they are more sensitive to the external economic cues in their environment.

This hypothesis is tested across three studies. Study 1 ($N = 942$) uses two waves of primary data collected from an online panel in the United States. Study 2 ($N = 3,181$; $N_{\text{observations}} = 7,272$) uses a publicly available longitudinal dataset from the Netherlands. Study 3 ($N = 11,972$) addresses the generalizability of the effect using a large multi-country nationally representative sample. The data, code, and materials for all studies are accessible at <https://tinyurl.com/2p8sze7p>.

Study 1: Two-Wave Study

Method

Participants and Procedure. This study aimed to investigate the spending behavior of individuals experiencing financial hardship, with a particular focus on the relationship between pain of paying and spending habits. The study

collected primary data from an online panel (MTurk) using a two-wave design, with measures recorded at both time points. Of the 964 initial respondents, 22 were removed for failing attention checks at Time 2, resulting in a final sample size of 942 participants. The participants were between 18 and 72 years old, with an average age of 35 ($SD = 11.11$). The study was conducted in 2019 4 months apart, with a 36.0% retention rate at time 2 ($N = 339$). Respondents were aged between 18 and 72 ($M_{\text{age}} = 35$ years, $SD = 11.11$), 41% were married, 45% had at least a college degree, and 71% were employed full-time. Average annual household income (reported by marking one of 10 categories) was in the US\$45,000 to US\$54,999 range. The benefits of a two-wave design over a cross-sectional survey included the ability to capture temporal changes, improve estimation accuracy, and conduct longitudinal analysis.

Measures

Monthly Spending Amount. Participants in the study reported their monthly spending amounts by providing a numerical response to the question: How much do you spend, in dollars, per month on average, excluding rent/mortgage?

To minimize the influence of extreme outliers on data analysis, we applied winsorization to the data at the 1st and 99th percentiles.¹ The winsorized spending variable at time 1 showed significant left skewness (see Figure S1a and S1b in supplementary materials), therefore, we log-transformed the spending measure.

Spendthrift-Tightwad Scale. The STTW Scale (Rick et al., 2007), consisting of four items, was administered to participants. The item wordings are provided in Supplementary Online Materials (SOM) 1. The items were standardized before being averaged, due to the varying response scales (three items on a 5-point scale, one on an 11-point scale), resulting in a composite scale with good internal consistency ($\alpha = .75$). It should be noted that items were coded such that higher scores indicated greater tightwadism (i.e., a higher level of discomfort when spending). One example item asked participants to choose between two descriptions of spending habits, with options ranging from 1 “Tightwad (difficulty spending money)” to 11 “Spendthrift (difficulty controlling spending).” The term “tightwadism” will be used in this manuscript to refer to high scores on the STTW Scale.

Economic Hardship. The extent to which participant's current financial situations was adequate to meet their needs was measured using four items (Michalos, 1975). These items asked participants to consider their current financial situation and report: (a) “How well does your financial situation right now approach what you want” (1 “Not at all”—7 “Matches or is better than what I want”), (b) “How acceptable to you is the gap between what you

Table 1. Means and Pairwise Correlations for Variables used in Study 1

Variables	M	SD	1	2	3	4	5	6
1. Economic Hardship	-0.00	0.90	—					
2. Tightwadism (STD)	-0.00	0.76	.09***	—				
3. Spending (Wave 1)	6.64	1.00	.19***	.14***	—			
4. Spending (Wave 2)	6.71	0.91	.29***	.11*	.60***	—		
5. Age	35.48	11.11	-.15***	-.06	.18***	.05	—	
6. Sex (Female)	1.45	0.51	-.16***	.04	.03	.03	.16***	—
10. Income (household)	4.93	2.30	.39***	.13***	.35***	.39***	-.05	-.03

† $p < .1$. * $p < .05$. ** $p < .01$. *** $p < .001$.

have right now and what you want?" (1 "Not at all"—8 "There is no gap between what I have and what I want"), (c) "How does your financial situation right now compare to the average person your age?" (1 "Much Worse"—7 "Much Better"), and (d) "How acceptable to you is the gap between what you have right now and what the average person your age has?" (1 "Not at all"—8 "There is no gap between what I have and what I want"). These items were standardized and reversed before calculating a composite scale ($\alpha = .93$).

Controls. We control for basic demographics, including age, gender, relationship status, education level, and employment status.

Results

Correlations and descriptive statistics are presented in Table 1. We first analyzed the variables collected in Wave 1 of our study. In line with our expectations, those who experienced greater economic hardship reported less spending (Table 2; $B_{\text{hardship}} = -.19$, $SE = .04$, $t = -5.01$, $p < .001$, 95% CI $[-.27, -.12]$). More importantly, participant's propensity to experience the pain of paying—tightwadism—moderated the effect of economic hardship on spending (without controls, $B_{\text{interaction}} = -.14$, $SE = .05$, $t = -3.09$, $p = .002$, 95% CI $[-.23, -.05]$; with controls, $B_{\text{interaction}} = -.11$, $SE = .04$, $t = -2.54$, $p = .011$, 95% CI $[-.19, -.02]$). Figure 1A illustrates that tightwads (vs. spendthrifts) reported a larger decrease in spending when they faced economic difficulties.

We then regressed spending at Wave 2 on all study variables measured in Wave 1, controlling for spending at Wave 1. This was to test whether the pain of paying moderated the effect of economic hardship on spending over time. Table 3 shows that those who experienced greater economic hardship reported marginally less spending at time 2 (Table 3; $B_{\text{hardship}} = -0.10$, $SE = .05$, $t = -1.94$, $p = .053$, 95% CI $[-.20, .00]$). Furthermore, tightwadism significantly interacted with economic hardship to predict spending at wave 2 ($B_{\text{hardship}} = -0.12$, $SE = .05$, $t = -2.49$, $p = .013$, 95% CI $[-.22, -.03]$; with controls,

$B_{\text{interaction}} = -.11$, $SE = .05$, $t = -2.17$, $p = .030$, 95% CI $[-.21, -.01]$; see Figure 1B). These results indicate that tightwads (vs. spendthrifts) reduced their spending more when they experienced economic difficulties over time. Thus, our hypothesis that personality-based variation in the pain of paying moderates spending during times of economic hardship was supported by this study.

Study 2: Dutch Longitudinal Panel Data

Method

Participants and Procedure. Study 2 tested our hypothesis in a longitudinal setting, using data from the Netherlands collected between 2010 and 2012. These data included 10 repeated measures of economic hardship and self-reported changes in spending intention. From a single timepoint, we also have survey measures of the pain of paying using the STTW scale. We expected that participants' economic circumstances would vary more during this period, as it followed the 2008–2009 recession. We hypothesized that changes in economic hardship would influence changes in spending over time, and that this effect would be moderated by the pain of paying.

Table 4 shows a summary of when measures were recorded. The data were obtained from two sources: the Longitudinal Internet Studies for the Social Sciences (LISS)—a representative sample of the Dutch population; and the Tilburg Consumer Outlook Monitor—a subset of the LISS panel. The final sample consisted of 7,272 observations from 3,181 participants (55.8% Female; $M_{\text{age}} = 53$ years, $SD = 16.7$) who completed the relevant survey questions.

Measures

STTW Scale. We measured the pain of paying using the four-item spendthrift tightwad scale. The scale was administered in a single-wave study on emotions and finances. We standardized and averaged the items ($M = .00$, $SD = .67$). The scale had low internal reliability ($\alpha = .58$). We provide more details on the translation of the scale into Dutch, which may have affected this result, in SOM 3.

Table 2. OLS Regression Model Predicting Monthly Spending From Economic Hardship, Tightwadism, Their Interaction and Controls in Study 1 at Time 1

Variables	Model 1		Model 2		Model 3	
	<i>b</i>	SE	<i>b</i>	SE	<i>b</i>	SE
Spending (T1)						
Economic Hardship (a)	−0.16***	−0.04	−0.12**	−0.04	−0.10*	−0.04
Tightwadism (b)	−0.19***	−0.04	−0.19***	−0.04	−0.01	−0.04
Interaction (a × b)			−0.14**	−0.05	−0.11*	−0.04
Controls						
Age					0.02***	0.00
Sex (female)					0.09	−0.062
Relationship status (married)						
Separated/divorced					−0.25*	−0.11
Widowed					−0.08	−0.24
Single					−0.31***	−0.07
Employment (full time)						
Part time					−0.38***	−0.10
Not employed					−0.30**	−0.12
Student					−0.44**	−0.16
Retired					−0.05	−0.19
Education (college degree)						
High school					−0.23*	−0.10
Some college					−0.22**	−0.07
Masters (or higher)					−0.07	−0.10
Income (household)					0.11***	−0.02
Constant	6.64***	−0.03	6.65***	−0.03	5.94***	−0.16
Observations	956		956		942	

Note. Indicator variables for responses “I prefer to skip this question” not shown. Robust standard errors in parentheses.

† $p < .1$. * $p < .05$. ** $p < .01$. *** $p < .001$.

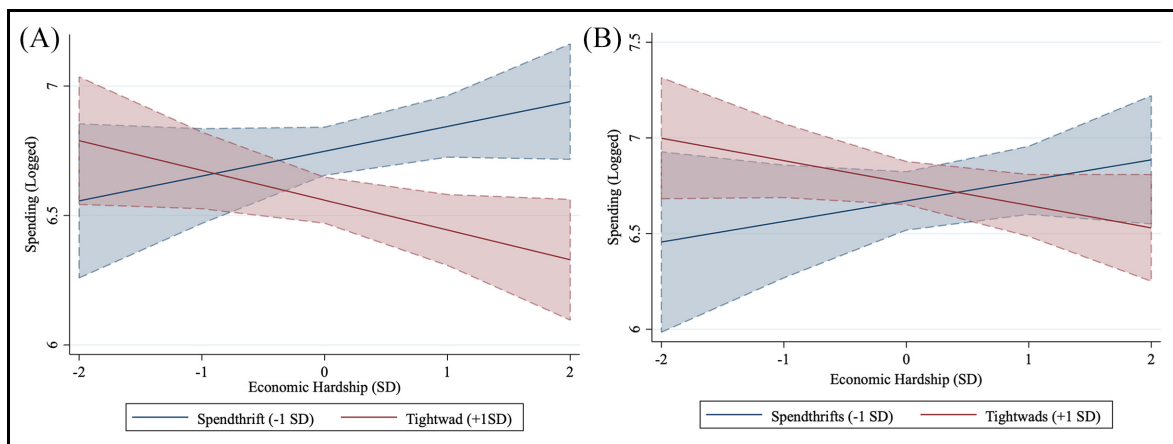


Figure 1. (A) Interaction Between Tightwadism and Economic Hardship on Spending Intentions (Study 1; Time 1). (B) Interaction Between Tightwadism and Economic Hardship on Spending Intentions (Study 1; Time 2)

Note. Error bands represent 95% confidence intervals.

Economic Hardship. Economic hardship was measured using a single item, “How satisfied or dissatisfied are you about the total amount of income available to your household?,” with responses on a Likert-type scale ranging from 1 = *very dissatisfied* to 5 = *very satisfied*; $M = 3.48$; $SD = 0.91$. This measure was reverse-scored and standardized to provide a measure of economic hardship.

Changes in Consumer Spending Intentions. This study measured consumer spending intentions using four items. Each item asked participants to indicate their intention to spend money on different categories (clothing and accessories; eating out; leisure; daily groceries) in the next 6 months compared with their current spending level (“Compared to what I do at the present, in the next 6 months I intend to spend money on . . .”). The responses were coded on a 7-point

Table 3. OLS Regression Model Predicting Monthly Spending at Time 2 From Time 1 Measures of Economic Hardship, Tightwadism, Their Interaction, Controlling for Time 1 Spending and Controls in Study 1 at Time 2

Variables	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Spending (T2)						
Spending (T1)	.60***	0.06	.60***	0.06	0.50***	0.06
Economic Hardship (a)	−0.10 [†]	0.05	−0.08	0.05	0.05	0.05
Tightwadism (b)	−0.00	0.05	0.03	0.05	0.00	0.07
Interaction (a × b)			−0.12*	0.05	−0.11*	0.05
<i>Controls</i>						
Age					0.00	0.00
Sex (female)					0.08	0.08
Relationship status (married)						
Separated/divorced					−0.13	0.14
Widowed					0.61*	0.29
Single					−0.03	0.11
Employment (full time)						
Part time					0.00	0.11
Not employed					−0.07	0.12
Student					−0.23	0.16
Retired					0.21	0.17
Education (college degree)						
High school					0.06	0.13
Some college					−0.03	0.08
Masters (or higher)					0.01	0.16
Income (household)					0.11***	0.02
Constant	6.74***	0.05	6.74***	0.05	3.00***	0.51
Observations	350		350		339	

Note. Indicator variables for responses “I prefer to skip this question” not shown.

[†] $p < .1$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Available Measures for Surveys Used in Study 2

Dataset	Variable	2010				2011				2012			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
LISS	STTW	—	—	✓	—	—	—	—	—	—	—	—	—
TILCOM	Econ Hardship	—	—	✓	✓	✓	✓	✓	✓	—	—	—	—
TILCOM	Spending	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note. LISS = Longitudinal Internet Studies for the Social Sciences; STTW = spendthrift-tightwad; TILCOM = Tilburg Consumer Outlook Monitor.

scale ranging from -3 (*I would reduce spending much more so*) to $+3$ (*I would reduce spending much less so*). The items showed a high reliability ($\alpha = .88$). Only participants who reported a change in their consumption were included in the analysis.

Results

Correlations and descriptive statistics are presented in Table 5. A multilevel mixed-effects regression model with responses nested within participants was used to test the hypotheses. The model controlled for age, sex, and wave of survey response. Table 6 reports the regression coefficients for each predictor. As hypothesized, economic hardship

was negatively associated with spending intentions ($B_{\text{hardship}} = -0.32$, $SE = .01$, $z = -28.62$, $p < .001$, 95% CI $[-0.34, -0.30]$), indicating that participants who experienced more hardship intended to spend less money on different categories. Moreover, there was a significant interaction between economic hardship and tightwadism (without controls $B_{\text{interaction}} = -.04$, $SE = .02$, $z = -2.52$, $p = .012$, 95% CI $[-0.07, -0.01]$; with controls $B_{\text{interaction}} = -.04$, $SE = .02$, $z = -2.41$, $p = .016$, 95% CI $[-0.07, -0.01]$), suggesting that the effect of hardship on spending intentions was moderated by the pain of paying. Figure 2 illustrates this interaction: The negative effect of hardship on spending intentions was stronger for tightwads than for spendthrifts.

Table 5. Means and Pairwise Correlations for Variables Used in Study 2

Variables	M	SD	1	2	3	4	5
1. Economic Hardship (STD)	0.00	1.00	—				
2. Tightwadism (STD)	-0.00	0.66	-.05***	—			
3. Spending (STD)	0.00	1.00	-.41***	-.09***	—		
4. Age	52.49	16.65	-.06***	.23***	-.22***	—	
5. Sex (female)	0.56	0.5	-.01	-.06***	-.06***	-.08***	—

[†] $p < .1$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6. OLS Regression Model Predicting (Planned) Spending From Economic Hardship, Tightwadism, Their Interaction and Controls in Study 2

Variables	Model 1		Model 2		Model 3	
	b	SE	B	SE	b	SE
Spending						
Economic Hardship (a)	-0.32***	0.01	-0.32***	0.01	-0.33***	0.01
Tightwadism (b)	-0.15***	0.02	-0.14***	0.02	-0.07**	0.02
Interaction (a × b)			-0.04*	0.02	-0.04*	0.02
Controls						
Age					-0.01***	0.00
Sex (female)					-0.18***	0.03
Constant	0.16***	0.01	0.16***	0.01	0.99***	0.05
Observations	7,301		7,301		7,272	
Participants	3,199		3,199		3,181	

Note. Indicator variables for each time period (1–6) not shown.

[†] $p < .1$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Due to the low reliability of the STTW scale in this study, we also conducted a robustness check in which we removed items from the scale that increased the internal reliability of the scale. This process results in a two-item scale that had a reliability of $\alpha = .64$. Using this scale, we repeated our analyses and replicated the significant interaction effect ($B_{\text{interaction}} = .04$, $SE = .01$, $z = 3.07$, $p = .002$).

Study 3: Cross-National Survey

The purpose of Study 3 was to test the main hypothesis using a cross-cultural dataset from 13 countries. A large European retail bank conducted a survey in 2013 that measured respondents' personal experience and economic hardship during the recent recession, their willingness to spend following the recession, the extent to which they have cut back on spending recently, and their STTW score.

Method

Participants. The sample consisted of 11,972 participants from 13 countries ($M_{\text{age}} = 44.24$, Female = 50.9%; see SOM 2 for breakdown of countries). The cross-sectional survey was representative of the overall population of each country in terms of its socio-demographics. It included

questions covering financial behavior, as well as several demographic and socio-economic variables, including age, gender, income, relationship status, and employment status.

Measures

STTW Scale. All four items were measured from the STTW scale. Items were standardized and averaged. Figure 3 presents a spider plot of the scores by country.

The internal reliability of the scale was low across countries ($\alpha = .37$), possibly due to the challenge of translating survey items into different languages. See SOM 4 for country-specific α values and additional analyses. Despite the low α values, we found that (a) spending intentions were significantly correlated with the tightwad scale in each country, (b) excluding countries with the lowest alpha values did not alter our results, and (c) using a more reliable scale also yielded consistent results.

Willingness to Spend Following Financial Crisis. Participants were asked whether they agreed with the statement: "I am more reluctant to spend money since the global financial crisis." Responses ranged from 1 = strongly disagree to 4 = strongly agree; $M = 2.77$, $SD = 0.82$. This item was reversed to provide a measure of willingness to spend.

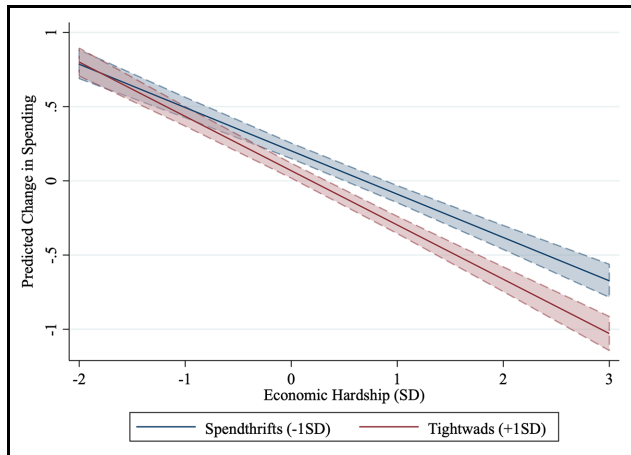


Figure 2. Interaction Between Tightwadism and Economic Hardship on Predicted Change in Spending (Study 2)

Note. Error bands represent 95% confidence intervals.

Cutting Back on Spending Categories. Participants were also asked whether they had cut-back on a series of different spending categories. These were: transport (19.89%); food (27.97%); housing—furnishings and maintenance costs (26.51%); housing—paying mortgage or rent (4.59%); utility bills—for example, gas, electricity, water (17.28%); phone, mobile phone and/or internet (23.92%); leisure and/or entertainment—for example, cinema, dining out (51.25%); clothing and grooming—for example, hairdresser (45.95%); health—for example, medical insurance, dental expenses, doctor’s appointments (14.90%); education (5.12%); holiday (43.02%); voluntary private savings for retirement (10.83%); other (1.02%). We created a variable indicating the number of categories that participants had cut back on and used this as another dependent variable. The mean number of categories participants had cut back on was 2.92 ($SD = 2.59$).

Negative Experience of Financial Crisis. Participants were asked: “How has the current economic situation affected your finances during the past 3 years?” (5 = *It improved greatly* to 1 = *It deteriorated greatly*). This scale was reverse-scored; $M = 3.39$, $SD = 0.85$.

Economic Hardship. Participants were asked to what extent they agreed or disagreed with the following statements: (a) “I am worried about my financial situation.” and (b) “I am able to pay my expenses easily.” (reverse coded). Responses ranged from 4 = *strongly agree* to 1 = *strongly disagree*. The items were averaged; $M = 4.85$, $SD = 1.75$.

The economic hardship measure was moderately correlated with the “Negative Experience of Financial Crisis” measure ($r = .42$), suggesting the two are related. However, given that one measure addresses participant’s

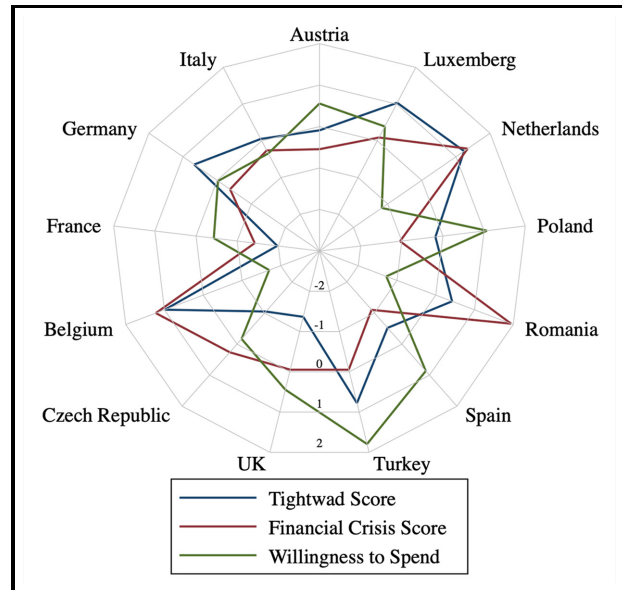


Figure 3. Spider Plot of Standardized (Across-Country) Tightwad Score, Negative Experience of Financial Crisis and Willingness to Spend by Country in Study 3

response to a financial crisis and the other to economic hardship or generally, we report results for the measures separately.

Control Variables. We included participants’ age, gender (0 = male, 1 = female), relationship status (0 = not in a couple, 1 = in a couple) and monthly income (euro, €) as covariates. We also included employment status using a categorical variable: full-time, 30 hours or more per week [reference group]; part-time, 8 to 29 hours per week (3); self-employed; student; retired; or not in employment.

Results

We examined how negative experiences of the financial crisis and perceived economic hardship influenced people’s willingness to spend. We expected that spending would be lower among those who suffered more from the crisis. To test this hypothesis, we conducted a linear regression analysis with willingness to spend as the dependent variable and negative experience of financial crisis, economic hardship, tightwadism, and demographic variables as independent variables. We used data from 121 regions across 13 countries and clustered the standard errors at the regional level⁴. Table 7 shows the means and correlations of all variables. Table 8 reports the regression results. As predicted, both negative experience of financial crisis ($B_{\text{negative experience}} = -.23$, $SE = .01$, $t = -18.83$, $p < .001$, 95% CI $[-0.26, -.21]$) and economic hardship ($B_{\text{economic hardship}} = -.29$, $SE = .02$, $t = -19.37$, $p < .001$,

Table 7. Means and Pairwise Correlations for Variables Used in Study 3

Variables	M	SD	1	2	3	4	5	6	7	8
1. Economic hardship	0.05	0.94	—							
2. Negative experience	0.00	1.00	.42***	—						
3. Tightwadism	0.00	0.59	.02*	.09***	—					
4. Willingness to spend	-0.01	1.00	-.29***	-.25***	-.23***	—				
5. Cut back spending	2.99	2.60	.50***	.47***	.11***	-.35***	—			
6. Income	2.24	1.98	-.14***	-.08***	-.01	.07***	-.12***	—		
7. Age	44.65	15.08	-.01	.16***	.09***	-.09***	.02	.05***	—	
8. Sex (female)	1.50	0.50	.10***	.11***	-.01	-.05***	.10***	-.05***	.01	—
9. Relationship (in couple)	0.70	0.46	-.07***	-.04***	.01	.01	-.04***	.11***	.11***	-.04***

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

Table 8. OLS Regression Model Predicting Reluctance to Spend From Economic Hardship, Tightwadism, Their Interaction and Controls in Study 3

Variables	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Willingness to spend						
Economic Hardship (a)	-.029***	0.02	-.029***	0.02	-.028***	0.02
Tightwadism (b)	-.039***	0.02	-.038***	0.02	-.037***	0.02
Interaction (a × b)			-.004*	0.02	-.004*	0.02
Controls						
Age					-.000***	0.00
Sex (female)					-.005*	0.02
Employment (full time)						
Part time					0.07 [†]	0.04
Not employed					0.02	0.04
Student					0.15***	0.04
Retired					-.002	0.03
Relationship (single)						
In a couple					0.00	0.02
Income (monthly)					0.02**	0.01
Constant	0.01	0.03	0.01	0.03	0.22***	0.05
Observations	11,972		11,972		11,972	

[†] $p < .1$. * $p < .05$. ** $p < .01$. *** $p < .001$.

95% CI [-0.32, -0.26]) were negatively associated with willingness to spend.

We hypothesized that reductions in spending caused by experiencing economic hardship should be amplified among those who find spending more painful (tightwads).

Supporting this hypothesis, we found significant interactions between tightwadism and both negative experience of financial crisis (without controls $B_{\text{interaction}} = -.05$, $SE = .02$, $t = -2.90$, $p = .004$, 95% CI [-0.09, -0.02]; with controls $B_{\text{interaction}} = -.05$, $SE = .02$, $t = -2.76$, $p = .007$, 95% CI [-0.09, -0.01]) and economic hardship (without controls $B_{\text{interaction}} = -.04$, $SE = .02$, $t = -2.30$, $p = .023$, 95% CI [-0.08, -0.01]; with controls $B_{\text{interaction}} = -.02$, $SE = .02$, $t = -2.15$, $p = .034$, 95% CI [-0.08, -0.00]), indicating that these effects were stronger for tightwads than for spendthrifts.

To illustrate this relationship, we plot spending by negative experience of financial crisis and tightwadism in Figure

4. The figure shows that, when respondents had been positively impacted by the financial crisis (low numbers on the x axis), tightwads were only slightly less likely to spend than spendthrifts (Figure 4A). However, for those who had been negatively impacted the difference between spendthrifts and tightwads grew larger. In other words, tightwads report planning to reduce their spending to a greater extent following an economic downturn, even after controlling for their income, employment status, and demographics. The same pattern is then also seen for economic hardship (Figure 4B).

We repeated these models using the categories of reduced spending as the dependent variable. We again find support for our hypothesis, with a significant interaction between tightwadism and both negative experience of financial crisis ($B_{\text{negative experience}} = 1.19$, $SE = .04$, $t = 32.42$, $p < .001$, 95% CI [1.12, 1.27]) and economic hardship ($B_{\text{economic hardship}} = 1.27$, $SE = .03$, $t = 40.93$, $p < .001$, 95% CI [1.21, 1.33]). As an additional robustness

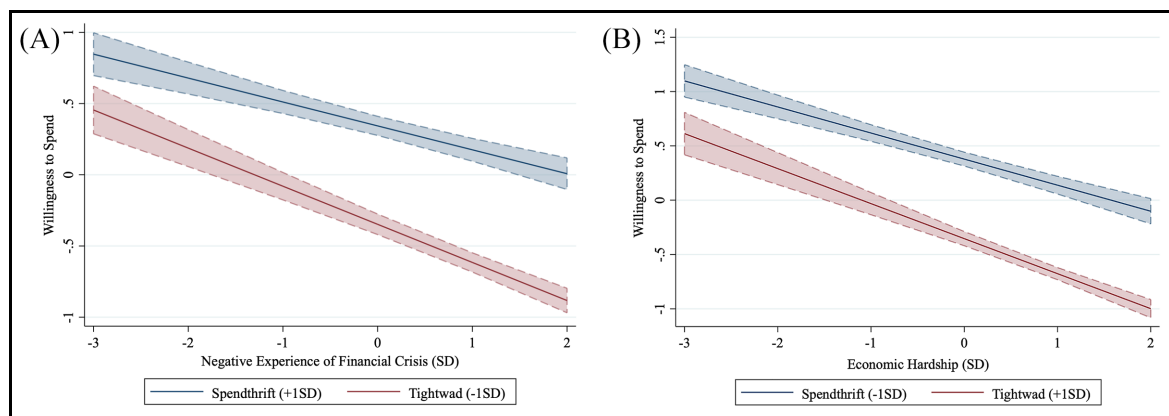


Figure 4. (A) Interaction Between Tightwadism and Negative Experience of the Financial Crisis on Willingness to Spend (Study 3). (B) Interaction Between Tightwadism and Economic Hardship and Willingness to Spend (Study 3)

Note. Error bands represent 95% confidence intervals.

check, we also ran ordinal logistic regression models, which confirmed the results from the OLS models for negative experience of financial crisis (without controls, $B_{\text{interaction}} = .23$, $SE = .04$, $t = 6.24$, $p < .001$, 95% CI [0.16, 0.31]; with controls, $B_{\text{interaction}} = .22$, $SE = .04$, $t = 5.93$, $p < .001$, 95% CI [0.15, 0.29]) and for economic hardship (without controls $B_{\text{interaction}} = .18$, $SE = .05$, $t = 3.66$, $p < .001$, 95% CI [0.08, 0.28]; $B_{\text{interaction}} = .17$, $SE = .05$, $t = 3.44$, $p = .001$, 95% CI [0.07, 0.27]).

Due to the low reliability of the STTW scale in this study, we repeat the robustness check used in Study 2, where we removed items so as to increase the internal reliability of the scale. This process results in a two-item scale that had a reliability of $\alpha = .51$. We then replicated our analyses using this scale and found consistent support for our hypotheses when using negative experience of financial crisis as the independent variable ($B_{\text{interaction}} = -.07$, $SE = .01$, $z = -5.62$, $p < .001$) and when using economic hardship ($B_{\text{interaction}} = -.08$, $SE = .01$, $z = -5.45$, $p < .001$).

General Discussion

We report research investigating the personality-based heterogeneity in consumer responses to economic hardship. Although there has been significant prior scholarship on the *economic* factors that might prolong recessions (De Nardi et al., 2011; Hall, 1993; Mody et al., 2012), this article proposed one *psychological* factor that might impact spending in response to economic hardships and recession; the extent to which individuals experience a “pain of paying” (Rick et al., 2007). Three studies support this claim, providing evidence that the extent to which individuals experience pain when paying has a multiplicative effect on spending in response a recession and financial distress more broadly. This research contributes to our understanding of the role that psychological traits can play in shaping consumption (Ebert et al., 2021; Gladstone et al., 2022; Weston et al., 2019), extending this to consider how

personality can influence responses to economic hardship and recession (Gerhard et al., 2018; Gladstone et al., 2021; Matz & Gladstone, 2020). In addition, the results highlight the critical role of personality in explaining why consumer spending declines in response to a recession, opening the door to psychological based macro-economic interventions.

This article extends our theoretical understanding of the “pain of paying,” demonstrating that individuals do not just differ on their absolute experience of pain (Zellermayer, 1996) but also in their sensitivity to external sources of pain; that is, a personality-environment interaction. Intriguingly, this suggests a similarity with physiological models of pain *sensitivity* (Nielsen et al., 2009). In other words, it is not only that tightwads feel more pain when making a specific purchase, as proposed by Zellermayer (1996), but based on the current results it appears that they are also more sensitive to changes in external factors (i.e., economic conditions) related to spending.

The concept of expense neglect has been well-documented in previous research. Berman et al. (2016) proposed an attention-based explanation for this phenomenon and demonstrated how tightwads, individuals who are more cost-sensitive, are less prone to expense neglect during periods of financial slack. The current study builds upon this research by examining how the spending behavior of tightwads and spendthrifts is affected by pain-of-paying during times of economic hardship. The results suggest that tightwads, due to their heightened sensitivity to costs, exhibit a greater reduction in spending compared with spendthrifts when faced with economic distress. These findings support the notion that individual personality traits can play a critical role in shaping economic decision-making and emphasize the importance of understanding the psychological mechanisms underlying consumption behaviors.

These results also provide new research directions and approaches for governments to tackle the reduced consumer spending that follows times of economic hardship. Given that past research has identified methods to make

spending less painful, such as paying using credit cards rather than cash (Knutson et al., 2007), the current research suggests that incentivizing these methods could be particularly important during recessionary periods where governments want to boost spending. Supporting this approach, there is evidence that tightwads are particularly responsive to interventions to reduce the pain of paying (Rick, 2018), and therefore it is possible that policymakers could target interventions to specific subsets of the population (i.e., tightwads) without inadvertently encouraging spendthrifts to engage in spending beyond their means. Recent approaches to predicting personality traits automatically from transaction data (Gladstone et al., 2019; Tovanich et al., 2021) offer one potential opportunity to segment the population without requiring widespread survey participation.

An interesting finding that warrants future research is the degree of variability in the interaction between spending pain and spending seen across studies. Although the presence of the interaction was detected in all studies, the response of spendthrifts varied. Notably, in Study 1 (Figure 1A and B) spendthrifts appear to increase spending in response to economic hardship, whereas in Studies 2 and 3, spendthrifts reduce spending. This suggests the presence of potentially important moderating factors that require further investigation. Such factors may include disparities in the culture of the samples studied, differences in study methodologies, and external economic factors not captured in our regression models. By exploring these factors, future research can provide a more nuanced understanding of the complex interplay between personality traits and consumer behavior in the context of economic hardship.

Finally, it is important to consider our findings in the light of the studies' strengths and weaknesses. A primary strength of the research is that we show the moderating effect of economic hardship on the relationship between the pain of paying with consumption attitudes and behaviors replicates across different samples, measures, and methodologies. These include primary data from online panels (Study 1), nationally representative samples (Study 2) and cross-national surveys (Study 3). Importantly, each of these approaches has their own limitations—such as sampling from non-representative populations, and translation of measures across different countries—however, the triangulation of results across each of these methods provides increased confidence in the article's conclusions.

One major limitation of the studies presented is their correlational nature. Although we do provide evidence using longitudinal data, there remain many potential confounds. In a study presented in the online supplement (SOM 5), we present a lab experiment ($N = 504$) to test the causal attributions of our hypothesis for different types of purchases. Although this study benefits from randomizing participants into conditions of financial hardship, the approach lacks ecological validity, and we found the hypothesized interaction for only one of the two spending outcome variables.

A further limitation of our research is the low internal reliability of the STTW scale in Studies 2 and 3. This may be in part attributable to the cross-cultural nature of the data, requiring the scale to be translated into many different languages. We discuss and address this issue empirically in SOM 6. We hope to encourage future scholars to consider developing more psychometrically rigorous measures of the pain of paying, including validating translated versions of the scale.

To conclude, economic hardship is an inherent feature of the economy, as it operates in a cyclical pattern of boom and bust (De Nardi et al., 2011; Hall, 1993). However, the degree to which consumers reduce their consumption will influence the longevity of a recessionary period (Keynes, 1933). This research contributes to our understanding of the pain of paying by proposing a novel explanation based on personality traits, which sheds light on why certain individuals exhibit greater sensitivity to this pain and, therefore, change their spending more significantly, potentially prolonging economic downturns. These findings offer valuable insights for researchers and policymakers, as they suggest the potential for personality-based interventions aimed at stimulating economic spending during periods of recession.

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Data Accessibility Statement

All data and syntax for analysis is available at our OSF Page: <https://osf.io/395yt/>

Supplemental Material

The supplemental material is available in the online version of the article.

Note

1. Results from analyses without winsorizing spending are consistent with those reported.

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