Journal of Personality and Social Psychology:
Personality Processes and Individual Differences

© 2025 American Psychological Association
ISSN: 0022-3514

2025, Vol. 128, No. 1, 147–195
https://doi.org/10.1037/pspp0000530

A Glass Half Full of Money: Dispositional Optimism and Wealth Accumulation Across the Income Spectrum

Joe J. Gladstone[1] and Justin Pomerance[2]
[1] Marketing Division, Leeds School of Business, University of Colorado Boulder
[2] Marketing Division, Paul College of Business and Economics, University of New Hampshire

What drives some people to save more effectively for their future than others? This multistudy investigation ($N = 143{,}461$) explores how dispositional optimism—the generalized tendency to hold positive expectations about the future—shapes individuals' financial decisions and outcomes. Leveraging both cross-sectional and longitudinal designs across several countries, our findings reveal that optimism significantly predicts greater savings over time, even when controlling for various demographic, psychological, and financial covariates. Furthermore, we find that the role of optimism varies based on socioeconomic circumstances: Among lower income individuals, optimism is more strongly associated with saving. This suggests optimism may be particularly beneficial for the financial well-being of economically disadvantaged populations. To ensure the robustness of our conclusions, we employ diverse methodological approaches, including cross-sectional and longitudinal data sets, objective measures of saving behavior to reduce self-report bias, and within-person analyses to control for stable individual differences. These findings suggest that interventions and policies aimed at fostering optimism may be an effective approach to promoting savings and building financial resilience, especially among economically vulnerable populations. More broadly, our work underscores the value of integrating psychological factors into economic models of saving behavior to develop a more comprehensive understanding of how people make financial decisions in the real world.

Keywords: optimism, savings, wealth, personal finance

Supplemental materials: https://doi.org/10.1037/pspp0000530.supp

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

The intrinsic unpredictability of life means that individuals depend on their expectations for the future when making financial choices. Just as weather forecasts guide our decision to carry an umbrella, economic projections shape our propensity to save or spend. Saving money is a key strategy for coping with uncertainty, serving as a buffer against unexpected expenses, a source of security in unpredictable circumstances, and a means of supporting long-term goals (Deaton, 1989; Haushofer & Fehr, 2014; Karlan et al., 2014; Mani et al., 2013; Shah et al., 2012). While existing research has examined many psychological factors underlying saving behavior, the role of dispositional optimism—the generalized tendency to hold positive expectations about the future (Carver et al., 2010)—remains understudied. Given that saving requires prioritizing the future over the present, understanding the role of dispositional optimism, a future-oriented characteristic, is particularly important. The present research investigates the relationship between dispositional optimism and saving behavior, and how this relationship varies based on socioeconomic circumstances.

The relationship between optimism and saving behavior is more complex than it may initially appear. On one hand, optimists' positive expectations and superior goal-pursuit skills (Armor & Taylor, 1998; Scheier & Carver, 1992) could facilitate saving behavior. Individuals with an optimistic outlook may be more likely to set ambitious long-term financial goals and more likely to persist in their efforts to achieve them. On the other hand, optimism may diminish the perceived need to save (Steinhart & Jiang, 2019). If optimists expect a better financial future, they may be less motivated to save for emergencies or unexpected expenses. Given these competing possibilities—and the possibility that they may operate simultaneously—our first objective is to investigate whether dispositional optimism promotes or inhibits savings overall.

Our second objective is to investigate whether income moderates the relationship between optimism and saving. While higher income households have relatively secure access to financial institutions, and often save automatically (e.g., through mortgage payments or unspent income), lower income households face unique psychological, social, and institutional challenges to saving (Katona, 1975; Mullainathan & Shafir, 2009; Shah et al., 2012). Optimism may thus be more influential for low-income households, particularly given its role in facilitating motivation and coping (Carver et al., 1993; Nes & Segerstrom, 2006). By exploring how income moderates the link between optimism and saving, we aim to identify specific psychological and behavioral factors that could be targeted to

Wiebke Bleidorn served as action editor.
Joe J. Gladstone https://orcid.org/0000-0002-8783-3923
Justin Pomerance https://orcid.org/0000-0003-1374-5450
Joe J. Gladstone played a lead role in data curation, formal analysis, and visualization and an equal role in writing–original draft and writing–review and editing. Justin Pomerance played a supporting role in conceptualization and formal analysis and an equal role in writing–original draft and writing–review and editing.
Correspondence concerning this article should be addressed to Joe J. Gladstone, Marketing Division, Leeds School of Business, University of Colorado Boulder, 995 Regent Drive, Boulder, CO 80309, United States. Email: Joe.Gladstone@Colorado.edu

enhance financial decision making among economically vulnerable populations.

The Paradoxical Effects of Optimism on Saving: Competing Theoretical Perspectives

Dispositional optimism, the generalized tendency to hold positive expectations about one's future (Carver et al., 2010; Scheier & Carver, 1985), has long been recognized as an adaptive characteristic that facilitates goal-pursuit and self-regulation (Carver & Scheier, 2014; Scheier & Carver, 1985). Distinct from specific forms of optimism tied to particular outcomes (Chang et al., 2009; Purol & Chopik, 2021), dispositional optimism captures a broad, overarching outlook on life that can shape motivation and decision making across domains (Carver & Scheier, 2014). However, emerging evidence suggests that in the domain of financial decision making, particularly saving money for the future, optimism may be a double-edged sword. The same cognitive and affective processes that typically render optimism advantageous—positive outcome expectancies and anticipatory savoring of future success—may also downplay the need to save for a rainy day. Thus, the relationship between dispositional optimism and financial behavior, particularly saving money, is consequential yet theoretically ambiguous.

Carver and Scheier's (1998) self-regulation model provides one framework for understanding how optimism might facilitate saving behavior. This model suggests that individuals' expectations about their ability to achieve desired outcomes play a crucial role in shaping motivation and persistence when faced with challenges. Optimists, characterized by their generalized positive expectancies, are more likely to view savings goals as attainable and maintain goal-directed behavior even in the face of setbacks (Carver et al., 2010). This positive self-efficacy belief may lead optimists to engage in proactive saving behaviors, such as budgeting and long-term financial planning, mirroring the beneficial effects of optimism observed in other self-regulatory domains like health (Carver & Scheier, 2014; Rasmussen et al., 2009). The model suggests that optimists' belief in their ability to overcome obstacles and achieve financial goals could translate into more consistent and effective saving practices. In addition, the broaden-and-build theory of positive emotions (Fredrickson, 2001) complements this perspective, suggesting that the positive affect and resilience associated with optimism may enable individuals to consider a wider range of saving strategies and engage in more effective long-term financial planning.

In contrast, economic theories, such as the life cycle hypothesis (Modigliani & Brumberg, 1954) and the permanent income hypothesis (Friedman, 1957), suggest that optimists' positive future expectations may undermine their perceived need to save. These models argue that individuals make consumption and saving decisions based on their expected lifetime income, aiming to smooth consumption over the life course. From this perspective, optimists' positive expectations about future income may lead them to perceive a smaller future budget constraint, reducing their motivation to save in the present (Katona, 1975; Puri & Robinson, 2007). Anticipating a rosy economic future—steady employment, rising income, and strong investment returns—could lead optimists to neglect precautionary saving in the present (Bjuggren & Elert, 2019).

The net result of these cognitive-affective processes may be a form of myopic optimism, where positive long-term expectancies lead to the neglect of short-term behaviors, like saving money, that could help bring about those expected outcomes. Bernheim et al.'s (2015) work on present bias in retirement saving decisions lends further credence to the idea that individuals often struggle to translate abstract, psychologically distant goals into concrete near-term actions, a disconnect that dispositional optimism could exacerbate.

Recent work by Steinhart and Jiang (2019) adds another perspective on why optimism may undermine saving. The authors found that experimentally induced pessimism, triggered by self-threat, increased saving intentions, indicating that the gloomier predictions of pessimists may drive them to save more as a proactive coping strategy. However, it remains unclear whether the effects observed with induced pessimism reflect the natural variations in dispositional optimism, or whether these effects are larger than the potential positive effects of optimism on savings.

Ultimately, the net effect of dispositional optimism on saving behavior may depend on the relative size of these effects, or on the specific future expectancies at play in a given context (Armor & Taylor, 1998). Optimism's relationship with expectancies regarding one's *capacity* to save could drive a positive effect, while its relationship with expectancies regarding the *need* to save could drive a negative effect. The relative strength of these opposing pathways remains an open empirical question.

To address this question, we propose two competing subhypotheses regarding the relationship between dispositional optimism and saving behavior:

Hypothesis 1a: Individuals with higher dispositional optimism will exhibit lower savings accumulation over time.

Hypothesis 1b: Individuals with higher dispositional optimism will exhibit higher savings accumulation over time.

How Income Moderates the Optimism–Saving Relationship

The influence of dispositional optimism on saving behavior is likely to vary across the socioeconomic spectrum, reflecting the diverse social, psychological, and economic environments in which households operate. Higher income households are more likely to accumulate savings through passive, automatic mechanisms, such as regular retirement contributions, mortgage payments, and other forms of *contractual saving* (Katona, 1975). Once set in motion, these routine allocations require little ongoing decision making and should thus be less sensitive to factors like optimism. For instance, higher income individuals are more likely to own homes and make regular or even automatic retirement contributions (Ehrenfreund, 2015; Gallup, 2017; Goldstein & Vo, 2012; U.S. Census Bureau, 2021). In addition, high-income households are more likely to save simply because they do not spend all their income, engaging in what is known as *residual saving* (Katona, 1975). As Katona (1975, p. 230) noted, these types of saving are "fulfilled as a matter of routine requiring no new decisions," and thus are less likely to be significantly associated with optimism.

In contrast, lower income households face a different set of circumstances that may amplify the role of optimism in saving behavior. These households often confront more immediate financial pressures and have less access to automated saving mechanisms (Katona, 1975). For these households, saving thus more often takes the form of deliberate allocations of limited resources away from

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

immediate needs and toward future goals. This type of active, discretionary saving draws heavily on the very traits that optimism fosters—psychological resilience, coping and self-regulatory skills, and positive expectancies (Carver et al., 2010; Nes & Segerstrom, 2006).

The distinct psychosocial challenges associated with financial scarcity may further amplify the importance of optimism for saving among lower income households. As Mullainathan and Shafir (2009) argued, poverty strains cognitive bandwidth, depleting the mental resources needed for successful coping and long-term planning. According to these authors,

> People who are better off function in the midst of a system … designed to facilitate their decisions and improve their outcomes, [while] people who are less well off typically find themselves without easy recourse to such "aids" and often are confronted by obstacles—institutional, social, and psychological. (Mullainathan & Shafir, 2009, p. 122; see also Karlan et al., 2014)

Chronic financial stress, coupled with structural barriers like reduced access to financial services, can lead to short-sighted decision making that prioritizes immediate needs over future goals (Mullainathan & Shafir, 2009; Shah et al., 2012). In this context, the positive outlook and constructive coping strategies associated with optimism may play a crucial buffering role, enabling future-focused financial behaviors. In contrast, the financial cushion and institutional supports enjoyed by more affluent individuals may render such psychological resources less critical for saving.

Building upon the socioeconomic disparities in saving mechanisms and financial challenges, we posit that income plays a crucial moderating role in the relationship between optimism and saving behavior. This moderation manifests as a buffering interaction, where higher income levels are expected to diminish the influence of dispositional optimism on saving practices. This leads us to formulate our second hypothesis:

> *Hypothesis 2:* Income will moderate the relationship between dispositional optimism and saving behavior, such that the association between optimism and saving will be stronger among lower income individuals than higher income individuals.

Optimism and Pessimism: Distinct Dimensions or Opposite Poles?

A central question in the study of dispositional optimism is whether optimism and pessimism represent opposite poles of a single continuum, or two distinct dimensions (Chang et al., 1994, 1997; Peterson, 2000; Scheier et al., 2021). Traditionally, researchers have conceptualized optimism as a single bipolar continuum running from extreme pessimism to extreme optimism. This has guided the common practice of calculating a single optimism score by combining positively and negatively worded items from measures like the Life Orientation Test–Revised (LOT-R; Scheier et al., 1994).

However, factor analyses of the LOT-R and similar scales frequently yield two-factor solutions, with positively framed items (assessing optimism) loading on one factor and negatively framed items (assessing pessimism) loading on another (Chang et al., 1994, 1997; Herzberg et al., 2006; Marshall et al., 1992). Moreover, these optimism and pessimism factors often exhibit surprisingly weak correlations with each other (Herzberg et al., 2006; Peterson, 2000), suggesting they may capture separate traits.

Beyond factor structure, differential associations with key outcomes provide additional evidence for a two-factor model. Numerous studies have found that pessimism more strongly predicts negative affective states, physical health problems, and maladaptive coping than optimism (Chang et al., 1997; Grevenbrock, 2020; Robinson-Whelen et al., 1997; Tindle et al., 2009). A recent meta-analysis by Scheier et al. (2021) involving over 220,000 participants found that associations between pessimism and poor physical health significantly outweighed associations between optimism and good physical health.

These patterns suggest that optimism and pessimism may relate to savings behavior via distinct pathways. For example, pessimism's stronger links to negative affect and avoidant coping (Chang et al., 1997; Grevenbrock, 2020) could lead to greater neglect of future-oriented financial behaviors like saving. Alternatively, the gloomier expectations characteristic of pessimism could amplify precautionary saving motives more powerfully than optimism attenuates them (Steinhart & Jiang, 2019). Comparing the predictive power of optimism and pessimism for saving could thus provide a more detailed understanding of the psychological mechanisms linking optimism and financial behavior.

To shed light on the potentially distinct roles of optimism and pessimism in shaping saving behavior, the current research employs a two-pronged approach. First, we examine the associations between dispositional optimism scores and saving outcomes, treating optimism as a one-factor, bipolar construct. Second, we conduct supplementary analyses by separating the LOT-R into its optimism and pessimism subscores. We then analyze how these subscores independently correlate with each saving outcome. By comparing the magnitude and direction of correlation coefficients between the overall optimism score and the separate subscores for each saving outcome, we can determine whether optimism and pessimism have equivalent but opposite effects on saving behavior, or if one facet has a stronger influence. For instance, if the pessimism subscore shows a stronger correlation with saving outcomes than the correlation of the optimism subscore, it would suggest that reducing pessimism might be more effective in promoting saving behavior than increasing optimism. This approach will offer insights into both the structure of dispositional optimism and its real-world financial implications.

Addressing Confounds and Causal Pathways

Our investigation into the relationship between dispositional optimism and saving behavior necessitates a rigorous methodological approach to address potential confounds and strengthen causal inferences. This study employs a multifaceted strategy to mitigate biases and elucidate potential causal pathways.

First, we control for an extensive set of covariates known to influence both optimism and saving behavior (see Table 1). These include demographic factors (age, gender, relationship status, parental status, childhood socioeconomic status [SES]), health status, employment status, and the Big Five personality traits. For example, older individuals tend to be more optimistic (Schwaba et al., 2019) and have had more time to accumulate savings. Similarly, men report higher levels of optimism (Bjuggren & Elert, 2019; Garbarino & Strahilevitz, 2004; Jacobsen et al., 2014) and tend to hold more wealth. Detailed rationales for covariate inclusion are provided in the online Supplemental Materials A.

To further strengthen our analysis against unmeasured confounding, we utilize within-person longitudinal data analysis. This

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 1
Confounds Controlled for Across Studies

Measure	Study 1	2	3	4	5	6	7	8
Demographic confounds								
Age, Age^2	✓	✓	✓	✓	—	✓	✓	✓
Gender	✓	✓	✓	✓	✓	✓	✓	✓
Relationship status	✓	✓	✓	✓	✓	✓	✓	✓
Employed	✓	✓	✓	✓	✓	✓	✓	✓
Children	✓	✓	✓	✓	✓	✓	✓	✓
Health	—	✓	—	✓	✓	✓	✓	✓
Psychological confounds								
Big Five traits	✓	✓	✓	✓	—	—	—	✓
Childhood SES	—	✓	—	—	✓	—	—	—
Financial sophistication	✓	—	—	✓	—	—	—	—
Unobserved confounds								
Time-invariant	—	—	—	—	—	—	✓	✓

Note. This table summarizes the confounds controlled for across the eight studies. ✓ indicates that the variable was included as a control in the respective study. — indicates that the variable was not included due to data unavailability. Time-invariant refers to the use of fixed-effects models to control for unobserved time-invariant confounds. SES = socioeconomic status.

approach examines how intraindividual changes in optimism over time correlate with changes in saving behavior, effectively controlling for time-invariant individual differences (Curran & Bauer, 2011; Hoffman & Stawski, 2009).

While the primary objective of this study is to estimate the total effect of optimism on saving behavior, it is important to acknowledge the potential role of mediating variables. The literature has identified several factors as potential mediators, including future-orientation, self-regulation, coping styles, positive affect, risk tolerance, precautionary motives, financial self-efficacy, and time discounting (Bjuggren & Elert, 2019; Carver et al., 2010; Carver & Scheier, 2014; Kool & Botvinick, 2018; Nes & Segerstrom, 2006; Puri & Robinson, 2007; Steinhart & Jiang, 2019). Notably, this study does not control for these potential mediators in the primary analyses. This decision is grounded in methodological considerations: controlling for mediators would partial out their indirect effects, potentially leading to an underestimation of the total effect of optimism on saving behavior (Clarke, 2005; MacKinnon & Lamp, 2021; Pearl, 2009; Shadish et al., 2002).

Given the limitations of mediation analysis in observational data (Bullock et al., 2010; Rohrer, 2018), we focus on estimating the total effect of optimism on saving. This approach provides a robust foundation for future research to explore specific causal mechanisms through experimental designs or more advanced causal inference techniques. We believe that future investigations into the specific mechanisms through which optimism influences saving behavior would be extremely valuable. Additional details of our causal assumptions are discussed in online Supplemental Materials A.

Overview of Current Research

Our investigation into the relationship between dispositional optimism, income, and saving behavior employs a methodological strategy designed to address key theoretical and empirical challenges in the field. We utilize eight large-scale, nationally representative data sets spanning multiple countries, incorporating both cross-sectional and longitudinal designs (Table 2). This approach allows us to examine the optimism–saving relationship from various angles, enhancing the robustness and generalizability of our findings.

The inclusion of cross-sectional studies (1–3) provides snapshots of the optimism–saving association at specific time points, treating optimism as a stable individual difference. These studies offer insights into between-person variations and allow for the examination of potential moderating factors such as income. Complementing this, our longitudinal studies (4–8) enable the tracking of within-person changes in optimism and saving behavior over time. This design is particularly valuable for addressing the ongoing debate surrounding the temporal stability of dispositional optimism.

While personality traits generally stabilize during adolescence and young adulthood (Bleidorn et al., 2022), the trajectory of optimism across the lifespan remains contentious. Some research suggests an inverted U-shaped trajectory (Carver et al., 2010; Purol & Chopik, 2021), while others emphasize rank-order stability (Atienza et al., 2004). Our longitudinal approach allows us to disentangle these aspects, examining both the traitlike stability of optimism and its potential fluctuations in response to life events.

To further strengthen our analysis, we employ diverse measures of dispositional optimism across studies (Table 3). This includes established scales like the LOT-R and single-item assessments. This measurement diversity serves two crucial purposes. First, it allows us to examine the consistency of the optimism–saving relationship across different operationalizations of the construct, enhancing construct validity. Second, it enables us to investigate potential differences in how various aspects of optimism (e.g., general positivity vs. specific future expectations) relate to saving behavior.

Empirical Strategy

We employ a regression-based framework to test our hypotheses, implementing a three-tiered modeling strategy across all studies to enhance transparency and statistical validity. First, we conduct unadjusted models to assess the raw, bivariate association between optimism and saving behavior. This initial step provides a baseline understanding of the overall relationship, free from the influence of potential confounding factors. Second, we introduce a comprehensive set of control variables (detailed in Table 1) to isolate the unique effect of optimism on saving behavior. This adjusted model allows us to account for potential confounds and provides a more precise estimate of the optimism–saving relationship.

Third, to examine the hypothesized moderation effect of income on the optimism–saving relationship (Hypothesis 2), we employed income-moderated regression models. These models interact income with all covariates, including optimism, allowing their effects to vary across income levels. This approach captures how the optimism–saving relationship may differ along the income spectrum while accounting for income-dependent effects of other factors. Our strategy aligns with recent methodological recommendations to include interactions of controls in models with interactions, avoiding assumptions of linear or unconditional effects (Blackwell & Olson, 2022; Yzerbyt et al., 2004). However, we acknowledge the potential drawbacks of this approach, including increased model complexity, multicollinearity, and risk of overfitting (Babyak, 2004; Lever et al., 2016). Consequently, we interpret these results cautiously, not presuming their superiority over simpler models.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 2
Summary of Studies

Study no. and data set	*N*	Country	Design	Unique contribution
1 (U.K. consumer charity)	3,427	United Kingdom	CS	Nationally representative; Survey weights enhance generalizability
2 (Add health)	4,578	United States	CS	Single cohort (ages 24–32) controls for age effects; high internal validity; childhood SES control captures early life influences
3 (Retail Bank Data)	732	United Kingdom	CS	Objective financial data reduces self-report bias; direct comparison of self-reported versus bank-reported savings
4 (Wisconsin Long. Study)	9,802	United States	Long.	7-year follow-up; high-quality measures of both savings and net worth; detailed personality measures enable robust control for individual differences
5 (British Cohort Study)	7,043	United Kingdom	Long.	Tracks nationally representative cohort born in 1970; controls for cohort effects
6 (SHARE Europe)	19,741	14 countries	Long.	Multicountry design allows for cross-cultural comparisons; largest cross-national sample enhances generalizability across European contexts
7 (Understanding society)	51,325	United Kingdom	Long.	Within-person analyses control for time-invariant confounds; largest sample size increases statistical power; most diverse savings measures capture multiple aspects of saving behavior
8 (SOEP)	46,813	Germany	Long.	Within-person analyses; longest running panel (18 years); investment returns as savings proxy provides insight into wealth accumulation

Note. This table summarizes key characteristics of the eight studies. *N* represents the sample size for the model with the largest number of participants in each study. For Studies 7 and 8, *N* refers to unique participants, while the total number of observations are 97,425 and 82,944, respectively. Study designs are abbreviated as CS (cross-sectional) or Long. (Longitudinal). "Nationally representative" indicates a nationally representative sample. "Single cohort" refers to participants born in the same year. "Objective financial data" indicates the use of bank-reported rather than self-reported financial information. "Within-person analyses" refers to the use of fixed-effects models to examine changes within individuals over time. Unique Contributions summarizes the distinctive features or methodological strengths of each study. SHARE = Survey of Health, Ageing and Retirement in Europe; SOEP = socioeconomic panel; SES = socioeconomic status.

In our longitudinal analyses, we carefully navigate the methodological challenges inherent in studying temporal relationships. We deliberately avoid cross-lagged panel models (CLPMs) due to their well-documented limitations in distinguishing between-person differences from within-person changes (Hamaker et al., 2015). CLPMs often conflate these two levels of analysis, potentially leading to erroneous conclusions about causal relationships (Usami et al., 2019). Similarly, we exercise caution with lagged regression models, as they share fundamental assumptions with CLPMs and may fail to account for traitlike stability in constructs over time (Dormann & Griffin, 2015; Mund & Nestler, 2019). These models can struggle to effectively test potential associations between constructs at a latent stable-trait level, which is crucial for understanding the long-term relationship between optimism and saving behavior. Nevertheless, to ensure a comprehensive analysis, we have included supplementary lagged models in the online materials for readers interested in examining these different analytical strategies.

Table 3
Optimism Measures Used Across Studies

		Study							
Measure	Item	1	2	3	4	5	6	7	8
LOT-R	I am always optimistic about my future	✓	✓	—	✓	✓	—	—	—
Optimism subscale	Overall, I expect more good things to happen to me than bad	✓	✓	—	✓	—	—	—	—
	In uncertain times, I usually expect the best	—	✓	✓	✓	✓	—	—	—
	I pursue my goals with lots of energy	—	—	—	—	✓	—	—	—
	I still find ways to solve a problem if others have given up	—	—	—	—	✓	—	—	—
	Given my previous experiences I feel well prepared for my future	—	—	—	—	✓	—	—	—
LOT-R	I rarely count on good things happening to me	✓	✓	—	✓	✓	—	—	—
Pessimism subscale	I hardly ever expect things to go my way	✓	✓	—	✓	✓	—	—	—
	If something can go wrong for me, it will	—	✓	—	✓	—	—	—	—
Single-item measure	I have been feeling optimistic about the future	—	—	—	—	—	✓	✓	—
	When you think about the future, are you … [optimistic versus pessimistic]	—	—	—	—	—	—	—	✓

Note. This table summarizes the optimism measures used across the eight studies. ✓ indicates that the item was included in the study's optimism measure. — indicates that the item was not used. For the LOT-R scale, participants indicated their level of agreement with these statements on a 1–5 scale, where 1 = *strongly disagree* and 5 = *strongly agree*. For the single-item measures, Studies 6 and 7 used a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*), while Study 8 used a 4-point scale (1 = *pessimistic*, 4 = *optimistic*). In studies where both optimism and pessimism subscales were used, pessimism items were reverse-scored so that higher scores indicate greater optimism across all measures. LOT-R = Life Orientation Test–Revised.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Our analytical approach employs multiple complementary methods to address these challenges. We utilize cross-sectional models for each time point to capture contemporaneous relationships between variables and examine the effect of optimism on future savings levels to account for temporal precedence. For Studies 7 and 8, which involve the most waves of data, we employ fixed-effects models to isolate within-person effects, effectively controlling for time-invariant confounds (Allison, 2009). The specific implementation of these models is described in detail within the respective study sections.

Throughout our analyses, we prioritize transparency by reporting both significant and nonsignificant results. We conduct extensive sensitivity analyses to assess the robustness of our findings across different model specifications and subsamples. By implementing this multifaceted analytical strategy across diverse data sets, we aim to provide a comprehensive understanding of the role of optimism in shaping saving behavior across different socioeconomic contexts, while acknowledging the limitations inherent in observational data (Rohrer & Murayama, 2023).

Studies 1–3: Cross-Sectional Evidence

In Studies 1–3, we employ three cross-sectional data sets to investigate the relationships between optimism, income, and savings. Studies 1 and 2 utilize large, representative surveys to capture a broad spectrum of demographic and financial variables. Study 3 leverages real consumer transaction data, providing a more granular view of savings behavior by measuring both bank-reported savings and participants' self-reported estimates of their current savings. Such comparison may reveal potential discrepancies between perceived and actual saving behaviors, shedding light on the role of optimism in financial self-assessment.

While these cross-sectional studies provide valuable snapshots of the optimism–saving relationship, we acknowledge their inherent limitation in capturing temporal dynamics. Although previous research supports the relative stability of optimism over time (Atienza et al., 2004; Eid & Diener, 2004; Scheier et al., 1994; Schou et al., 2005), our cross-sectional approach necessarily assumes constancy in optimism levels. We address this limitation in our subsequent longitudinal studies, which allow for the examination of within-person changes and temporal precedence.

Study 1: Cross-Sectional Evidence From a U.K.-Based Charity Survey

Method

Data Set and Participants

The data for this study were collected from a unique household survey conducted in 2013 by a large independent charity in the United Kingdom. The survey was designed in collaboration with the first author and investigated the household savings behavior of 4,170 U.K. individuals. To ensure representativeness of the U.K. population, the survey was conducted online, via telephone, and in-person by a professional polling organization. The survey included questions on household savings, as well as several sociodemographic variables, including age, gender, income, and educational attainment. The order of the items in the survey was randomized to prevent any ordering effects.

Measures

Optimism. Participants' optimism levels were measured using the LOT-R (Scheier et al., 1994). This six-item scale assesses general optimism or pessimism. Responses were on a 5-point agreement scale (*I disagree a lot* to *I agree a lot*). The combined items showed a high level of internal reliability ($M = 3.09$, $SD = .84$, $\alpha = .85$). The specific item wording is detailed in Table 3. For consistency across studies, optimism scores were z-standardized ($M = 0$, $SD = 1$), with higher scores indicating increased optimism.

Savings. Savings was measured by asking "Which of the following best describes the total amount of savings your household has at the moment?" Participants indicated one of 16 bands (1 = nothing, 2 = less than £100, 3 = £100–£250, 4 = £251–£500, 5 = £501–£1,000, 6 = £1,001–£2,000, 7 = £2,001–£4,000, 8 = £4,001–£6,000, 9 = £6,001–£8,000, 10 = £8,001–£10,000, 11 = £10,001–£15,000, 12 = £15,001–£20,000, 13 = £20,001–£30,000, 14 = £30,001–£40,000, 15 = £40,001–£50,000, 16 = £50,000+). Responses of "don't know" or "prefer not to say" were treated as missing data. To align with subsequent studies using continuous savings measures, these categories were converted into continuous values using their midpoints (e.g., category 13 would be £25,000) and then log-transformed for the main analyses.

Income. Income was recorded using a list of 13 categories (1 = up to £7,000, 2 = £7,001–£14,000, 3 = £14,001–£21,000, 4 = £21,001–£28,000, 5 = £28,001–£34,000, 6 = £34,001–£41,000, 7 = £41,001–£48,000, 8 = £48,001–£55,000, 9 = £55,001–£62,000, 10 = £62,001–£69,000, 11 = £69,001–£76,000, 12 = £76,001–£83,000, 13 = £83,001 or more). The most common income bracket reported was "£14,001–£21,000" (18.64%).

Control Variables. Demographic controls (Table 4) included participants' gender, whether they had children (73%), and marital status (49% married or in civil partnership), and whether they were employed (54% were). The survey measured age categorically (3 = 18–24, 4 = 25–34, 5 = 35–44, 6 = 45–54, 7 = 55–64, 8 = 65+; $M = 5.81$), therefore, we do not include age^2 in this analysis.

The Big Five personality traits were assessed using a 15-item scale adapted from the British Household Panel Survey (Brown & Taylor, 2014; Cobb-Clark & Schurer, 2012). Due to a survey error, one item was unusable, resulting in a 14-item scale. Cronbach's alphas for the traits ranged from 0.56 to 0.77, with the exception of conscientiousness ($\alpha = .43$), which had only two items. While this reliability coefficient for conscientiousness appears low by traditional standards, previous research suggests that these alpha coefficients may underestimate the actual reliability of brief personality scales (Donnellan & Lucas, 2008; Lucas & Donnellan, 2011). Despite this limitation, we included the conscientiousness measure in our analyses, interpreting results with appropriate caution.

Participants rated their overall financial knowledge and ability to stay informed about financial news. We used this as a measure of financial literacy. The personality and financial literacy measures were standardized for analysis. Measures for health and childhood SES were not included in the survey and so unavailable for inclusion in the analyses.

Ethics Statement

This research exclusively utilizes preexisting, deidentified secondary data sets, thereby exempting it from the ethical review

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 4
Descriptive Statistics (Study 1)

Measure	*N*	*M*	*SD*	Min	Max
Savings (categories)	3,427	7.95	5.49	1	16
Savings amount (£)	3,427	14,463.13	18,716.45	0	50,000
Log savings amount	3,427	6.78	3.98	0	10.82
Income (categories)	3,819	4.39	2.43	1	13
Optimism	3,904	3.09	0.84	1	5
Age (categories)	4,170	5.81	1.67	3	8
Female	4,170	0.50	0.50	0	1
In relationship	4,145	0.49	0.50	0	1
Employed	4,170	0.54	0.50	0	1
Child	4,170	0.73	0.45	0	1
Extraversion	3,904	0.00	1.00	−3.74	1.63
Agreeableness	3,904	0.00	1.00	−3.93	2.93
Conscientiousness	3,904	0.00	1.00	−2.41	2.20
Neuroticism	3,904	0.00	1.00	−2.08	2.12
Openness	3,904	0.00	1.00	−3.24	1.86
Fin literacy	3,904	0.00	1.00	−2.81	1.99

Note. Savings (categories) represents 16 ordinal categories of savings amounts. Savings Amount is expressed in Great Britain Pounds (£), with Log Savings Amount being its natural logarithm transformation. Income (Categories) represents 13 ordinal categories of income levels. Optimism is measured on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Age (Categories) represents 6 age groups (3 = 18–24, 4 = 25–34, 5 = 35–44, 6 = 45–54, 7 = 55–64, 8 = 65+). Binary variables are coded as follows: Female (0 = male, 1 = female), In Relationship (0 = single, 1 = in a relationship), Employed (0 = unemployed, 1 = employed), and Child (0 = no children, 1 = has children). The Big Five personality traits (Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness) and Financial Literacy scores are standardized, with a mean of 0 and standard deviation of 1. *N* varies across variables due to missing data. Min = minimum value; Max = maximum value.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

requirements typically associated with human participant research, as per the guidelines set forth by the University of Colorado Office of Research Integrity (2019). Our approach ensures the protection of individual privacy and confidentiality, as we do not have access to any personally identifiable information.

Transparency and Openness

Sample size was determined by the available data. We report all data exclusions. The data set and analysis code are accessible via the Open Science Framework (OSF: https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6). This study was not preregistered.

Analytic Strategy

To test our hypotheses, we employed a series of regression models in Stata (Version 18). To test Hypothesis 1b (positive association between optimism and savings), we employed linear regression models with optimism as the predictor and log-transformed savings as the outcome. We ran both unadjusted models and models controlling for relevant covariates. To test Hypothesis 2 (stronger relationship for lower income individuals), we included an interaction term between optimism and income in our models. A significant negative interaction would support Hypothesis 2, indicating that the positive effect of optimism on savings decreases as income increases. We conducted several additional analyses to ensure the robustness of our findings. These included ordinal logistic regression to address potential nonlinearity in the savings measure, weighted analyses to enhance generalizability, and separate analyses of optimism and pessimism subscales to explore potential distinctions between these constructs. Throughout our analyses, we report both standardized and unstandardized coefficients, along with 95% confidence intervals, to facilitate interpretation and comparison of effect sizes.

Results

Associations Between Optimism and Savings

Our analysis revealed a significant positive association between optimism and savings, supporting Hypothesis 1b. Specifically, more optimistic individuals demonstrated higher savings amounts compared to less optimistic individuals, $b = 1.07$, $t(3, 425) = 16.52$, 95% CI [0.94, 1.19], $p < .001$, $\beta = .271$. This effect weakened but remained significant after adjusting for covariates, $b = .376$, $t(3, 404) = 5.79$, 95% CI [0.25, 0.50], $p < .001$, $\beta = .096$. Our regression analyses are summarized in Table 5. Figure 1 visually depicts the differences in savings as optimism increases.

Comparing Predictive Value of Optimism and Pessimism for Savings

To investigate the potentially distinct roles of optimism and pessimism in shaping saving behavior, we conducted an analysis using the LOT-R subscales. In this and all subsequent studies, pessimism items were reverse-scored to ensure comparability, with higher scores on both subscales indicating greater optimism. Both optimism and pessimism exhibited significant positive associations with savings (optimism items, $\beta = .143$, $p < .001$; pessimism items, $\beta = .164$, $p < .001$), indicating that higher levels of either trait corresponded with increased savings. A Wald test revealed no significant difference in the effect sizes of these subscales,

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 5

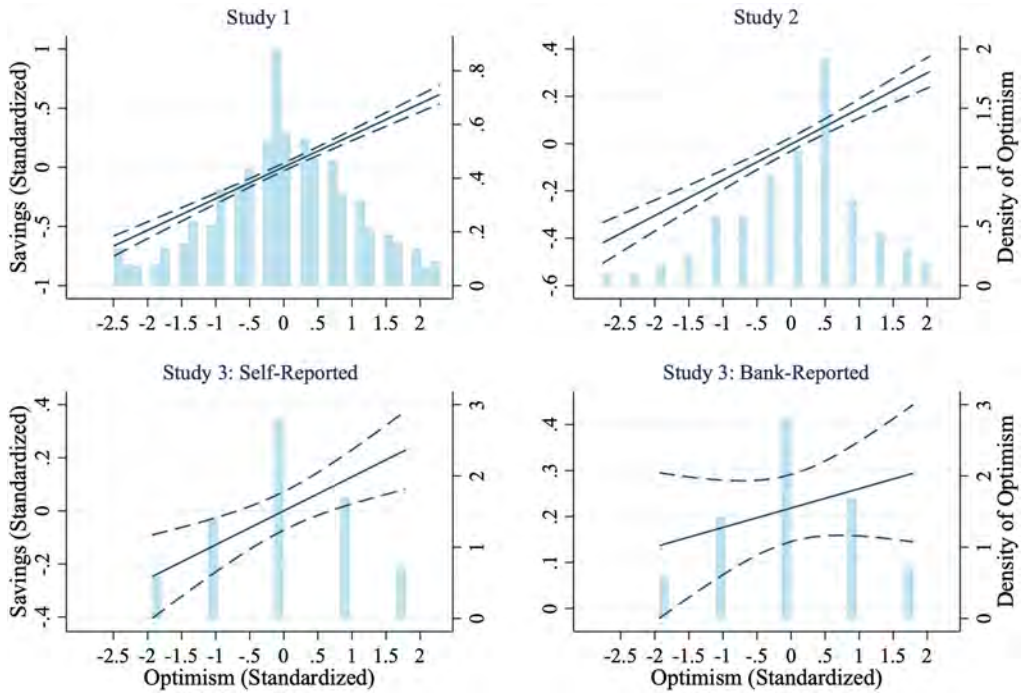
Results of OLS Regression Predicting Savings From Optimism, Income, Their Interaction, and Covariates (Study 1)

	(M1) Unadjusted baseline			(M2) Additive control			(M3) Unadjusted baseline			(M4) Additive control			(M5) Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**1.07**	**[0.94, 1.19]**	**<.001**	**0.38**	**[0.25, 0.50]**	**<.001**	**1.58**	**[1.30, 1.86]**	**<.001**	**0.80**	**[0.54, 1.05]**	**<.001**	**0.68**	**[0.39, 0.98]**	**<.001**
Income							**0.89**	**[0.71, 1.06]**	**<.001**	**0.68**	**[0.52, 0.84]**	**<.001**	**1.07**	**[0.82, 1.31]**	**<.001**
Optimism × Income							**−0.13**	**[0.18, −0.08]**	**<.001**	**−0.10**	**[−0.15, −0.06]**	**<.001**	**−0.07**	**[−0.13, −0.02]**	**.010**
Age				**0.50**	**[0.41, 0.58]**	**<.001**				**0.51**	**[0.43, 0.59]**	**<.001**	**0.71**	**[0.55, 0.87]**	**<.001**
Female				−0.10	[−0.33, 0.12]	.371				−0.03	[−0.26, 0.19]	.766	−0.05	[−0.49, 0.40]	.838
In relationship				**0.57**	**[0.35, 0.80]**	**<.001**				0.13	[−0.10, 0.36]	.270	0.16	[−0.30, 0.61]	.504
Employed				**0.55**	**[0.31, 0.79]**	**<.001**				0.04	[−0.21, 0.29]	.744	**0.57**	**[0.11, 1.04]**	**.016**
Child				**0.69**	**[0.43, 0.95]**	**<.001**				**0.83**	**[0.57, 1.10]**	**<.001**	**1.21**	**[0.68, 1.73]**	**<.001**
Extraversion				**−0.38**	**[−0.49, −0.27]**	**<.001**				**−0.31**	**[−0.42, −0.20]**	**<.001**	**−0.60**	**[−0.82, −0.38]**	**<.001**
Agreeableness				−0.09	[−0.20, 0.02]	.112				−0.09	[−0.20, 0.02]	.092	−0.07	[−0.29, 0.14]	.504
Conscientiousness				**−0.25**	**[−0.36, −0.13]**	**<.001**				**−0.27**	**[−0.39, −0.16]**	**<.001**	**−0.36**	**[−0.58, −0.13]**	**.002**
Neuroticism				0.07	[−0.06, 0.20]	.315				0.08	[−0.05, 0.21]	.210	0.14	[−0.11, 0.39]	.278
Openness				−0.09	[−0.21, 0.02]	.101				−0.07	[−0.18, 0.05]	.266	0.04	[−0.18, 0.27]	.711
Fin Literacy				**1.90**	**[1.78, 2.02]**	**<.001**				**1.69**	**[1.57, 1.82]**	**<.001**	**1.92**	**[1.70, 2.15]**	**<.001**
Age × Income													**−0.05**	**[−0.08, −0.02]**	**.001**
Female × Income													−0.00	[−0.08, 0.08]	.971
In Relationship × Income													−0.01	[0.10, 0.07]	.777
Employed × Income													**−0.15**	**[−0.24, −0.07]**	**.001**
Child × Income													−0.08	[−0.17, 0.01]	.067
Extraversion × Income													**0.07**	**[0.03, 0.10]**	**<.001**
Agreeableness × Income													−0.01	[−0.04, 0.03]	.772
Conscientiousness × Income													0.02	[−0.02, 0.06]	.340
Neuroticism × Income													−0.01	[−0.06, 0.03]	.597
Openness × Income													−0.02	[−0.06, 0.02]	.233
Fin Literacy × Income													**−0.06**	**[−0.10, −0.02]**	**.008**
Constant	**6.79**	**[6.67, 6.92]**	**<.001**	**2.86**	**[2.30, 3.42]**	**<.001**	−0.04	[−0.95, 0.86]	.927	−0.85	[−1.80, 0.10]	.079	**−2.27**	**[−3.56, −0.98]**	**.001**
Observations		3,427			3,417			3,302			3,295			3,295	
R^2		0.07			0.38			0.15			0.42			0.43	

Note. This table presents results from ordinary least squares (OLS) regression models predicting savings from optimism, income, their interaction, and covariates in Study 1. The dependent variable, savings amount, is log-transformed. Bolded values indicate statistical significance at $p < .05$. The sample size varies slightly across models due to missing data on some variables; M = model; CI = confidence interval.

Figure 1

Relationship Between Standardized Optimism and Savings Measures (Studies 1–3)



Note. Figure illustrates the relationship between standardized optimism scores and standardized savings across Studies 1–3. The solid lines indicate the trend of the relationship, with dashed lines representing 95% confidence intervals. Light blue bars depict the density distribution of optimism scores. Study 3 presents both self-reported and bank-reported savings data, with self-reported savings showing a stronger positive relationship with optimism compared to bank-reported savings. See the online article for the color version of this figure.

$F(1, 3424) = 0.38$, $p = .536$, suggesting comparable predictive power for both constructs.

Moderating Effect of Income

Our analysis revealed a significant interaction between income and optimism in predicting savings behaviors, supporting Hypothesis 2, Table 5, Model 3, $b = -0.13$, $t(3298) = -5.17$, 95% CI [−0.18, −0.08], $p < .001$, $\beta = -0.14$. This finding suggests that the relationship between optimism and savings varies depending on an individual's income level, with optimism having a stronger effect on savings for those with lower incomes.

To better understand this interaction, we examined the effect of optimism on savings at different income levels. For individuals in the £7,001–£14,000 income category, optimism was associated with significantly higher savings, $b = 1.10$, $t(3298) = 13.00$, 95% CI [0.93, 1.26], $p < .001$. In contrast, for those with high incomes (£76,001–£83,000), the effect of optimism on savings was negligible, $b = -0.013$, $t(3298) = -0.08$, 95% CI [−0.35, 0.32], $p = .937$. Figure 2 visually illustrates this interaction, demonstrating the diminishing effect of optimism on savings as income increases.

Importantly, the moderating effect of income remained significant even after controlling for relevant covariates, both as main effects (Table 5, Model 4, "additive controls") and as interactions with income (Table 5, Model 5, "full controls"), suggesting that the moderating effect of income is robust to potential confounding variables. A Likelihood Ratio Test comparing the two models revealed that including covariate–income interactions significantly improved model fit, $\chi^2(11) = 39.57$, $p < .001$.

Robustness Checks and Generalizability

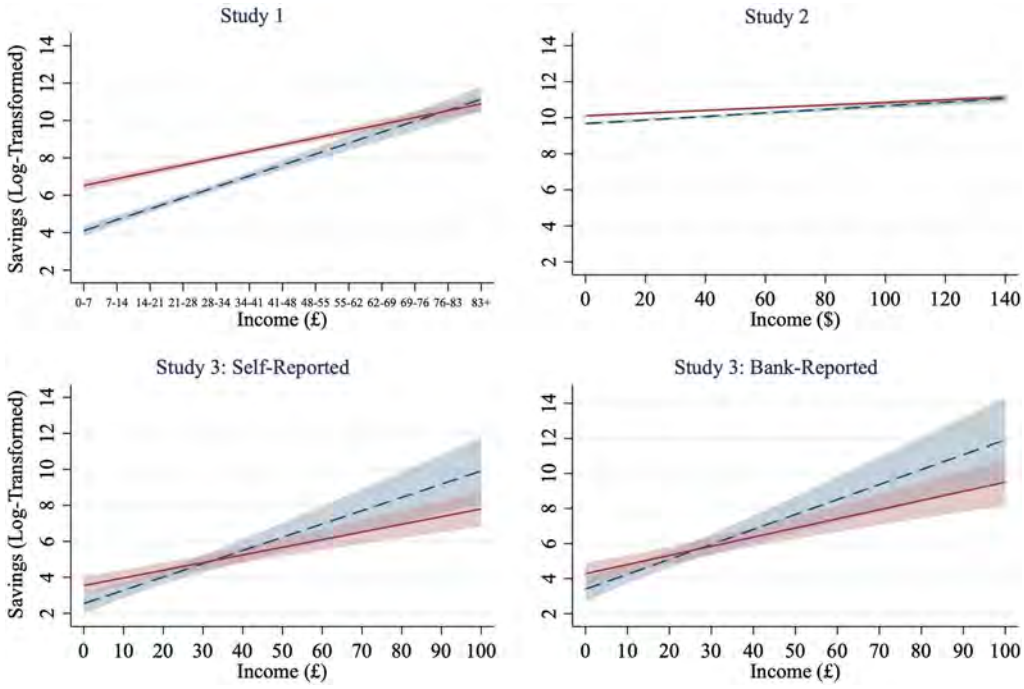
To ensure the validity of our findings, we conducted additional analyses using alternative statistical approaches. Ordinal logistic regression, accounting for the ordinal nature of our savings measure, corroborated our initial OLS results. This model revealed a significant positive effect of optimism on savings ($b = .27$, $z = 9.98$, 95% CI [.21, .32], $p < .001$). The interaction between optimism and income remained significant and negative ($b_{\text{interaction}} = -.002$, $z = -2.12$, 95% CI [−.004, −.0001], $p = .034$, $OR = .998$), confirming the attenuation of optimism's effect on savings at higher income levels.

We further enhanced the generalizability of our findings by incorporating survey weights provided by the polling organization. This approach strengthened our results, with weighted analyses showing an even more pronounced effect of optimism on savings, $b = 1.07$, $t(3425) = 15.67$, 95% CI [0.93, 1.20], $p < .001$, and a stronger interaction, $b_{\text{interaction}} = -.13$, $t(3298) = -6.16$, 95% CI [−.17, −.09], $p < .001$. These weighted analyses provide a more accurate representation of the population-level relationship, mitigating potential sampling biases and bolstering the external validity of our findings.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 2

Interaction Between Income and Optimism on Savings (Studies 1–3)



Note. Shaded regions indicate 95% confidence interval. Solid lines represent individuals high in optimism (1 *SD* above the mean), and dashed lines represent individuals low in optimism (1 *SD* below the mean). See the online article for the color version of this figure.

Study 2: Cross-Sectional Evidence From Add Health

Method

Data Set and Participants

This study utilized data from Wave 4 of the National Longitudinal Study of Adolescent to Adult Health (Add Health). This nationally representative study has followed a cohort of U.S. adolescents since 1994, collecting comprehensive data on health, education, family, and finances. We analyzed data from Wave 4 (conducted in 2008) when participants were 24–32 years old (N = 4,443; M_{age} = 29.0, 51.6% female; see Table 6 for descriptive statistics). This wave provided relevant data for our variables of interest: optimism, savings, and income. Follow-up data from Wave 5 were not included due to the absence of wealth measures.

Measures

Optimism. We assessed optimism using the included four items from the LOT-R (Scheier et al., 1994). Item responses were averaged and standardized (α = .88). See Table 3 for item wording.

Income. Income was self-reported, with participants indicating their earnings from the previous year before taxes. We report income in units of $1,000 ($M$ = 35.05, SD = 44.69).

Savings. This study measured participants' total household assets rather than savings specifically. Respondents selected from nine categories ranging from "less than $5,000" to "$1,000,000 or more." To facilitate analysis and maintain consistency with continuous measures used in other studies, we converted these categorical responses to numerical values. We assigned the midpoint of each category (e.g., "$5,000–$9,999" was assigned $7,500), with the highest category ("$1,000,000 or more") conservatively estimated at $1,000,000. The resulting variable was log-transformed to address distributional skewness (M = 10.18, SD = 1.59).

Covariates. To isolate the unique effects of optimism and income on savings, we controlled for several potentially confounding variables. These included demographic factors such as age (both age and age^2 to account for nonlinear effects), gender, and self-reported health (measured on a 1–5 scale, with higher scores indicating better health). We also assessed childhood SES using family income from Wave 1 of the data set (reported in units of $1,000) and a question about their parents' financial sufficiency ("Do you have enough money to pay your bills?," Yes/No). In addition, we controlled for current employment status (working at least 10 hr per week) and personality traits using the 20-item Mini-International Personality Item Pool scale to measure the Big Five personality traits (Oα = .65, Cα = .65, Eα = .71, Aα = .70, Nα = .63).

Transparency and Openness

The sample size for this study was determined based on the data available. All data exclusions are reported. This research utilizes data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) public-use data set. Researchers wishing to replicate or build upon this study can access the data through the Inter-University Consortium for Political and Social Research via

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 6
Descriptive Statistics (Study 2)

Measure	*N*	*M*	*SD*	Min	Max
Savings (categories)	4,582	3.67	1.96	1	9
Savings amount ($)	4,582	85,113.49	162,095.50	2,500	1,000,000
Log savings amount	4,582	10.18	1.59	7.82	13.82
Income	4,846	35.05	44.69	0	999.99
Optimism	5,095	0.00	1.00	−4.37	2.04
Age	5,114	29.00	1.78	25	34
Age^2	5,114	844.39	103.04	625	1,156
Female	6,503	1.52	0.50	1	2
In relationship	6,504	0.18	0.38	0	1
Employed	5,111	0.66	0.47	0	1
Child	6,504	0.40	0.49	0	1
Health	5,114	3.66	0.92	1	5
Extraversion	5,089	2.70	0.77	1	5
Agreeableness	5,090	2.18	0.60	1	5
Conscientiousness	5,096	2.34	0.68	1	4.75
Neuroticism	5,096	3.40	0.69	1	5
Openness	5,039	2.65	0.45	1	4.5
Child SES: Income	6,504	47.70	49.06	0	999
Child SES: Pay bills	5,505	0.82	0.39	0	1

Note. Savings amount is expressed in USD ($), and income and childhood SES are expressed in 1,000s of USD. Gender is coded as 1 = male, 2 = female (M = 1.52 indicates 52% of the sample is female). Relationship status (0 = not in a relationship, 1 = in a relationship), employment status (0 = unemployed, 1 = employed), and parental status (0 = no children, 1 = has children) are coded as binary variables. Health is measured on a scale from 1 (*poor*) to 5 (*excellent*). Child SES: Pay bills is coded as 0 = not enough money to pay bills, 1 = enough money to pay bills. Min = minimum; Max = maximum; SES = socioeconomic status; USD = U.S dollars.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

the persistent identifier at https://doi.org/10.3886/ICPSR21600.v25. Access requires registration with Inter-University Consortium for Political and Social Research and adherence to the Add Health terms of use. Comprehensive details about the study and procedures for data access can be found on the Add Health website at https://addhealth.cpc.unc.edu/. The analysis code is available on the OSF (https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6). This study was not preregistered.

Analytic Strategy

To test our hypotheses using the Add Health data set, we employed a series of regression models in Stata (Version 18). For Hypothesis 1b, which posits a positive association between optimism and savings, we used linear regression with optimism as the predictor and log-transformed total household assets as the outcome. A significant positive coefficient for optimism would support this hypothesis. We tested this in both unadjusted models and models controlling for relevant covariates, including childhood socioeconomic factors, to ensure robustness.

To test Hypothesis 2, which predicts a stronger optimism–savings relationship for lower income individuals, we extended our model to include an interaction term between optimism and income. A significant negative coefficient for this interaction would support Hypothesis 2, indicating that the positive effect of optimism on assets decreases as income increases.

We further explored these relationships by conducting separate analyses using the optimism and pessimism subscales, allowing us to examine potential differential effects. To illustrate the practical significance of our findings, we calculated predicted asset values for individuals at different levels of optimism and income. To address nonlinearity, we employed ordinal logistic regression as a robustness check. Given the single-cohort nature of Add Health, we paid particular attention to controlling for potential confounds related to age and life stage in all our models.

Results

Associations Between Optimism and Savings

Our analysis supports Hypothesis 1b, revealing a significant positive association between optimism and total household assets. Individuals with higher optimism scores reported greater total assets than those with lower scores, Table 7; b = .232, $t(4, 576)$ = 9.96, 95% CI [.187, .278], $p < .001$, $\beta = .145$. This relationship remained significant after controlling for relevant covariates including age, gender, income, and personality traits (Table 7, Model 2).

To illustrate the magnitude of this effect, we compared individuals 1 *SD* below and above the mean optimism level. The more optimistic group reported estimated total assets of $33,028.63, compared to $20,731.39 for the less optimistic group, a difference of $12,297.24. These findings suggest a substantial relationship between optimism and wealth accumulation. However, it is crucial to note that this measure captures total assets rather than liquid savings or specific saving behaviors, potentially reflecting broader economic outcomes associated with optimism beyond just saving practices.

Comparing Predictive Value of Optimism and Pessimism for Savings

Both optimism and pessimism subscales significantly predicted savings, with higher levels of both optimism and pessimism associated with increased savings (optimism items, $\beta = .036$, $p = .026$; pessimism items, $\beta = .134$, $p < .001$). Notably, however, the

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 7

Results of OLS Regression Predicting Savings From Optimism, Income, Their Interaction, and Covariates (Study 2)

	(M1) Unadjusted baseline			(M2) Additive control			(M3) Unadjusted baseline			(M4) Additive control			(M5) Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.23**	**[0.19, 0.28]**	**<.001**	**0.11**	**[0.05, 0.17]**	**<.001**	**0.22**	**[0.16, 0.28**	**<.001**	**0.12**	**[0.05, 0.19]**	**.001**	0.06	[−0.02, 0.14]	.142
Income							**0.01**	**[0.01, 0.01]**	**<.001**	**0.01**	**[0.01, 0.01]**	**<.001**	−0.01	[−0.39, 0.37]	.969
Optimism × Income							**−0.001**	**[−0.00, −0.00]**	**.047**	**−0.00**	**[−0.00, −0.00]**	**.049**	0.00	[−0.00, 0.00]	.626
Age				−0.51	[−1.38, 0.36]	.250				**−0.88**	**[−1.75, −0.01]**	**.048**	−0.86	[−2.08, 0.37]	.170
Age^2				0.01	[−0.01, 0.02]	.221				**0.02**	**[0.00, 0.03]**	**.043**	0.02	[−0.01, 0.04]	.154
Female				**−0.35**	**[−0.45, −0.24]**	**<.001**				**−0.24**	**[−0.35, −0.14]**	**<.001**	**−0.22**	**[−0.38, −0.07]**	**.005**
In relationship				**−0.32**	**[−0.44, −0.20]**	**<.001**				**−0.31**	**[−0.43, −0.19]**	**<.001**	**−0.30**	**[−0.47, −0.14]**	**<.001**
Employed				0.03	[−0.07, 0.13]	.605				−0.03	[−0.13, 0.07]	.526	−0.11	[−0.24, 0.03]	.113
Child				**−0.26**	**[−0.37, −0.16]**	**<.001**				**−0.20**	**[−0.31, −0.10]**	**<.001**	**−0.42**	**[−0.57, −0.27]**	**<.001**
Health				**0.21**	**[0.15, 0.26]**	**<.001**				**0.18**	**[.13, 0.24]**	**<.001**	**0.23**	**[0.15, 0.31]**	**<.001**
Extraversion				**−0.12**	**[−0.19, −0.06]**	**<.001**				**−0.10**	**[−0.16, −0.03]**	**.003**	**−0.12**	**[−0.22, −0.03]**	**.012**
Agreeableness				−0.05	[−0.14, 0.04]	.300				−0.05	[−0.14, 0.04]	.317	**−0.14**	**[−0.26, −0.02]**	**.019**
Conscientiousness				−0.07	[−0.14, 0.00]	.063				**−0.08**	**[−0.15, −0.00]**	**.044**	−0.04	[−0.14, 0.05]	.375
Neuroticism				0.01	[−0.07, 0.09]	.748				0.01	[−0.07, 0.09]	.879	−0.00	[−0.11, 0.11]	.992
Openness				0.04	[−0.07, 0.15]	.522				−0.02	[−0.13, 0.09]	.710	0.01	[−0.14, 0.16]	.897
Childhood income				**0.00**	**[0.00, 0.00]**	**<.001**				**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**
Money for bills				**0.34**	**[0.21, 0.47]**	**<.001**				**0.30**	**[0.18, 0.43]**	**<.001**	0.16	[−0.01, 0.34]	.065
Age × Income													0.00	[−0.03, 0.03]	.912
Age^2 × Income													−0.00	[−0.00, 0.00]	.883
Female × Income													0.00	[−0.00, 0.00]	.683
In Relationship × Income													−0.00	[−0.00, 0.00]	.999
Employed × Income													0.00	[−0.00, 0.00]	.383
Child × Income													**0.01**	**[0.00, 0.01]**	**<.001**
Health × Income													**−0.00**	**[−0.00, −0.00]**	**.040**
Extraversion × Income													0.00	[−0.00, 0.00]	.493
Agreeableness × Income													**0.00**	**[0.00, 0.00]**	**.019**
Conscientiousness × Income													−0.00	[−0.00, 0.00]	.374
Neuroticism × Income													−0.00	[−0.00, 0.00]	.896
Openness × Income													−0.00	[−0.00, 0.00]	.515
Childhood Income × Income													−0.00	[−0.00, 0.00]	.173
Money for Bills × Income													**0.00**	**[0.00, 0.01]**	**.027**
Constant	**10.17**	**[10.13, 10.22]**	**<.001**	**17.05**	**[4.47, 29.63]**	**.008**	**9.89**	**[9.84, 9.95]**	**<.001**	**22.38**	**[9.77, 34.99]**	**.001**	**21.97**	**[4.35, 39.59]**	**.015**
Observations		4,578			3,857			4,440			3,748			3,748	
R^2		0.02			0.09			0.07			0.12			0.14	

Note. This table presents results from ordinary least squares (OLS) regression models predicting savings from optimism and covariates in Study 2. The dependent variable, savings amount, is log-transformed. Bolded values indicate statistical significance at $p < .05$. The sample size varies slightly across models due to missing data on some variables. M = model; CI = confidence interval.

effect of the pessimism items was significantly stronger than that of the optimism items, $F(1, 4571) = 12.75$, $p < .001$). These results suggest that, in this sample, pessimism had a stronger association with savings behavior than optimism.

Moderating Effect of Income

As predicted, we found a significant interaction between optimism and income in our OLS regression model, Table 7, Model 3, $b_{interaction} = -.001$, $t(4436) = -1.99$, 95% CI [−.003, −.000], $p = .047$, $\beta = -.042$. Specifically, the positive association between optimism and savings was significantly stronger for individuals with lower income. At the 10th percentile of income, the effect of optimism was $b = .215$, $t(3298) = 7.16$, 95% CI [.156, .274], $p < .001$. In contrast, at the 90th percentile of income, the effect was $b = .136$, $t(3298) = 4.41$, 95% CI [.076, .197], $p < .001$.

Table 7 presents the results of our regression models with different sets of covariates. The interaction between optimism and income significantly predicted savings ($p < .05$) when controlling for the main effects of covariates (Model 4, "additive controls"). However, when interaction terms between covariates and income were included (Model 5, "full controls"), the optimism–income interaction became nonsignificant. A Likelihood Ratio Test comparing the two models showed that the model with full controls had a significantly better fit, $\chi^2(14) = 54.80$, $p < .001$, suggesting that the moderating effect of income on the optimism–savings relationship may be partially explained by the interactions between income and other covariates.

Alternative Model Specifications and Robustness Checks

Given the ordinal nature of our savings measure, we conducted ordinal logistic regression analyses to validate our findings from the OLS models. Results were consistent with the previous models, demonstrating a significant positive effect of optimism on savings ($b = .266$, $z = 9.98$, 95% CI [.214, .318], $p < .001$). Importantly, the interaction between optimism and income remained significant and negative ($b_{interaction} = -.002$, $z = -2.12$, 95% CI [−.004, −.0001], $p = .034$, $OR = .998$). Figure 3 visualizes this interaction based on predicted probabilities of having a small ($0–5 k) or large ($100–250 k) amount saved derived from the ordinal logistic regression model, showing that the positive effect of optimism on savings amount weakens as income increases.

Study 3: Cross-Sectional Evidence Using Retail Bank Transaction Data

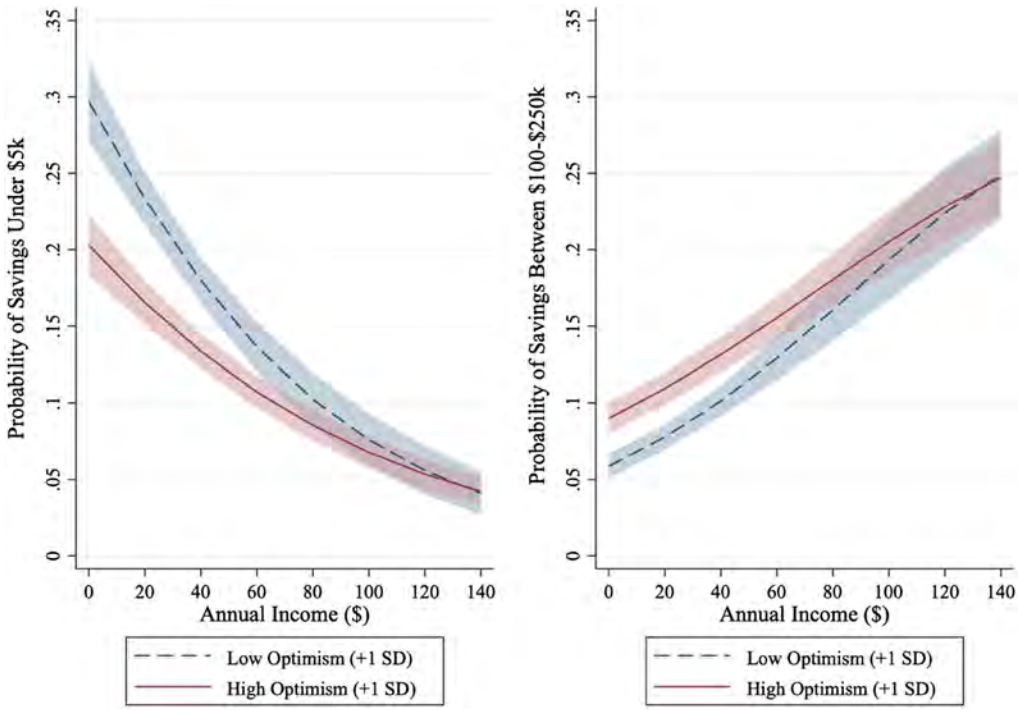
Method

Data Set and Participants

Study 3 utilizes a unique data set combining objective financial records from a U.K. retail bank with corresponding survey responses.

Figure 3

Income-Dependent Effects of Optimism on Savings Thresholds Using an Ordinal Logistic Regression Model (Study 2)



Note. Shaded regions indicate 95% confidence interval. Low and high optimism are defined as ±1 *SD* from the mean optimism score. Annual income is measured in thousands of dollars. See the online article for the color version of this figure.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

This approach provides a rare opportunity to analyze the relationship between optimism and saving behavior using both self-reported and bank-verified financial data. The bank invited customers via email to participate in the study. Of the 912 individuals who completed the survey and consented to data matching, 732 provided complete measures of both saving behavior and optimism. Participants were not compensated for their involvement. Descriptive statistics for the sample are presented in Table 8.

Measures

Optimism. Optimism was assessed using a single item from the LOT-R (Scheier et al., 1994): "In uncertain times, I usually expect the best." Responses were given on a 5-point Likert scale ($M = 3.08$, $SD = 1.07$), and scores were standardized for analysis. The single-item measure, required by the cooperating institution for brevity, prevented us from examining the differential effects of positively versus negatively worded items in this sample.

Income. Income was assessed using bank-reported monthly average credits to participants' checking accounts, which were multiplied by 12 to generate an annual measure ($M = £22{,}439.26$, $SD = £19{,}989.45$. Income is expressed in units of £1,000 in the analyses.

Savings. Study 3 quantifies savings through two complementary methods: objective bank data and self-reported estimates. The bank-reported measure reflects average balances in customers' checking and savings accounts, providing a precise, verifiable metric of liquid assets within the institution. This approach, while highly reliable, excludes external account holdings. Conversely, self-reported savings encompass participants' estimates of total savings and investments, excluding pension plans. This measure captures a broader wealth spectrum but introduces potential self-report biases. The correlation between these measures ($r = .48$, $p < .001$) suggests they capture related yet distinct aspects of financial behavior.

Covariates. To examine the unique effects of optimism on savings, we controlled for several variables that could confound the relationship. These include age ($M = 36.7$), gender (53% female), relationship status (52% in a relationship), employment status (73% employed), and whether they had children at home (28%). We also measured the Big Five personality traits using the Big Five Inventory–10 scale (Rammstedt & John, 2007), where we standardized the trait measures. It should be noted that our data set did not include measures for health, childhood SES, or financial sophistication.

Transparency and Openness

The sample size for this study was determined based on the available data. Due to confidentiality restrictions imposed by a legal agreement, the full data set cannot be made publicly accessible. However, researchers interested in accessing the data set are encouraged to contact the authors directly to explore potential access options. The analysis code is publicly available on our OSF page at https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6. This study was not preregistered.

Analytic Strategy

Our analysis of the retail bank data set employed regression models in Stata (Version 18) to test our hypotheses using both self-reported and bank-reported savings measures. For Hypothesis 1b, we used linear regression with optimism predicting log-transformed savings, running separate models for self-reported and bank-reported data. A significant positive optimism coefficient in either model would support Hypothesis 1b. For Hypothesis 2, we extended these models to include an optimism–income interaction term, with a significant negative interaction coefficient supporting the hypothesis. We ran unadjusted models and models controlling

Table 8
Descriptive Statistics (Study 3)

Measure	*N*	*M*	*SD*	Min	Max
Self-reported savings amount (£)	732	5728.51	18553.90	0.00	250,000
Log self-reported savings amount	732	4.32	4.06	0.00	12.43
Bank-reported savings amount (£)	732	34,631.73	98,891.61	0.00	916,632
Log bank-reported savings amount	732	5.26	4.74	0.00	13.73
Optimism	732	3.08	1.07	1.00	5.00
Income	719	22.42	19.98	0.05	222.47
Age	720	36.66	14.36	18.00	75.00
Age^2	720	1549.47	1216.68	324	5,625
Gender (female)	719	0.53	0.50	0.00	1.00
In relationship	732	0.52	0.50	0.00	1.00
Employed	732	0.73	0.44	0.00	1.00
Child	732	0.28	0.45	0.00	1.00
Extraversion	732	0.00	1.00	−2.60	2.22
Agreeableness	732	0.00	1.00	−3.46	2.01
Conscientiousness	732	0.00	1.00	−3.47	1.57
Neuroticism	732	0.00	1.00	−1.83	2.13
Openness	732	0.00	1.00	−3.23	2.19

Note. Savings variables are expressed in GBP (£), and income is expressed in 1,000s of GBP. The Big Five personality traits and financial literacy scores are standardized, with a mean of 0 and standard deviation of 1. Gender is coded as 0 = male, 1 = female. Relationship status (0 = not in a relationship, 1 = in a relationship), employment status (0 = unemployed, 1 = employed), and child (0 = no children, 1 = has children) are coded as binary variables. Min = minimum; Max = maximum; GBP = Great Britain Pounds.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

for relevant covariates. We report standardized and unstandardized coefficients with confidence intervals.

Results

Associations Between Optimism and Savings

Study 3 yielded mixed findings regarding the relationship between optimism and savings. Self-reported savings showed a modest but significant positive association with optimism, $b = .29$, $t(730) = 1.97$, 95% CI [.001, .587], $p = .049$, $\beta = .072$, suggesting that more optimistic individuals tend to report higher savings. This relationship persisted and slightly strengthened after controlling for relevant covariates (see Table 9).

Conversely, bank-recorded savings showed no significant association with optimism, $b = .199$, $t(730) = 1.14$, 95% CI [−.144, .554], $p = .250$, $\beta = .04$, a finding that persisted after covariate adjustment. This discrepancy between self-reported and objectively measured savings may be attributed to several factors. Optimism could potentially exert a stronger influence on individuals' perceptions and reporting of their financial status rather than directly impacting actual saving behaviors. This suggests a cognitive bias where optimistic individuals might overestimate their savings or financial well-being. Alternatively, the lack of association in bank-recorded data might stem from measurement limitations. Bank records, while objective, provide an incomplete picture of an individual's overall financial portfolio, omitting assets held in other institutions, investment accounts, or alternative forms of savings. This partial view could introduce additional variability into the data, potentially obscuring subtle relationships between optimism and actual saving behaviors.

Moderating Effect of Income

Study 3 revealed a consistent moderating effect of income on the association between optimism and savings, evident in both self-reported and bank-recorded measures. The positive relationship between optimism and savings was more pronounced among lower income individuals, as indicated by significant negative interaction terms, self-reported savings: $b_{interaction} = -.016$, $t(715) = -2.85$, 95% CI [−.026, −.005], $p = .005$, $\beta = -.116$; bank-reported savings: $b_{interaction} = -.017$, $t(715) = -2.33$, 95% CI [−.030, −.003], $p = .020$, $\beta = -.106$, Table 10 Models 1 and 3. This pattern persisted after controlling for relevant covariates, underscoring the robustness of income's moderating influence.

To put these results into context, for self-reported savings, optimism showed a significant positive effect at the 10th income percentile, $b = .423$, $t(715) = 2.62$, 95% CI [.106, .740], $p = .009$, but not at the 90th percentile, $b = -.367$, $t(715) = -1.47$, 95% CI [−.857, .123], $p = .142$.

For self-reported savings (Table 10), we found that adding covariate–income interactions did not significantly enhance the model's explanatory power, $\chi^2(11) = 10.14$, $p = .518$. Consequently, we retained the simpler model without these additional interactions, as it adequately captured the key relationships without unnecessary complexity. In contrast, for bank-recorded savings (Table 10), including covariate–income interactions significantly improved model fit, $\chi^2(11) = 29.90$, $p = .001$. Importantly, even in this more complex model, the income–optimism interaction remained significant. This persistence across different model specifications provides compelling evidence for the moderating role of income in the relationship between optimism and objectively measured savings.

Discussion of Cross-Sectional Results (Studies 1–3)

Studies 1–3 provide preliminary evidence for the relationship between optimism, income, and savings behavior across diverse samples and measures. These cross-sectional studies tested two primary hypotheses: a positive association between optimism and savings (Hypothesis 1b) and a stronger relationship between optimism and savings at lower income levels (Hypothesis 2).

Table 9

Results of OLS Regression Predicting Savings From Optimism and Covariates (Study 3)

	(M1) Self-report Unadjusted baseline			(M2) Self-report Additive control			(M3) Bank-reported Unadjusted baseline			(M4) Bank-reported Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.29**	**[0.00, 0.59]**	**.049**	**0.32**	**[0.02, 0.63]**	**.038**	0.20	[−0.14, 0.54]	0.250	0.29	[−0.07, 0.64]	.114
Age				−0.11	[−0.24, 0.03]	.115				−0.06	[−0.21, 0.10]	.464
Age^2				**0.00**	**[0.00, 0.00]**	**.037**				0.00	[−0.00, 0.00]	.135
Female				−0.23	[−0.84, 0.39]	.469				**1.15**	**[0.43, 1.87]**	**.002**
In relationship				0.53	[−0.08, 1.14]	.088				0.28	[−0.43, 0.99]	.444
Employed				**0.75**	**[0.01, 1.49]**	**.047**				0.75	[−0.12, 1.62]	.091
Child				**−1.66**	**[−2.33, −0.99]**	**<.001**				**−0.89**	**[−1.68, −0.10]**	**.027**
Extraversion				**−0.33**	**[−0.65, −0.02]**	**.038**				−0.21	[−0.58, 0.16]	.260
Agreeableness				−0.21	[−0.51, 0.09]	.171				**−0.43**	**[−0.78, −0.08]**	**.017**
Conscientiousness				0.15	[−0.16, 0.46]	.336				−0.00	[−0.36, 0.36]	.989
Neuroticism				−0.17	[−0.50, 0.16]	.314				−0.15	[−0.54, 0.24]	.442
Openness				0.25	[−0.05, 0.54]	.098				−0.08	[0.42, 0.26]	.647
Constant	**4.32**	**[4.02, 4.61]**	**<.001**	**5.38**	**[3.00, 7.76]**	**<.001**	**5.26**	**[4.92, 5.61]**	**<.001**	**4.24**	**[1.45, 7.03]**	**.003**
Observations		732			719			732			719	
R^2		0.01			0.08			0.00			0.07	

Note. Values in bold indicate statistical significance at $p < .05$. This table presents results from ordinary least squares (OLS) regression models predicting savings from optimism and covariates in Study 3. The dependent variable, savings amount, is log-transformed. Models 1 and 2 use self-reported savings, while Models 3 and 4 use bank-reported savings. The sample size decreases slightly in Models 2 and 4 due to missing data on some covariates. M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 10

Results of OLS Regression Predicting Bank-Reported Savings From Optimism, Income, Their Interaction, and Covariates (Study 3)

	(M1) Unadjusted baseline Self-reported			(M2) Additive control Self-reported			(M3) Unadjusted baseline Bank-reported			(M4) Additive control Bank-reported			(M5) Full controls Bank-reported		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.50**	**[0.16, 0.84]**	**.004**	**0.51**	**[0.15, 0.88]**	**.006**	**0.44**	**[0.03, 0.86]**	**.038**	**0.52**	**[0.09, 0.96]**	**.019**	**0.61**	**[0.15, 1.06]**	**.010**
Income	**0.06**	**[0.04, 0.07]**	**<.001**	**0.05**	**[0.04, 0.07]**	**<.001**	**0.07**	**[0.05, 0.09]**	**<.001**	**0.06**	**[0.04, 0.08]**	**<.001**	**0.32**	**[0.13, 0.52]**	**.001**
Optimism × Income	**−0.02**	**[−0.03, −0.00]**	**.005**	**−0.01**	**[−0.02, −0.00]**	**.032**	**−0.02**	**[−0.03, −0.00]**	**.020**	**−0.01**	**[−0.03, −0.00]**	**.032**	**−0.02**	**[−0.03, −0.00]**	**.011**
Age				**−0.16**	**[−0.29, −0.04]**	**.012**				−0.12	[−0.27, 0.03]	.109	0.05	[−0.17, 0.27]	.649
Age^2				**0.00**	**[0.00, 0.00]**	**.005**				**0.00**	**[0.00, 0.00]**	**.036**	0.00	[−0.00, 0.00]	.935
Female				−0.27	[−0.87, 0.33]	.378				**1.10**	**[0.39, 1.81]**	**.002**	0.31	[−0.74, 1.35	.564
In relationship				0.28	[−0.32, 0.88]	.357				−0.01	[−0.71, 0.69]	.975	0.47	[−0.59, 1.52]	.387
Employed				0.46	[−0.23, 1.15]	.192				0.42	[−0.45, 1.29]	.341	−0.27	[−1.41, 0.86]	.637
Child				**−1.65**	**[−2.28, −1.02]**	**<.001**				**−0.88**	**[−1.62, −0.14]**	**.020**	−0.25	[−1.33, 0.83]	.650
Extraversion				**−0.33**	**[−0.64, −0.02]**	**.038**				−0.21	[−0.57, 0.15]	.258	−0.13	[−0.69, 0.44]	.664
Agreeableness				−0.21	[−0.50, 0.07]	.133				**−0.44**	**[−0.77, −0.10**	**.010**	**−0.76**	**[−1.27, −0.25]**	**.003**
Conscientiousness				0.13	[−0.15, 0.41]	.348				−0.02	[−0.36, 0.31]	.885	−0.18	[−0.71, 0.34]	.496
Neuroticism				−0.16	[−0.48, 0.16]	.330				−0.14	[−0.51, 0.24]	.478	0.35	[−0.21, 0.92]	.220
Openness				0.23	[−0.06, 0.52]	.116				−0.09	[−0.43, 0.25]	.595	0.46	[−0.07, 0.99]	.087
Age × Income													**−0.01**	**[−0.02, −0.00]**	**.008**
Age^2 × Income													**0.00**	**[0.00, 0.00]**	**.015**
Female × Income													0.03	[−0.00, 0.07]	.051
In Relationship × Income													−0.03	[−0.06, 0.01]	.135
Employed × Income													0.03	[−0.02, 0.07]	.253
Child × Income													−0.02	[−0.06, 0.01]	.203
Extraversion × Income													−0.01	[−0.03, 0.01]	.406
Agreeableness × Income													0.02	[−0.00, 0.04]	.077
Conscientiousness × Income													0.00	[−0.02, 0.02]	.661
Neuroticism × Income													−0.02	[−0.05, −0.00]	.021
Openness × Income													**−0.02**	**[−0.04, −0.01]**	**.011**
Constant	**3.04**	**[2.64, 3.45]**	**<.001**	**5.86**	**[3.61, 8.10]**	**<.001**	**3.83**	**[3.32, 4.35]**	**<.001**	**4.78**	**[2.11, 7.44]**	**<.001**	1.43	[−2.58, 5.44]	.485
Observations		719			718			719			718			718	
R^2		0.07			0.14			0.07			0.12			0.16	

Note. Values in bold indicate statistical significance at $p < .05$. This table presents results from ordinary least squares (OLS) regression models predicting savings from optimism, income, their interaction, and covariates in Study 3. The dependent variable, savings amount, is log-transformed. Models are presented for both self-reported and bank-reported savings. M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

The findings offer partial support for Hypothesis 1b. Across all three studies, optimism showed a consistent positive correlation with self-reported savings (average $\beta = 0.163$, Table 11). This relationship persisted even after controlling for a wide array of demographic, socioeconomic, and personality factors, suggesting optimism's unique contribution to saving behavior. However, Study 3 revealed a critical discrepancy: While optimism correlated with self-reported savings ($\beta = 0.07$), it showed no significant association with bank-recorded savings ($\beta = 0.04$). This divergence raises important questions about the potential differences between perceived and actual saving behaviors, and the reliability of self-reported financial measures.

Hypothesis 2 received stronger support across the studies. The positive association between optimism and savings was consistently more pronounced for lower income individuals, as evidenced by the negative interaction terms in Table 11 (Study 1: $\beta = -0.32$; Study 3: $\beta = -0.12$ for self-reported savings). This aligns with the hypothesis that optimism may be particularly beneficial for financial behavior when economic resources are scarce. However, this effect weakened and lost statistical significance in Study 2's most comprehensive model, indicating potential influences from other socioeconomic and psychological factors not captured in the simpler models.

It is noteworthy that Study 2 employed a different outcome measure, using total assets rather than savings behavior. This methodological difference may contribute to the discrepancy in results. Total assets, being a more comprehensive measure of financial status, may capture long-term financial behaviors and circumstances that are less sensitive to the influence of optimism. Furthermore, the relationship between optimism and asset accumulation may follow a different pattern than its relationship with active saving behaviors.

Analysis of the LOT-R subscales produced mixed results. While Study 1 found no significant difference between optimism and pessimism in predicting savings, Study 2 suggested pessimism might have a stronger association. This inconsistency underscores the need for further investigation into the distinct roles of optimistic and pessimistic tendencies in shaping financial behaviors.

The cross-sectional nature of these studies limits causal inferences. Although the results align with the hypothesis that optimism promotes saving, alternative explanations cannot be ruled out. For instance, higher savings could potentially lead to increased optimism through enhanced financial security. Moreover, despite extensive controls, unmeasured variables such as childhood SES or financial education could confound the optimism–savings relationship by influencing both dispositional optimism and saving habits.

Table 11
Summary of Unadjusted Standardized Regression Coefficients for Studies 1–3

Study	DV	Optimism β	Optimism × Income β
1	Self-report savings	.27	−.32
2	Self-report savings	.15	−.04
3	Self-report savings	.07	−.12
3	Bank-report savings	.04	−.11

Note. Full model results, including control variables and significance levels, are reported in Studies 1–3. All savings measures are log-transformed. For Study 3, both self-reported and bank-reported savings data are presented. DV = dependent variable; β = standardized regression coefficient.

To address these limitations and strengthen causal claims, the subsequent studies employ longitudinal designs and utilize within-person analyses. These approaches will help establish whether changes in optimism predict subsequent saving behavior. By building on the foundation laid by these cross-sectional studies, the longitudinal investigations can offer additional evidence of the robustness of the association between optimism and savings.

Studies 4–8: Longitudinal Evidence

Studies 4–8 employ longitudinal designs to examine the dynamics between optimism, income, and savings behavior over time. These studies build upon the findings from Studies 1–3 by introducing multiwave and within-person analyses.

Studies 4–6 test our hypotheses using regression models at multiple time points. This allows us to examine, within a given data set, whether the association between optimism and savings replicates over multiple temporal observations. We additionally present lagged regression models for these studies in the additional online material (https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6), allowing us to examine how optimism predicts changes in future savings beyond what would be expected based on initial savings levels.

Studies 7 and 8 employ multiwave designs, enabling more sophisticated within-person analyses using fixed-effects models. These designs offer distinct advantages. Fixed-effects models account for stable individual characteristics (e.g., personality traits, early life experiences) that could confound the optimism–savings relationship (Wooldridge, 2010). The increased number of time points allows for detection of subtle within-person effects that might be missed in simpler two-wave designs. We can assess how changes in optimism relate to changes in savings behavior within individuals over time. By focusing on within-person variation, we further mitigate concerns about unmeasured confounding variables.

Study 4: Two-Wave Evidence From the Wisconsin Longitudinal Study

Method

Data Set and Participants

The participants in Study 4 were drawn from the Wisconsin Longitudinal Study (WLS) graduate sample. The WLS is a long-term survey of a random sample of 10,317 men and women born between 1937 and 1940 who graduated from Wisconsin high schools in 1957. The sample is representative of non-Hispanic White Americans with at least a high school education (see Herd et al., 2014). This study uses measures of income, wealth, and optimism from 2004 (T1) and follows up with wealth data from 2011 (T2), 7 years later. Optimism was only measured at T1 in 2004. Income, total net assets, and savings and investments were measured at both T1 and T2.

The WLS is known for its high response and retention rates (Herd, 2018), enhancing the reliability of our longitudinal analyses. Table 12 provides detailed descriptive statistics for key variables.

Measures

Optimism. Optimism was assessed using six items from the LOT-R scale (see Table 3 for item wording; Scheier et al., 1994).

Table 12
Descriptive Statistics (Study 4)

Measure	Year	*N*	*M*	*SD*	Min	Max
Savings ($)	2004	11,535	114,356.00	315,491.50	0.00	3,770,000
Log savings	2004	11,535	7.52	5.05	0.00	15.14
Total net assets ($)	2004	11,536	811,632.50	1,331,392.00	−15000.00	12,000,000
Log total net assets	2004	11,211	12.87	1.62	0.00	16.30
Savings ($)	2011	9,684	133,402.30	365,408.60	0.00	4,500,000
Log savings	2011	9,684	7.72	5.04	0.00	15.32
Total net assets ($)	2011	9,684	603,460.40	1,097,481.00	−42500.00	11,300,000
Log total assets amount	2011	9,462	11.58	3.71	0.00	16.24
Income	2004	11,396	64.06	80.23	0.00	710.00
Optimism	2004	10,605	3.03	0.47	0.33	4.00
Age	2004	18,433	39.36	5.29	18.00	60.00
Age^2	2004	18,433	1577.09	424.89	324.00	3600.00
Female	2004	19,048	0.51	0.50	0.00	1.00
In relationship	2004	10,550	0.78	0.41	0.00	1.00
Employed	2004	7,709	0.44	0.50	0.00	1.00
Child	2004	13,764	2.93	1.77	0.00	18.00
Health	2004	9,793	4.01	0.68	1.00	5.00
Extraversion	2004	12,773	0.00	1.00	−2.44	1.33
Agreeableness	2004	12,954	0.00	1.00	−3.81	1.03
Conscientiousness	2004	12,985	0.00	1.00	−3.26	1.05
Neuroticism	2004	12,797	0.00	1.00	−1.48	1.90
Openness	2004	12,907	0.00	1.00	−2.89	1.10

Note. This table presents descriptive statistics for key variables in Study 4. Data were collected at two time points: T1 (2004) and T2 (2011). Savings and asset variables are expressed in USD ($), and income is expressed in 1,000s of USD. The Big Five personality traits are standardized, with a mean of 0 and standard deviation of 1. Binary variables are coded as follows: female (0 = male, 1 = female), in relationship (0 = single, 1 = in a relationship), and employed (0 = unemployed, 1 = employed). Child represents the number of children. Health is measured on a 5-point scale (1 = *poor*, 5 = *excellent*). Optimism was measured only at T1 using the Life Orientation Test–Revised on a 4-point scale. *N* varies across variables due to missing data. Min = minimum value; Max = maximum value; T = time; USD = U.S dollars.

The six items were averaged ($M = 3.03$, $SD = .47$) and demonstrated high internal consistency ($\alpha = .88$). For analyses, we standardized the composite score to facilitate interpretation.

Income. Household income was calculated by aggregating various income sources for each household member. These sources included wages, social security benefits, pensions, public assistance, other government programs, child support, and additional income streams. These were then summed together. In 2004, the resulting mean income was $64,063.03 ($SD = 80,232.51$). This measure is reported in units of $1,000 for the analyses.

Total Net Assets and Savings. The WLS included detailed information on various financial holdings, including both liquid and illiquid assets. We calculated two distinct measures to capture participants' wealth: total net assets and savings.

Total net assets represent a comprehensive measure of an individual's overall accumulated wealth. We calculated this by summing all reported assets (as detailed in the online Supplemental Materials C1) and subtracting all reported debts. This measure provides a broad overview of financial status, including both liquid and illiquid assets. However, the inclusion of illiquid assets, such as property, may complicate comparisons with studies focused solely on liquid wealth. In addition, a small number of participants with negative total net assets were excluded from this measure due to the impossibility of log-transforming negative values.

The savings measure focuses on more liquid forms of wealth, designed to be more directly comparable to measures used in other studies. We calculated this by summing the reported values of checking accounts, savings accounts, money market funds, and other liquid investments such as bonds and stocks. Both measures were assessed at two time points: in 2004 (baseline) and 2011 (7-year follow-up). The two measures were moderately correlated ($r = .57$ in 2004).

Covariates. To control for potential confounds, we included participant age ($M = 39.36$, $SD = 5.28$), gender (50.6% female), marital status (43.4% married), number of children ($M = 2.7$, $SD = 1.53$). Participants' self-reported health status, on a scale from 1 to 5, and their employment status were also included as covariates. Furthermore, a 29-item measure of the Big Five personality traits ($O\alpha = .62$; $C\alpha = .69$; $E\alpha = .75$; $A\alpha = .69$; $N\alpha = .74$) were also included as covariates in our analyses.

Transparency and Openness

The sample size for this study was determined based on the data available. All data exclusions are reported. Data from the WLS can be accessed via the University of Wisconsin–Madison's WLS website (https://www.ssc.wisc.edu/wlsresearch/). Qualified researchers are encouraged to apply for data set access through the site. The analysis code used in this study is publicly available on our OSF page at https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6. This study was not preregistered.

Analytic Strategy

Our analysis of the WLS data employed regression models in Stata (Version 18) to test our hypotheses using both savings and net assets as

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

outcome measures. To test Hypothesis 1b, which posits a positive association between optimism and savings, we used linear regression with optimism as the predictor and log-transformed savings (or net assets) as the outcome. We ran these models for both contemporaneous (2004) and future (2011) financial outcomes. A significant positive optimism coefficient in these models would support Hypothesis 1b. We ran both unadjusted models and models controlling for relevant covariates to ensure robustness. To test Hypothesis 2, which predicts a stronger optimism–savings relationship for lower income individuals, we extended our models to include an interaction term between optimism and income. A significant negative interaction coefficient would support Hypothesis 2, indicating that the positive effect of optimism on financial outcomes decreases as income increases. We conducted additional analyses using separate optimism and pessimism subscales to explore potential differential effects. To illustrate practical significance, we calculated predicted financial outcomes for individuals at different levels of optimism and income. Throughout our analyses, we report both standardized and unstandardized coefficients with 95% confidence intervals.

Results

Associations Between Optimism and Savings

Our analysis revealed a consistent positive association between optimism and savings behavior, supporting Hypothesis 1b. In 2004, optimism was significantly associated with both savings, $b = .26$, $t(9, 620) = 16.74$, 95% CI [.23, .29], $p < .001$, $\beta = .17$, and net assets, $b = .53$, $t(9, 800) = 9.98$, 95% CI [.43, .63], $p < .001$, $\beta = .13$, suggesting that higher levels of optimism are linked to increased savings and wealth. These effects remained significant after including covariates (Table 13).

Effects of Optimism on Subsequent Savings

Using longitudinal data, we explored the relationship between optimism measured in 2004 (Wave 1) and savings outcomes in 2011 (Wave 2). Our analysis revealed that optimism significantly predicted both savings and net assets 7 years later, even when controlling for various variables.

In unadjusted baseline models, optimism in 2004 positively predicted savings in 2011, $b = .50$, $t(8, 077) = 8.86$, 95% CI [.39, .61], $p < .001$, and net assets in 2011, $b = .41$, $t(8, 244) = 10.05$, 95% CI [.33, .49], $p < .001$, in 2011. Figure 4 provides a visual representation of these relationships under various modeling conditions, highlighting the consistent significance of optimism in predicting savings outcomes. The effect sizes appear largest for Wave 1 savings, followed by Wave 2 savings. The effects on net assets, while smaller, remain significant. Including control variables generally reduces the effect sizes slightly, but the relationships remain statistically significant across all models.

Comparing Predictive Value of Optimism and Pessimism for Savings

We examined the distinct predictive roles of optimism and pessimism subscales from the LOT-R in personal savings and net asset accumulation. Our analysis revealed that both optimism and pessimism were significantly associated with increased savings and assets in 2004 and 2011. Notably, pessimism consistently demonstrated a stronger association with financial outcomes than optimism across all measures and time points (Table 14).

For savings in 2004, pessimism ($\beta = .132$, $p < .001$) showed a markedly stronger effect than optimism ($\beta = .047$, $p < .001$). This pattern persisted in 2011, with pessimism ($\beta = .118$, $p < .001$) outweighing optimism ($\beta = .044$, $p = .026$). Net assets followed a similar trend, with pessimism exhibiting larger coefficients in both

Table 13

Results of OLS Regression Predicting Savings and Net Assets (2004) From Optimism and Covariates (Study 4)

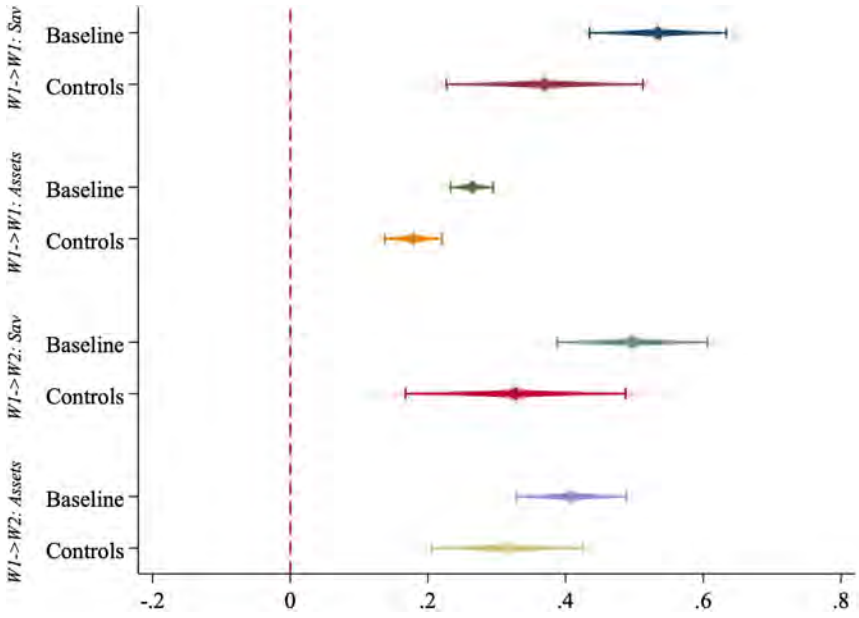
	(M1) Net assets 2004 Unadjusted baseline			(M2) Net assets 2004 Additive control			(M3) Savings 2004 Unadjusted baseline			(M4) Savings 2004 Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.26**	**[0.23, 0.29]**	**<.001**	**0.18**	**[0.14, 0.22]**	**<.001**	**0.53**	**[0.43, 0.63]**	**<.001**	**0.36**	**[0.22, 0.51]**	**<.001**
Age				**7.54**	**[1.71, 13.37]**	**.011**				17.64	[−2.52, 37.80]	.086
Age^2				**−0.09**	**[−0.17, −0.02]**	**.014**				−0.22	[−0.48, 0.04]	.097
Female				**−0.19**	**[−0.26, −0.11]**	**<.001**				**−1.44**	**[−1.71, −1.18]**	**<.001**
In relationship				**0.97**	**[0.88, 1.07]**	**<.001**				−0.11	[−0.43, 0.20]	.485
Employed				**−0.08**	**[−0.15, −0.00]**	**.041**				−0.17	[−0.42, 0.08]	.188
Child				**−0.06**	**[−0.08, −0.04]**	**<.001**				**−0.08**	**[−0.16, −0.00]**	**.039**
Health				**0.31**	**[0.26, 0.37]**	**<.001**				**0.42**	**[0.23, 0.61]**	**<.001**
Extraversion				0.00	[−0.01, 0.02]	.834				−0.03	[−0.08, 0.02]	.231
Agreeableness				**−0.04**	**[−0.05, −0.02]**	**<.001**				**−0.10**	**[−0.16, −0.03]**	**.003**
Conscientiousness				−0.01	[−0.02, 0.01]	.445				−0.05	[−0.11, 0.00]	.057
Neuroticism				0.01	[−0.00, 0.02]	.111				−0.02	[−0.07, 0.02]	.303
Openness				**0.05**	**[0.04, 0.07]**	**<.001**				**0.09**	**[0.03, 0.14]**	**.001**
Constant	**11.68**	**[11.61, 11.76]**	**<.001**	**−139.04**	**[−251.56, −26.53]**	**.015**	**7.77**	**[7.68, 7.87]**	**<.001**	−343.12	[−732.37, 46.13]	.084
Observations		9,622			5,506			9,802			5,542	
R^2		0.03			0.16			0.01			0.05	

Note. Values in bold indicate statistical significance at $p < .05$. This table presents results from ordinary least squares (OLS) regression models predicting savings and net assets from optimism and covariates in Study 4, using data from 2004 (T1, time 1). The dependent variables, savings and net assets, are log-transformed. The sample size decreases in Models 2 and 4 due to missing data on some covariates. M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 4

Effects of Optimism on Savings and Net Assets Across Time and Model Specifications (Study 4)



Note. Optimism was measured at Wave 1 (2004). The top two rows show effects on Wave 1 (2004) outcomes, while the bottom two rows show effects on Wave 2 (2011) outcomes. Points represent coefficient estimates. Thick lines indicate 95% confidence interval, while thinner extensions show 99% confidence interval. All models demonstrate statistically significant positive effects of optimism on financial outcomes. Savings and net assets are log-transformed in all models. W = wave. See the online article for the color version of this figure.

2004 (β = .177 vs. β = .132) and 2011 (β = .125 vs. β = .062), all statistically significant at $p < .001$.

Wald tests confirmed the statistical significance of these differences across all outcomes, with *F*-statistics ranging from 14.94 to 53.02 (all $p < .001$). These results suggest that while both optimism and pessimism influence financial behavior, pessimism may have a more pronounced effect on savings and asset accumulation over time.

Moderating Effect of Income

The relationship between optimism and savings was consistently stronger for individuals with lower incomes, supporting Hypothesis 2. At Time 1 (2004), using the savings measure, we found a significant interaction between optimism and income, $b_{\text{interaction}} = -.005$, $t(9731) = -8.19$, 95% CI [−.006, −.004], $p < .001$, β = −.106.

For low-income individuals (10th percentile), optimism had a significant positive effect on savings, $b = .56$, $t(3298) = 9.27$, 95% CI [.44, .68], $p < .001$. In contrast, for high-income individuals (90th percentile), the effect of optimism was not significant, $b = -.08$, $t(3298) = -1.31$, 95% CI [−.21, .04], $p = .191$. These findings support Hypothesis 2 and remain consistent after controlling for various covariates. Similar interaction effects were observed for net assets and across both time points (2004 and 2011), as illustrated in Figure 5.

Table 14

Standardized Regression Coefficients (β) for Optimism and Pessimism Subscales Predicting Savings and Net Assets in 2004 and 2011

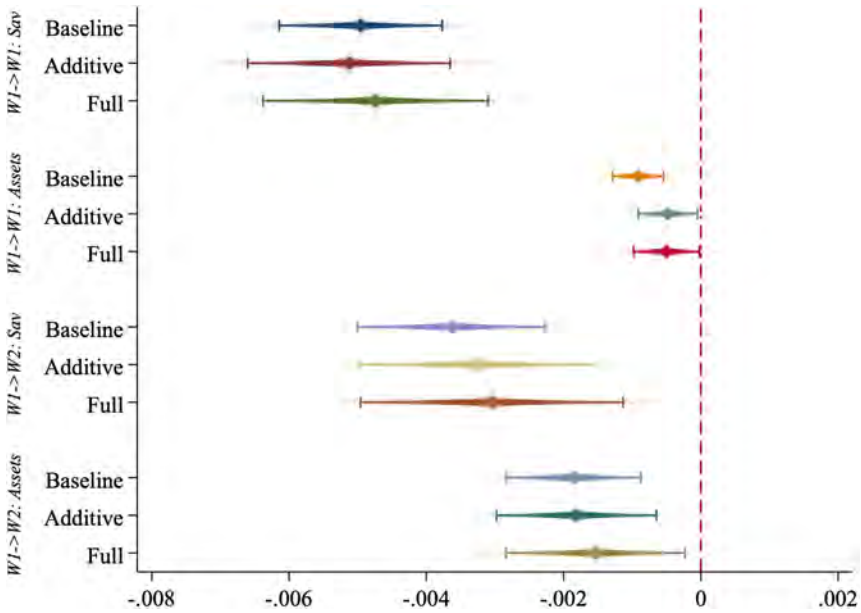
	Optimism		Pessimism		Wald test (pessimism vs. optimism)	
Saving measure	β	*p*	β	*p*	*F* (*df*)	*p*
Savings 2004	**.047**	**<.001**	**.132**	**<.001**	**53.02 (1, 9,946)**	**<.001**
Savings 2011	**.044**	**.026**	**.118**	**<.001**	**33.99 (1, 8,361)**	**<.001**
Net assets 2004	**.132**	**<.001**	**.177**	**<.001**	**14.94 (1, 9,759)**	**<.001**
Net assets 2011	**.062**	**<.001**	**.125**	**<.001**	**24.73 (1, 8,191)**	**<.001**

Note. Values in bold indicate statistical significance at $p < .05$. Savings and net assets are log-transformed. A visual representation of these findings is available in online Supplemental Materials C3.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 5

Coefficients Plot of the Moderating Effect of Income on Optimism for Savings and Net Assets (Study 4)



Note. Optimism is always measured at Wave 1 (2004). The top two panels represent savings and net assets at Wave 1 (2004), and the bottom panels represent savings and net assets at Wave 2 (2011). Points represent coefficient estimates. Thick lines indicate 95% confidence interval, while thinner extensions show 99% confidence interval. W = wave. See the online article for the color version of this figure.

Study 5: Two-Wave Evidence From the British Cohort Study

Method

Data Set and Participants

Study 5 utilized data from the British Cohort Study 1970 (BCS70), a comprehensive longitudinal survey tracking individuals born in Britain during a single week in 1970 (Elliott & Shepherd, 2006). The BCS70 covers a broad spectrum of topics including health, education, and socioeconomic circumstances from birth to midlife. We focused on two specific waves: 2012–2014 (T1; ages 42–44) and 2014–2016 (T2; ages 46–48), as these waves consistently measured our primary variables of interest: optimism, income, and savings (see Table 15 for descriptive statistics). The BCS70 employs various retention strategies, including regular mailings, birthday cards, and online engagement. However, selective attrition remains a potential concern (Sullivan et al., 2023).

Table 15

Descriptive Statistics (Study 5)

	T1					T2				
Measure	*N*	*M*	*SD*	Min	Max	*N*	*M*	*SD*	Min	Max
Log savings amount	8,015	6.52	4.18	0.00	13.82	7,178	7.32	4.17	0.00	18.42
Income (£)	8,785	33.15	23.00	0.5	128.9	7,909	42.34	37.87	0.001	250
Optimism	8,573	3.33	0.89	1.00	5.00	7,910	3.50	0.87	1.00	5.00
Gender (female)	9,841	0.52	0.50	0.00	1.00	8,581	0.52	0.50	0.00	1.00
Marital status	9,841	0.60	0.49	0.00	1.00	8,581	0.62	0.49	0.00	1.00
Employed	9,734	0.86	0.35	0.00	1.00	8,578	0.87	0.34	0.00	1.00
Child	9,841	1.47	1.17	0.00	9.00	8,581	1.32	1.11	0.00	9.00
Health	9,799	3.60	1.07	1	5	8,576	3.44	1.10	1	5
Childhood SES	13,407	4.01	1.23	1.00	7.00	13,407	4.01	1.23	1.00	7.00

Note. Savings is expressed in log GBP (£), and income is expressed in 1,000s of GBP. Gender (0 = male, 1 = female), marital status (0 = not married, 1 = married), and employment status (0 = unemployed, 1 = employed) are coded as binary variables. Child represents the number of children currently living in the household. Childhood SES was categorical and measured at age 10; it remains consistent across both waves. Income measures differed across waves and so are not directly comparable. Min = minimum value; Max = maximum value; T = time; SES = socioeconomic status; GBP = Great Britain Pounds.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Measures

Optimism. A single item from the Warwick–Edinburgh Mental Well-Being Scale (Tennant et al., 2007) measured optimism: "I've been feeling optimistic about the future." Participants rated this item on a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*). The measure was standardized for analysis ($M = 3.32$, $SD = 0.89$). The correlation between optimism at T1 and T2 was $r = .434$, $p < .001$. Due to the single-item measure, distinctions between optimism and pessimism could not be examined using this data set.

Household Income. Income measurement differed between the two waves. At T1, gross income was assessed, encompassing all sources including overtime, bonuses, commissions, tips, and tax refunds. This was initially reported in categories and subsequently converted to continuous amounts for analysis. At T2, net income was measured, focusing on take-home pay. Participants were specifically instructed to consult their most recent pay slip to ensure accuracy in reporting. The measure was reported in units of £1,000.

Savings. Respondents reported their "total amount of savings and investments" ($M = £24{,}227.39$, $SD = £85{,}987.43$). To facilitate analyses, we log transformed the savings amounts ($M = 6.52$, $SD = 4.18$).

Covariates. Covariates included gender, relationship status, employment status, number of children in the household, self-reported health, and childhood SES (measured as gross family income at age 10 across seven categories, ranging from 0–£35 to £250 or more per week). Given the cohort's near-uniform age, age was not included as a covariate in this study.

Transparency and Openness

The sample size for this study was determined based on the data available. All data exclusions are fully reported. Data from the BCS70 can be accessed through the U.K. Data Service at the University of Essex. Researchers can obtain the data set via the persistent identifier at https://doi.org/10.5255/UKDA-SN-8547-2 by registering with the U.K. Data Service and agreeing to their terms of use. Detailed documentation is available on the official BCS70 website (https://cls.ucl.ac.uk/cls-studies/1970-british-cohort-study/). The analysis code for this study is available on our OSF page at https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6. This study was not preregistered.

Analytic Strategy

Our analysis of the BCS70 data employed regression models in Stata (Version 18) to test our hypotheses across two time points (2012–2014 and 2014–2016). To test Hypothesis 1b, which posits a positive association between optimism and savings, we used linear regression with optimism as the predictor and log-transformed savings as the outcome. We ran these models for both contemporaneous and future savings, with a significant positive coefficient for optimism supporting Hypothesis 1b. To ensure robustness, we conducted these analyses with both unadjusted models and models controlling for relevant covariates. To test Hypothesis 2, which predicts a stronger optimism–savings relationship for lower income individuals, we extended our models to include an interaction term between optimism and income. A significant negative coefficient for this interaction would support Hypothesis 2, indicating that the positive effect of optimism on savings decreases as income increases. We tested this interaction in both contemporaneous and longitudinal models.

Results

Associations Between Optimism and Savings

Our analysis revealed significant positive associations between optimism and savings at both time points. At T1 (ages 42–44), participants with higher optimism had higher savings, $b = .781$, $t(7,041) = 16.10$, 95% CI [.686, .876], $p < .001$, $\beta = .188$. Similarly, at T2 (ages 46–48), higher optimism predicted greater savings, $b = .703$, $t(6, 673) = 13.88$, 95% CI [.604, .803], $p < .001$, $\beta = .167$. These associations remained significant after including covariates (Table 16).

Effects of Optimism on Subsequent Savings

Optimism at T1 significantly predicted savings at T2, $b = .752$, $t(5983) = 14.09$, 95% CI [.648, .857], $p < .001$, $\beta = .179$, suggesting that individuals with higher optimism at ages 42–44 had higher savings at ages 46–48. This effect persisted even after controlling for covariates (Table 16, Model 6).

Moderating Effect of Income

The interaction between income and optimism on contemporaneous savings was significant at both time points, T1: $b_{interaction} = -.007$, $t(7039) = -4.65$, 95% CI [−.010, −.004], $p < .001$, $\beta = -.076$; T2: $b_{interaction} = -.004$, $t(6383) = -2.93$, 95% CI [−.007, −.001], $p = .003$, $\beta = -.04$, consistent with Hypothesis 2. This interaction effect persisted longitudinally, with T1 optimism–income interaction predicting T2 savings, $b_{interaction} = -.008$, $t(5981) = -4.63$, 95% CI [−.011, −.005], $p < .001$, $\beta = -.09$. These findings consistently demonstrate that the relationship between optimism and savings is stronger for lower income individuals.

Simple slopes analysis at T1 illustrates this moderating effect. While optimism positively predicted savings for both low-income, 10th percentile, $b = .62$, $t(6, 603) = 9.51$, 95% CI [.49, .75], $p < .001$, and high income, 90th percentile, $b = .33$, $t(6, 603) = 4.96$, 95% CI [.20, .46], $p < .001$, individuals, the effect was nearly twice as strong for the low-income group. This contrast underscores the potentially greater importance of optimism as a psychological resource for savings behavior among those with fewer economic resources.

Additional analyses incorporating additional time points and control variables (Table 17, Figure 6) revealed mixed findings. The optimism–income interaction remained significant with additive controls at T1, but lost significance when income–covariate interactions were included. Similar patterns emerged at T2. Likelihood ratio tests confirmed that including income–covariate interactions significantly improved model fit, suggesting complex interrelationships between income, optimism, and other factors influencing savings behavior. This pattern indicates that the moderating effect of income on the optimism–savings relationship is not entirely independent of other factors. Instead, it may be partially explained by how income interacts with other variables such as employment status, or personality traits in influencing savings behavior.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 16
Results of Regressions Predicting Savings (T1 and T2) From Optimism (T1 and T2) and Covariates (Study 5)

	(M1) Savings T1 Unadjusted baseline			(M2) Savings T1 Additive control			(M3) Savings T2 Unadjusted baseline		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism T1	**0.78**	**[0.69, 0.88]**	**<.001**	**0.48**	**[0.37, 0.58]**	**<.001**			
Optimism T2							**0.70**	**[0.60, 0.80]**	**<.001**
Female				**−0.39**	**[−0.59, −0.20]**	**<.001**			
In relationship				**1.22**	**[1.01, 1.43]**	**<.001**			
Employed				**0.92**	**[0.61, 1.23]**	**<.001**			
Child				**−0.46**	**[−0.55, −0.37]**	**<.001**			
Health				**0.66**	**[0.56, 0.76]**	**<.001**			
Child SES				**0.46**	**[0.38, 0.54]**	**<.001**			
Constant	**6.66**	**[6.56, 6.75]**	**<.001**	**1.68**	**[1.15, 2.20]**	**<.001**	**7.40**	**[7.30, 7.50]**	**<.001**
Observations		7,043			6,029			6,675	
R^2		0.04			0.14			0.03	

	(M4) Savings T2 Additive control			(M5) Savings T2 Unadjusted baseline			(M6) Savings T2 Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism T1				**0.75**	**[0.65, 0.86]**	**<.001**	**0.48**	**[0.37, 0.60]**	**<.001**
Optimism T2	**0.41**	**[0.30, 0.52]**	**<.001**						
Female	**−0.39**	**[−0.59, −0.18]**	**<.001**				**−0.35**	**[−0.57, −0.13]**	**.001**
In relationship	**0.95**	**[0.72, 1.17]**	**<.001**				**0.93**	**[0.69, 1.17]**	**<.001**
Employed	**0.80**	**[0.45, 1.16]**	**<.001**				**0.97**	**[0.61, 1.33]**	**<.001**
Child	**−0.30**	**[−0.40, −0.20]**	**<.001**				**−0.42**	**[−0.52, −0.32]**	**<.001**
Health	**0.64**	**[0.54, 0.75]**	**<.001**				**0.53**	**[0.42, 0.64]**	**<.001**
Child SES	**0.40**	**[0.32, 0.49]**	**<.001**				**0.42**	**[0.33, 0.50]**	**<.001**
Constant	**2.73**	**[2.17, 3.30]**	**<.001**	**7.47**	**[7.37, 7.57]**	**<.001**	**3.10**	**[2.48, 3.72]**	**<.001**
Observations		5,731			5,985			5,146	
R^2		0.10			0.03			0.10	

Note. This table presents results from ordinary least squares regression models predicting savings from optimism and covariates in Study 5. The dependent variable, savings, is log-transformed. Bolded values indicate statistical significance at $p < .05$. T1 refers to data collected in 2012–2014 (ages 42–44) and T2 to data collected in 2014–2016 (ages 46–48). M = model; CI = confidence interval; T = time; SES = socioeconomic status.

Study 6: Multiwave Evidence From 14 European Countries in Survey of Health, Ageing and Retirement in Europe

Method

Data Set and Participants

Study 6 utilized data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a comprehensive cross-national, longitudinal survey investigating the health, economic, and social well-being of older European adults. We analyzed data from Waves 1, 2, and 4, collected in 2004, 2006, and 2011, respectively. Wave 3 was excluded due to the absence of our key measures. Our analysis focused on optimism, income, and wealth, with covariates matched to the corresponding optimism wave.

Optimism was measured only in Waves 1 and 2, limiting our use of later waves. We used Wave 4 for income and wealth outcomes because it was the closest wave to the optimism measures from Waves 1 and 2.

The SHARE data set encompasses 14 European countries, representing diverse cultural and economic contexts. This multicountry, multiwave design offers a unique opportunity to examine both short-term (Wave 1–2) and longer term (Wave 1–4) effects of optimism on financial outcomes. By controlling for country-specific influences, we can disentangle universal trends from culturally specific phenomena, providing a more generalizable understanding of how optimism, income, and savings behaviors interplay across diverse European contexts.

Measures

Optimism. We assessed optimism using a seven-item version of the LOT-R scale. Due to survey design, Wave 2 included approximately half the observations for optimism compared to Wave 1. Responses were averaged (Wave 1: $M = 3.58$, $SD = 0.60$), standardized and demonstrated good internal consistency ($\alpha = .74$). Optimism measures in Waves 1 and 2 were moderately correlated ($r = .41$, $p < .001$).

Income. We utilized the survey-calculated income measure, which aggregated all household income components (e.g., wages) and report this in units of €1,000 (Wave 1: M = €43,020, SD = 63,160). Responses were imputed using methods detailed in De Luca et al. (2015) and De Luca and Rossetti (2019).

Savings. We defined savings as the total amount of household gross financial assets, including bank accounts, bonds, stocks, and

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 17

Results of OLS Regression Predicting Contemporaneous Savings From Optimism, Income, Their Interaction, and Covariates (T1; Study 5)

	(M1) Unadjusted baseline			(M2) Additive control			(M3) Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.69**	**[0.53, 0.85]**	**<.001**	**0.51**	**[0.33, 0.68]**	**<.001**	**0.41**	**[0.24, 0.59]**	**<.001**
Income	**0.06**	**[0.06, 0.07]**	**<.001**	**0.05**	**[0.05, 0.06]**	**<.001**	**0.10**	**[0.08, 0.13]**	**<.001**
Optimism × Income	**−0.01**	**[−0.01, −0.00]**	**.002**	**−0.01**	**[−0.01, −0.00]**	**.022**	−0.00	[−0.01, 0.00]	.342
Female				**−0.29**	**[−0.48, −0.10]**	**.003**	−0.26	[−0.61, 0.09]	.141
In relationship				**0.64**	**[0.42, 0.86]**	**<.001**	**0.87**	**[0.48, 1.25]**	**<.001**
Employed				**0.44**	**[0.13, 0.75]**	**.005**	**0.94**	**[0.47, 1.40]**	**<.001**
Child				**−0.51**	**[−0.60, −0.42]**	**<.001**	**−0.68**	**[−0.83, −0.53]**	**<.001**
Health				**0.51**	**[0.41, 0.61]**	**<.001**	**0.66**	**[0.49, 0.83]**	**<.001**
Childhood SES				**0.30**	**[0.22, 0.38]**	**<.001**	**0.41**	**[0.27, 0.55]**	**<.001**
Female × Income							−0.00	[−0.01, 0.01]	.764
In Relationship × Income							−0.01	[−0.02, 0.00]	.148
Employed × Income							**−0.02**	**[−0.04, −0.01]**	**.001**
Child × Income							**0.00**	**[0.00, 0.01]**	**.011**
Health × Income							**−0.01**	**[−0.01, −0.00]**	**.017**
Childhood SES × Income							−0.00	[−0.01, 0.00]	.073
Constant	**4.68**	**[4.51, 4.84]**	**<.001**	**2.02**	**[1.50, 2.55]**	**<.001**	0.66	[−0.19, 1.50]	.126
Observations		6,603			5,674			5,674	
R^2		0.15			0.20			0.20	

Note. This table presents results from ordinary least squares (OLS) regression models predicting contemporaneous savings from optimism, income, their interaction, and covariates in Study 5 at T1 (2012–2014). The dependent variable, savings, is log-transformed. Bolded values indicate statistical significance at $p < .05$. M = model; CI = confidence interval; T = time; SES = socioeconomic status.

mutual funds (Christelis et al., 2005). The average nominal savings across all countries was €47,243.14, with significant cross-country variations (Table 18). Values were log-transformed to reduce skewness (Wave 1: $M = 7.60$, $SD = 4.28$).

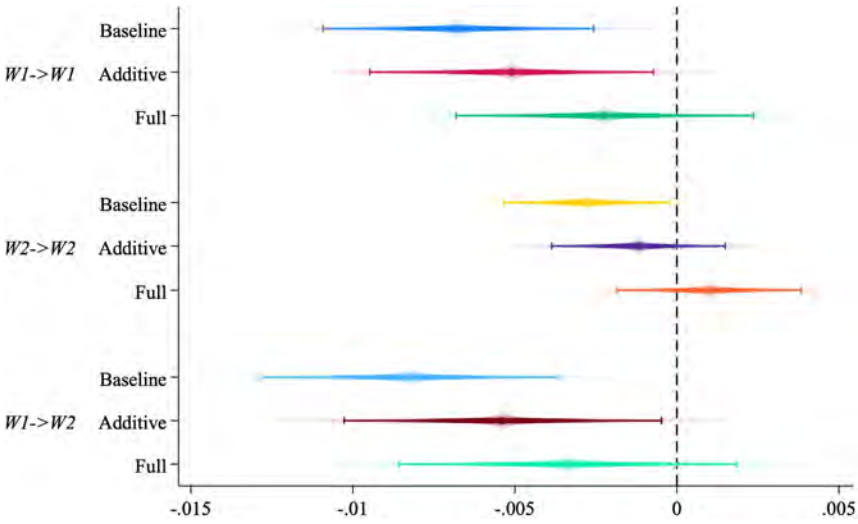
Covariates. Our analyses included age, gender, marital status, number of children, employment status, and self-reported health as covariates (see Table 19 for descriptive statistics).

Transparency and Openness

The sample size for this study was determined based on the available data, with all data exclusions fully reported. Data from the SHARE are accessible to researchers via the SHARE Research Data Center. The release versions can be accessed under https://doi.org/10.6103/SHARE.w1.800. The analysis code for

Figure 6

Coefficients Plot Showing Interaction Effects of Optimism and Income on Savings Across Time and Model Specifications (Study 5)



Note. Points represent coefficient estimates. Thick lines indicate 95% confidence interval, while thinner extensions show 99% confidence interval. The vertical dashed line at 0 helps visualize the significance of effects. W = wave. See the online article for the color version of this figure.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 18
Mean Savings by Country and Wave (Study 6)

	Wave 1			Wave 2			Wave 4		
Country	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Austria	1,569	23825.34	61184.39	1,200	27853.46	89326.03	5,255	25504.15	50376.47
Germany	2,997	43151.19	68561.65	2,628	49656.46	85510.35	1,621	52901.47	86446.09
Sweden	3,049	53698.19	74953.81	2,796	76602.98	98473.32	1,969	90163.83	111534.9
Netherlands	2,968	47690.93	78252.28	2,683	54511.06	94836.22	2,789	56682.29	88508.24
Spain	2,316	11065.59	39409.84	2,427	20880.34	66092.02	3,728	20842.95	109076.4
Italy	2,553	15117.16	37044.15	2,986	18674.81	39913.16	3,595	21422.03	47921.99
France	3,122	34433.9	109606.1	2,989	47602.17	81944.29	5,851	89214.61	361,856
Denmark	1,706	64200.22	111148.7	2,630	112898.5	161924.1	2,287	110956.8	150126.8
Greece	2,897	10980.08	25107.23	3,412	10964.29	48899.12			
Switzerland	997	120207.9	204911.4	1,498	137789.3	206841.1	3,788	186,550	259516.8
Belgium	3,810	56366.63	116,069	3,227	80632.9	126,215	5,324	98029.26	161525.4
Israel	2,450	30952.57	62767.63	2,447	86085.62	191713.3			
Czech Republic				2,750	5063.08	9297.146	5,539	7392.189	11598.98
Poland				2,466	1739.476	4230.845	1,733	4130.68	4305.125
Ireland				1,035	78439.38	282535.3			
Hungary							3,072	4303.911	17002.37
Portugal							2,020	23813.57	140933.3
Slovenia							2,749	5600.231	17129.36
Estonia							6,864	3498.345	15847.99

Note. This table presents mean savings by country across three waves of the Survey of Health, Ageing and Retirement in Europe study. All values are expressed in Euros (€). Wave 1 data were collected in 2004, Wave 2 in 2006, and Wave 4 in 2011. Wave 3 is not included as it focused on retrospective life histories and did not collect savings data. The variation in sample sizes across waves and countries reflects differences in survey participation and country-specific sampling strategies. For analytical purposes, savings values were log-transformed to address skewness in the distribution. *N* = number of participants; *M* = mean savings.

this study is publicly available on our OSF page at https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6. This study was not preregistered.

Analytic Strategy

Our analysis of the SHARE data employed multilevel mixed-effects models in Stata (Version 18) to account for the nested structure of the data (individuals within countries) and to leverage the longitudinal nature of the data set. To test Hypothesis 1b, which posits a positive association between optimism and savings, we used optimism as the predictor and log-transformed savings as the outcome. We ran these models for both contemporaneous and future savings, with a significant positive coefficient for optimism supporting Hypothesis 1b. To test Hypothesis 2, which predicts a stronger optimism–savings relationship for lower income individuals, we extended our models to include an interaction term between optimism and income. A significant negative coefficient for this interaction would support Hypothesis 2, indicating that the positive effect of optimism on savings decreases as income increases. We also report intraclass correlation coefficients to indicate the proportion of variance in savings attributable to country-level differences.

Table 19
Descriptive Statistics for Waves 1, 2, and 4 (Study 6)

	Wave 1					Wave 2					Wave 4				
Measure	*N*	*M*	*SD*	Min	Max	*N*	*M*	*SD*	Min	Max	*N*	*M*	*SD*	Min	Max
Optimism	19,864	3.58	0.60	1	5	8,793	3.53	0.60	1	5					
Income	30,434	43.02	63.16	0	4275.733	37,174	29.00	47.49	0	2824.13	58,184	33.68	53.95	0	2138.19
Age	30,434	64.20	10.57	26	103	37,174	65.16	10.41	15	104	58,184	65.96	10.39	24	111
Age^2	30,434	4233.04	1410.54	676	10,609	37,174	4353.65	1405.39	225	10,816	58,184	4458.06	1412.45	576	12,321
Female	30,434	1.56	0.50	1	2	37,174	1.56	0.50	1	2	58,184	1.57	0.50	1	2
In relationship	30,434	0.74	0.44	0	1	37,174	0.74	0.44	0	1	58,184	0.71	0.45	0	1
Employed	30,228	0.29	0.46	0	1	36,735	0.29	0.45	0	1	57,417	0.27	0.44	0	1
Child	30,434	2.28	1.58	0	17	37,174	2.29	1.50	0	17	58,184	2.16	1.35	0	17
Health	30,434	3.05	1.07	1	5	37,174	2.90	1.11	1	5	58,184	2.75	1.08	1	5

Note. This table presents descriptive statistics for key variables in Study 6 across three waves of the Survey of Health, Ageing and Retirement in Europe. Wave 1 data were collected in 2004, Wave 2 in 2006, and Wave 4 in 2011. Income is expressed in thousands of Euros (€) and represents annual household income. Age is measured in years. Binary variables are coded as follows: female (1 = male, 2 = female), in relationship (0 = not in a relationship, 1 = in a relationship), and employed (0 = not employed, 1 = employed). Child represents the number of children. Health is measured on a 5-point scale (1 = *poor*, 5 = *excellent*). Sample sizes (*N*) vary across variables and waves due to missing data and differences in survey participation. The increase in sample size from Wave 1 to Wave 4 reflects the addition of new countries to the SHARE study over time. *N* = number of participants; Min = minimum value; Max = maximum value.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Results

Associations Between Optimism and Savings

We employed multilevel mixed-effects analysis with random coefficients to examine the relationship between optimism and savings behavior across 14 European countries, accounting for the nested data structure. Results from Table 20 (Model 2) show that optimism at Time 1 positively and significantly predicted savings at Time 1, supporting Hypothesis 1b ($b = .25$, $z = 5.34$, 95% CI [.16, .35], $p < .001$). This indicates that more optimistic individuals tend to save more money, controlling for other factors.

The intraclass correlation coefficient of .136 suggests that ~14% of the variance in savings was explained by country membership, highlighting substantial between-country differences in saving behavior (Hox, 2010).

To assess robustness, we replicated the analysis using Time 2 (2006) measurements. Results in Tables 20 (Models 3 and 4) were consistent with Time 1 findings, with optimism at Time 2 positively predicting savings at Time 2 ($b = .18$, $z = 2.51$, 95% CI [.04, .31], $p = .012$). This consistency across time points strengthens the evidence for a concurrent relationship between optimism and savings.

Effects of Optimism on Subsequent Savings

Figure 7 illustrates the relationship between optimism and savings over time using multilevel mixed-effects analysis. The plot reveals a consistent positive association between optimism and savings across all time lags and model specifications, with coefficient estimates consistently to the right of the zero line. However, the magnitude of this effect diminishes as the time lag increases, evidenced by the gradual leftward shift of estimates from W1 → W1 to W2 → W4.

The inclusion of control variables generally reduces effect sizes, yet the positive association remains significant in most cases. The strongest effects are observed in contemporaneous (W1 → W1, W2 → W2) and short-term (W1 → W2) relationships, while longer term effects (W1 → W4, W2 → W4) show smaller but still significant magnitudes. This pattern is consistent whether optimism is measured at Wave 1 or Wave 2, suggesting stability in the optimism–savings relationship. The regression models presented in Table 21 provide further details on the effect of optimism on savings across different time lags and with varying levels of covariates.

Comparing Predictive Value of Optimism and Pessimism for Savings

In Study 6, both optimism and pessimism subscales significantly predicted savings across all time points (2004, 2006, and 2011), suggesting that individuals scoring higher on either subscale tended to have higher savings and assets. However, the relative predictive power of these constructs varied over time.

Wald tests comparing coefficient magnitudes revealed that pessimism had a stronger association with savings in 2011 when predicted from 2004 measures, W1:W4, $F(1, 8184) = 11.94$, $p < .001$. Conversely, optimism was a more robust predictor for savings in 2006 when measured concurrently, W2:W2, $F(1, 8440) = 9.50$, $p = .002$. For other time comparisons, the predictive strengths of optimism and pessimism did not differ significantly. These mixed results are detailed in Table 22.

Moderating Effect of Income

Our findings support Hypothesis 2, revealing a significant interaction between optimism and income levels. This interaction

Table 20

Results of Multilevel Mixed-Effects Models Predicting Savings (W1 and W2) From Optimism (W1 and W2) and Covariates (Study 6)

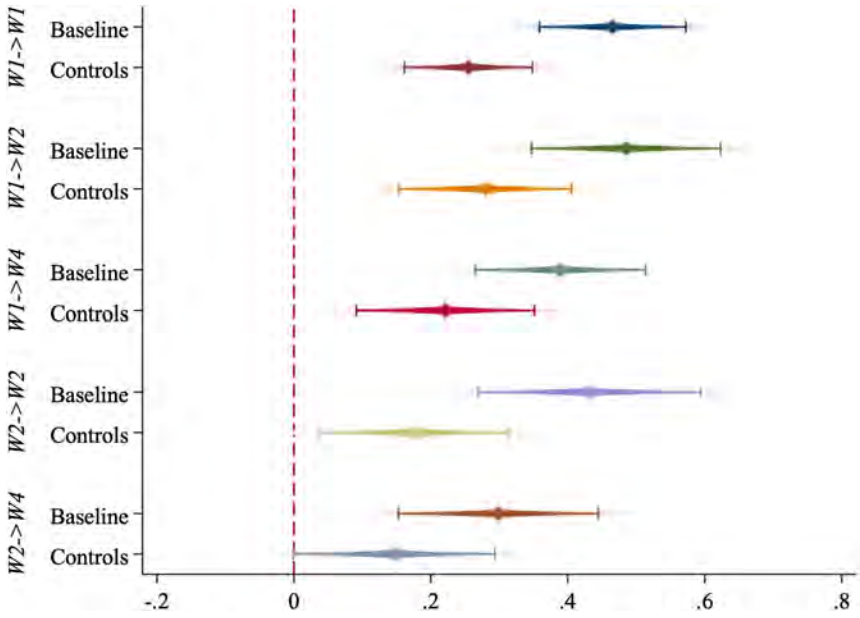
	(M1) W1 savings Unadjusted baseline			(M2) W1 savings Additive control			(M3) W2 savings Unadjusted baseline			(M4) W2 savings Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism (W1)	**0.47**	**[0.36, 0.57]**	**<.001**	**0.25**	**[0.16, 0.35]**	**<.001**						
Optimism (W2)							**0.43**	**[0.27, 0.59]**	**<.001**	**0.18**	**[0.04, 0.31]**	**.012**
Age				**0.08**	**[0.02, 0.14]**	**.006**				**0.13**	**[0.05, 0.22]**	**.003**
Age^2				**−0.00**	**[−0.00, −0.00]**	**.019**				**−0.00**	**[−0.00, −0.00]**	**.003**
Female				−0.08	[−0.19, 0.03]	.153				−0.12	[−0.28, 0.04]	.130
In relationship				**1.20**	**[1.07, 1.33]**	**<.001**				**1.19**	**[1.00, 1.38]**	**<.001**
Employed				**0.76**	**[0.62, 0.91]**	**<.001**				**1.10**	**[0.88, 1.31]**	**<.001**
Child				**−0.34**	**[−0.38, −0.31]**	**<.001**				**−0.19**	**[−0.25, −0.14]**	**<.001**
Health				**0.36**	**[0.30, 0.42]**	**<.001**				**0.41**	**[0.33, 0.49]**	**<.001**
Constant	**7.72**	**[6.85, 8.59]**	**<.001**	**3.28**	**[1.12, 5.44]**	**.003**	**7.91**	**[6.90, 8.92]**	**<.001**	1.72	[−1.34, 4.78]	.270
Random effects (σ)												
Optimism		Included			Included			Included			Included	
Observations		19,741			19,724			8,793			8,743	
Countries		12			12			14			14	
ICC		.136			.123			.210			.187	

Note. This table presents results from multilevel mixed-effects models predicting savings from optimism and covariates in Study 6. The dependent variable, savings, is log-transformed. Bolded values indicate statistical significance at $p < .05$. W1 refers to Wave 1 (2004) and W2 to Wave 2 (2006). Age and age^2 are continuous variables measured in years. Binary variables are coded as: female (0 = male, 1 = female), in relationship (0 = single, 1 = in a relationship), and employed (0 = unemployed, 1 = employed). Child represents the number of children. Health is measured on a 5-point scale (1 = *poor*, 5 = *excellent*). Models include random effects for optimism with unstructured covariance, allowing the effect of optimism to vary across countries. The intraclass correlation coefficient (ICC) indicates the proportion of variance in savings explained by country-level differences. M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 7

Coefficients Plot of the Effect of Optimism on Savings by Time Lag With and Without Covariates (Study 6)



Note. Models include random effects for optimism, and unstructured covariances. Points represent coefficient estimates. Thick lines indicate 95% confidence interval, while thinner extensions show 99% confidence interval. W = wave. See the online article for the color version of this figure.

persists across different time points and model specifications, as illustrated in Figures 8 and 9.

Figure 8 provides a clear visual representation of this interaction at Wave 1. The steeper slope for lower income individuals, 10th percentile: $b = 0.40$, $t(3298) = 6.26$, $p < .001$, 95% CI [0.28, 0.53], compared to higher income individuals, 90th percentile: $b = 0.20$, $t(3298) = 2.43$, $p = .015$, 95% CI [0.04, 0.36], illustrates that the positive effect of optimism on savings is more pronounced among those with lower incomes.

Figure 9 extends this analysis across different time points and model specifications. The consistent negative interaction coefficients across all models indicate that the positive relationship between optimism and savings is consistently stronger for lower income individuals. This pattern holds true for both contemporaneous (W1 → W1, W2 → W2) and longitudinal (W1 → W2, W1 → W4, W2 → W4) relationships. Notably, the interaction effect remains significant even after controlling for various covariates. This robustness suggests that the moderating effect of income on the optimism–savings relationship is not merely an artifact of other socioeconomic factors.

Study 7: Longitudinal Within-Person Evidence From Understanding Society

Method

Data Set and Participants

Study 7 utilized data from Understanding Society, a nationally representative panel survey of 40,000 households in the United Kingdom. This ongoing survey, initiated in 2009, collects annual data on various socioeconomic factors. Our analysis focused on waves that included measures of income, savings, and optimism (see Tables 23). While income and savings were assessed in each wave, optimism was measured in five specific waves, allowing for longitudinal within-person analysis. Despite its advantages, potential attrition bias, as documented by Cabrera-Álvarez and Lynn (2023), should be considered when interpreting results.

Measures

Optimism. Dispositional optimism was assessed using a single item from the Warwick–Edinburgh Mental Well-Being Scale (Tennant et al., 2007): "I've been feeling optimistic about the future." Participants rated their optimism over the previous 2 weeks on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Higher scores indicated greater optimism ($M = 3.26$, $SD = 0.96$). While this single-item measure provided a concise assessment of optimism, it precluded separate analysis of optimism and pessimism constructs.

Income. Annual household income was calculated by aggregating various income sources for each household member. These sources included wages, social security benefits, pensions, public assistance, other government programs, child support, and additional income streams. The resulting mean annual income was £19,793.48 (SD = £18,498.58). For analytical purposes, income is reported in units of £1,000.

Savings Measures. The study employed four distinct measures to capture various aspects of saving behavior. (a) "Has Savings" is a

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 21

Results of Multilevel Mixed-Effects Models Predicting Savings (W2 and W4) From Optimism (W1 and W2) and Covariates (Study 6)

	(M1) W2 savings Unadjusted baseline			(M2) W2 savings Additive control			(M3) W4 savings Unadjusted baseline			(M4) W4 savings Additive control			(M5) W4 savings Unadjusted baseline			(M6) W4 savings Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism (W1)	**0.48**	**[0.35, 0.62]**	**<.001**	**0.28**	**[0.15, 0.41]**	**<.001**	**0.39**	**[0.27, 0.51]**	**<.001**	**0.22**	**[0.09, 0.35]**	**.001**						
Optimism (W2)										**0.09**	**[0.01, 0.18]**	**.031**	**0.30**	**[0.15, 0.44]**	**<.001**	**0.15**	**[−0.00, 0.29]**	**.051**
Age				0.05	[−0.01, 0.12]	.109				**−0.00**	**[−0.00, −0.00]**	**.017**				**0.21**	**[0.11, 0.32]**	**<.001**
Age^2				−0.00	[−0.00, 0.00]	.129				**−0.19**	**[−0.31, −0.06]**	**.004**				**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				−0.02	[−0.14, 0.10]	.762				**0.97**	**[0.82, 1.13]**	**<.001**				−0.04	[−0.21, 0.12]	.604
In relationship				**1.20**	**[1.06, 1.34]**	**<.001**				**0.47**	**[0.30, 0.64]**	**<.001**				**0.72**	**[0.51, 0.93]**	**<.001**
Employed				**0.71**	**[0.55, 0.86]**	**<.001**				**−0.18**	**[−0.22, −0.13]**	**<.001**				**0.70**	**[0.47, 0.93]**	**<.001**
Child				**−0.34**	**[−0.38, −0.30]**	**<.001**				**0.28**	**[0.22, 0.35]**	**<.001**				**−0.17**	**[−0.23, −0.11]**	**<.001**
Health				**0.34**	**[0.28, 0.40]**	**<.001**				**0.09**	**[0.01, 0.18]**	**.031**				**0.30**	**[0.21, 0.38]**	**<.001**
Constant	**8.29**	**[7.27, 9.31]**	**<.001**	**5.06**	**[2.58, 7.53]**	**<.001**	**9.15**	**[8.38, 9.91]**	**<.001**	**5.39**	**[2.53, 8.25]**	**<.001**	**8.81**	**[8.12, 9.51]**	**<.001**	0.84	[−2.70, 4.38]	.643
Random effects (σ)																		
Optimism		Included			Included			Included			Included			Included			Included	
Observations		14,341			14,335			8,523			8,517			4,478			4,459	
Countries		12			12			10			10			12			12	
ICC		.202			.199			.151			.142			.157			.143	

Note. This table presents results from multilevel mixed-effects models predicting savings from optimism and covariates in Study 6. The dependent variable, savings, is log-transformed. Bolded values indicate statistical significance at $p < .05$. W1, W2, and W4 refer to Wave 1 (2004), Wave 2 (2006), and Wave 4 (2011), respectively. Age and Age^2 are continuous variables measured in years. Binary variables are coded as: Female (0 = male, 1 = female), In Relationship (0 = single, 1 = in a relationship), and Employed (0 = unemployed, 1 = employed). Child represents the number of children. Health is measured on a 5-point scale (1 = poor, 5 = excellent). Models include random effects for optimism with unstructured covariance, allowing the effect of optimism to vary across countries. The Intraclass Correlation Coefficient (ICC) indicates the proportion of variance in savings explained by country-level differences. Observations vary due to missing data and attrition. The number of countries varies (10–12) as some countries joined or left the study across waves. M = model; CI = confidence interval.

Table 22
Standardized Regression Coefficients for Optimism and Pessimism Subscales Predicting Savings (Waves 1–4; Study 6)

	Optimism		Pessimism		Wald test (pessimism vs. optimism)	
Time period	β	*p*	β	*p*	*F* (*df*)	*p*
W1–W1	**.09**	**<.001**	**.10**	**<.001**	2.02 (1, 18,974)	.155
W1–W2	**.11**	**<.001**	**.98**	**<.001**	0.67 (1, 13,797)	.414
W1–W4	**.09**	**<.001**	**.15**	**<.001**	**11.94 (1, 8,184)**	**<.001**
W2–W2	**.19**	**<.001**	**.14**	**<.001**	**9.50 (1, 8,440)**	**.002**
W2–W4	**.11**	**<.001**	**.13**	**<.001**	0.20 (1, 4,311)	.658

Note. This table presents standardized regression coefficients (β) for optimism and pessimism subscales predicting savings across different waves in Study 6. W1, W2, and W4 refer to Wave 1 (2004), Wave 2 (2006), and Wave 4 (2011), respectively. The dependent variable, savings, is log-transformed in all analyses. Both subscales are coded so that higher scores indicate greater optimism (i.e., pessimism items are reverse-scored). Time periods (e.g., W1–W2) indicate the wave of the predictor (optimism/pessimism) and outcome (savings) variables, respectively. The Wald Test compares the magnitude of the pessimism coefficient to the optimism coefficient. *F*(*df*) shows the *F*-statistic and degrees of freedom for this test. A significant *p* value (<.05) indicates that the coefficients for pessimism and optimism are statistically different. Bolded values indicate statistical significance at $p < .05$.

binary measure indicating whether participants possessed any savings, providing insight into the fundamental propensity to save. (b) "Frequent Saver" is a binary measure assessing the regularity of saving behavior, potentially reflecting habitual financial practices. (c) "Recurring Savings" quantifies the average monthly amount saved, measuring saving intensity. Participants reported this by answering, "About how much on average do you personally manage to save a month?" (d) "Aggregate Savings" represents the total accumulated savings across all accounts designated for savings, reflecting long-term saving outcomes. The variables used to derive these measures are listed in online Supplemental Materials G.

Over the study period, average aggregate savings increased from £19,117.63 (*SD* = 49,017.67) in Wave 4 to £40,666.63 (*SD* = 98,872.95) in Wave 13. To account for skewed distributions, both Recurring Savings (*M* = 4.82, *SD* = 1.24) and Aggregate Savings (*M* = 1.58, *SD* = 2.60) were log-transformed for analysis. See Table 24 for the mean values across waves.

Covariates. Several covariates were included to control for potential confounds: age (*M* = 47.46, *SD* = 18.61), age^2, gender (54.1% female), employment status (53.9% in paid work), marital status (53.6% married), number of children in the household (*M* = 0.72, *SD* = 1.08), and subjective satisfaction with health (1–7 scale, *M* = 4.76, *SD* = 1.73).

Table 24 presents descriptive statistics for key measures across the 13 waves of the survey, including sample sizes, means, and standard deviations for income, optimism, and the four savings measures.

Transparency and Openness

The sample size for this study was determined based on the available data, with all exclusions reported. The Understanding Society data set is publicly accessible via the U.K. Data Service (https://doi.org/10.5255/UKDA-Series-2000053) for researchers who register and comply with the terms of use. Detailed documentation and resources can be found on the official Understanding Society website (https://www.understandingsociety.ac.uk). The analysis code used in this study is available on the OSF at https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6. This study was not preregistered.

Analytic Strategy

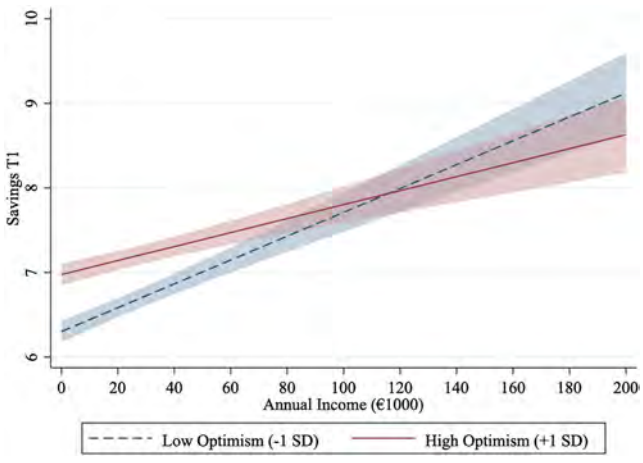
Our analysis of the Understanding Society data set employed fixed-effects regression models in Stata (Version 18) to leverage the longitudinal nature of the data and isolate within-person effects. This approach provides a stronger test of our hypotheses by controlling for all time-invariant individual characteristics, whether observed or unobserved (Allison, 2009; Angrist & Pischke, 2009). The fixed-effects model can be expressed as:

$$\text{Savings}_{it} = \beta_1 \text{Optimism}_{it} + \beta_2 Z_{it} + \alpha_i + \varepsilon_{it}, \quad (1)$$

where Savings_{it} is the savings measure for individual *i* at time *t*, β_1 Optimism_{it} is the optimism score, β_2 Z_{it} represents a vector of time-varying covariates, α_i represents all time-invariant characteristics of the individual, and ε_{it} is the error term. The key feature of this model is α_i, which captures all stable individual differences such as personality traits, childhood experiences, or genetic factors that might influence both optimism and saving behavior. By focusing on within-person changes over time, the model effectively "differences out" these stable characteristics, allowing us to estimate the effect of changes in optimism on changes in savings within the same individual (Wooldridge, 2010).

This approach represents a stronger test of our hypotheses compared to cross-sectional analyses because it eliminates the potential confounding influence of any time-invariant individual characteristics. For instance, if more conscientious individuals tend

Figure 8
Interaction Between Income and Optimism on Savings for Wave 1 (Study 6)

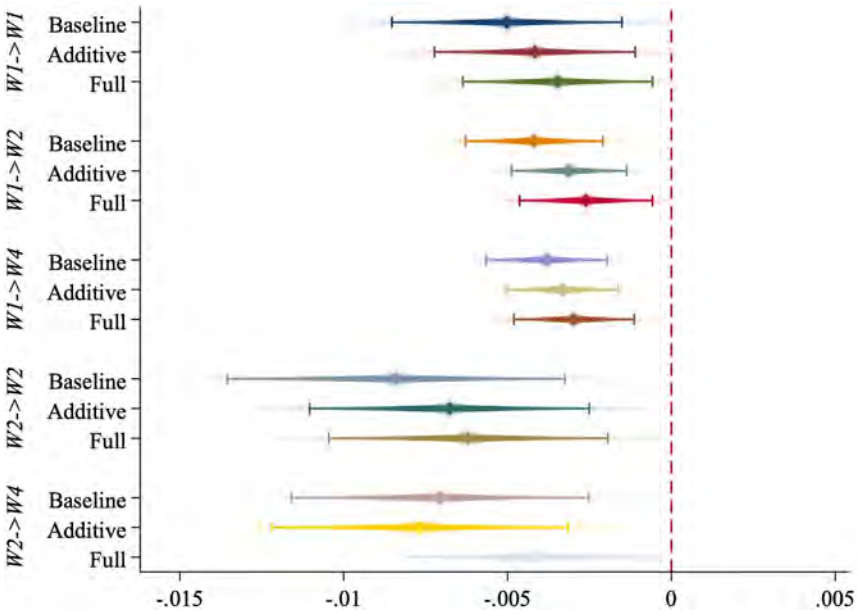


Note. Shaded regions indicate 95% confidence interval. The model includes country-level fixed effects for 14 countries. T = time. See the online article for the color version of this figure.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 9

Coefficients Plot of the Moderating Effect of Income on Optimism for Savings, With and Without Covariates (Study 6)



Note. Points represent coefficient estimates. Thick lines indicate 95% confidence interval, while thinner extensions show 99% confidence interval. W = wave. See the online article for the color version of this figure.

to be both more optimistic and better savers, a cross-sectional analysis might incorrectly attribute the effect of conscientiousness to optimism. The fixed-effects model, by controlling for all stable individual differences, provides a more accurate estimate of the unique effect of optimism on savings.

To test Hypothesis 2, we extended our model to include an interaction term:

$$\text{Savings}_{it} = \beta_1 \text{Optimism}_{it} + \beta_2 \text{Income}_{it} + \beta_3 \text{Optimism}_{it} \times \text{Income}_{it} + \beta_4 Z_{it} + \alpha_i + \varepsilon_{it}. \quad (2)$$

Here, β_3 represents how the within-person effect of optimism on savings varies with income. A significant negative β_3 would support Hypothesis 2, indicating that the positive effect of optimism on

Table 23

Timing of Measurements for Income, Optimism, and Savings (Study 7)

			Subjective		Amount ($)	
Wave	Income	Optimism	Has saving	Frequent saver	Recurring saving	Aggregate saving
1	✓	✓	—	—	—	—
2	✓	—	✓	✓	✓	—
3	✓	—	—	—	—	—
4	✓	✓	✓	✓	✓	✓
5	✓	—	—	—	—	—
6	✓	—	✓	✓	✓	—
7	✓	✓	—	—	—	—
8	✓	—	✓	✓	✓	✓
9	✓	—	—	—	—	—
10	✓	✓	✓	✓	✓	—
11	✓	—	—	—	—	—
12	✓	—	—	—	—	—
13	✓	✓	✓	✓	✓	✓

Note. This table presents the timing of measurements for key variables across 13 waves of the Understanding Society study (Study 7). ✓ indicates that the variable was measured in that wave, while — indicates it was not measured. The variation in measurement frequency across variables allows for both contemporaneous and lagged analyses of the relationship between optimism and different aspects of saving behavior.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 24
Descriptive Statistics for Income, Optimism, and Savings (Study 7)

	Income			Optimism			Has saving		
Wave	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
1	50,994	17.54	17.62	39,349	3.31	0.96			
2	54,569	18.38	17.31				50,540	0.45	0.50
3	49,692	19.12	17.88						
4	47,071	19.57	18.16	39,130	3.12	0.95	42,962	0.46	0.50
5	44,833	19.92	18.22						
6	45,188	20.63	19.10				37,047	0.51	0.50
7	42,168	21.08	19.32	37,552	3.37	0.96			
8	39,293	21.52	19.55				37,084	0.45	0.50
9	36,055	21.75	19.57						
10	34,317	22.23	20.11	32,021	3.17	0.90	32,966	0.50	0.50
11	32,006	22.88	20.49						
12	29,267	23.68	20.67						
13	27,998	24.08	21.16	27,354	3.18	0.90	27,147	0.56	0.50

	Frequent saver			Recurring savings			Aggregate savings		
Wave	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
1									
2	20,514	0.72	0.45	18,508	217.19	576.76			
3									
4	18,120	0.73	0.44	16,466	244.57	694.68	22,958	19117.63	49017.67
5									
6	17,254	0.72	0.45	15,047	277.32	833.95			
7									
8	15,095	0.71	0.45	12,896	302.99	651.48	19,005	30766.40	78951.67
9									
10	15,172	0.70	0.46	13,173	286.41	514.21			
11									
12									
13	12,116	0.69	0.46	10,260	378.33	856.25	16,174	40666.63	98872.95

Note. This table presents descriptive statistics for key variables across 13 waves of the Understanding Society study (Study 7). Income is expressed in 1,000s of Great Britain Pounds (£) and represents annual household income. Sample sizes (*N*) vary across variables and waves due to missing data, attrition, and differences in measurement frequency. For binary measures (Has Savings, Frequent Saver), the mean represents the proportion of participants answering affirmatively. *N* = number of participants.

savings decreases as income increases, even when controlling for all stable individual differences. The inclusion of time-varying covariates ($\beta_4 Z_{it}$) further strengthens our confidence in the observed relationships by accounting for changes in factors like relationship status, employment, and health.

Specifically, this interaction term captures whether the relationship between changes in an individual's optimism and changes in their savings behavior is moderated by concurrent changes in their income. This is fundamentally different from the cross-sectional analyses in previous studies, which examined how the optimism–savings relationship varied across individuals with different income levels.

In the fixed-effects model, a significant negative β_3 would indicate that as an individual's income increases over time, the positive effect of their optimism on their savings tends to decrease. Conversely, during periods when the same individual has lower income, the positive relationship between their optimism and savings would be stronger.

We applied these models to four savings outcomes: binary measures of having any savings and being a frequent saver, and log-transformed measures of recurring and aggregate savings. For binary outcomes, we used linear probability models to maintain the fixed-effects approach.

We restricted our fixed-effects approach to variables with at least three waves of data, ensuring reliable estimates and enabling tests for assumption violations. By focusing on within-person changes and controlling for all stable individual differences, this fixed-effects approach provides a more rigorous test of our hypotheses, strengthening causal inference. However, it is important to note that this method cannot account for time-varying confounds not included in the model, and it reduces our ability to examine effects of time-invariant characteristics.

To complement our fixed-effects analyses, we also utilized multilevel models with random intercepts, offering an assessment of the optimism–savings association that incorporates between-person differences while accounting for data clustering (Raudenbush, 2002). This dual approach provides a deeper understanding of both within-person changes and overall relationships.

Results

Multilevel Analysis of Optimism's Contemporaneous Effects on Savings

We begin by examining the relationship between optimism and savings using multilevel mixed-effects models with random intercepts. These models account for the nested structure of the data, with annual observations nested within participants. The results,

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

presented in Table 25, reveal that optimism had a positive and significant effect on all four measures of savings, supporting Hypothesis 1b. Specifically, a one-unit increase in optimism was associated with a 4% point increase in the likelihood of having any amount of savings ($b = 0.04$, $z = 25.06$, 95% CI [0.04, 0.05], $p < .001$), a 2% point increase in the likelihood of being a frequent saver ($b = 0.02$, $z = 8.59$, 95% CI [0.02, 0.03], $p < .001$), a 0.11 increase in log-transformed recurring savings ($b = 0.11$, $z = 14.85$, 95% CI [0.09, 0.12], $p < .001$), and a 0.13 increase in log-transformed aggregate savings ($b = 0.13$, $z = 8.12$, 95% CI [0.10, 0.17], $p < .001$). These effects remained significant after controlling for the covariates.

Stability and Change in Dispositional Optimism

Our analysis of dispositional optimism's temporal characteristics revealed moderate stability and within-person variability. A random-effects model yielded a rank-order stability coefficient of 0.4415, indicating that 44.15% of the variance in optimism scores was attributable to stable individual differences. This suggests individuals largely maintain their relative position in the optimism distribution over time, while allowing for change.

A linear growth model quantified mean-level change, with a fixed-effects coefficient for time of 0.005 ($p = .398$). This nonsignificant result indicates no systematic increase or decrease in optimism levels across study waves. However, we observed notable within-person variability in optimism scores, crucial for applying fixed-effects models that leverage individual changes over time.

This pattern of moderate rank-order stability, negligible mean-level change, and substantial within-person variability justifies our use of fixed-effects models. These models can isolate the relationship between changes in an individual's optimism and saving behavior while controlling for time-invariant characteristics. Consequently, any observed effects of optimism on savings likely stem from within-person fluctuations rather than population-level shifts in optimism.

Within-Person Analyses of Optimism's Effects on Savings

Our fixed-effects regression models revealed significant associations between changes in optimism and savings behavior within individuals over time. For the binary outcome of having savings, a one-unit increase in optimism was associated with a 1% increase in the likelihood of having savings ($b = 0.01$, $t = 3.12$, 95% CI [0.00, 0.01], $p = .002$). This effect persisted after controlling for time-varying covariates. Similarly, a one-unit increase in optimism corresponded to a 1% increase in the probability of being a frequent saver ($b = 0.01$, $t = 2.77$, 95% CI [0.00, 0.02], $p = .006$).

Table 25

Results of Multilevel Mixed-Effects Models Predicting Savings From Optimism and Covariates (Study 7)

	(M1) Has saving Unadjusted baseline			(M2) Has saving Additive control			(M3) Frequent saver Unadjusted baseline			(M4) Frequent saver Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.04**	**[0.04, 0.05]**	**<.001**	**0.03**	**[0.03, 0.03]**	**<.001**	**0.02**	**[0.02, 0.03]**	**<.001**	**0.02**	**[0.01, 0.02]**	**<.001**
Age				**0.01**	**[0.01, 0.01]**	**<.001**				**0.01**	**[0.01, 0.01]**	**<.001**
Age^2				**−0.00**	**[−0.00, −0.00]**	**<.001**				**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				−0.01	[−0.01, 0.00]	.149				0.00	[−0.01, 0.01]	.728
In relationship				**0.05**	**[0.04, 0.05]**	**<.001**				0.01	[−0.00, 0.02]	.065
Employed				**0.23**	**[0.22, 0.24]**	**<.001**				**0.10**	**[0.09, 0.11]**	**<.001**
Child				**−0.05**	**[−0.05, −0.04]**	**<.001**				**−0.02**	**[−0.03, −0.02]**	**<.001**
Health				**0.02**	**[0.02, 0.02]**	**<.001**				0.00	[−0.00, 0.00]	.095
Constant	**0.36**	**[0.35, 0.37]**	**<.001**	0.01	[−0.02, 0.03]	.700	**0.63**	**[0.61, 0.65]**	**<.001**	**0.36**	**[0.32, 0.40]**	**<.001**
Obs		97,425			96,703			43,777			43,486	
N		51,325			51,017			28,065			27,890	

	(M5) Recurring saving Unadjusted baseline			(M6) Recurring saving Additive control			(M7) Aggregate saving Unadjusted baseline			(M8) Aggregate saving Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.11**	**[0.09, 0.12]**	**<.001**	**0.09**	**[0.08, 0.10]**	**<.001**	**0.13**	**[0.10, 0.17]**	**<.001**	**0.19**	**[0.15, 0.22]**	**<.001**
Age				**0.04**	**[0.03, 0.04]**	**<.001**				**0.10**	**[0.09, 0.11]**	**<.001**
Age^2				**−0.00**	**[−0.00, −0.00]**	**<.001**				**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				**−0.27**	**[−0.30, −0.24]**	**<.001**				**−0.24**	**[−0.30, −0.18]**	**<.001**
In relationship				**0.17**	**[0.14, 0.20]**	**<.001**				**0.42**	**[0.36, 0.49]**	**<.001**
Employed				**0.51**	**[0.48, 0.54]**	**<.001**				**0.38**	**[0.32, 0.45]**	**<.001**
Child				**−0.14**	**[−0.15, −0.12]**	**<.001**				**−0.39**	**[−0.42, −0.36]**	**<.001**
Health				**0.03**	**[0.03, 0.04]**	**<.001**				**0.14**	**[0.12, 0.16]**	**<.001**
Constant	**4.59**	**[4.54, 4.63]**	**<.001**	**3.61**	**[3.50, 3.73]**	**<.001**	**7.48**	**[7.37, 7.58]**	**<.001**	**3.13**	**[2.88, 3.38]**	**<.001**
Obs		38,619			38,372			37,588			37,315	
N		25,540			25,383			29,438			29,241	

Note. This table presents results from multilevel mixed-effects models predicting various savings measures from optimism and covariates in Study 7. Bolded values indicate statistical significance at $p < .05$. Obs = total number of observations across all waves; *N* = number of unique participants; M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Regarding recurring savings, a one-unit increase in optimism was associated with a 3% increase in log-transformed recurring savings ($b = 0.03$, $t = 2.45$, 95% CI [0.01, 0.05], $p = .014$). This within-person effect reduced slightly in size after controlling for time-varying covariates ($b = 0.02$, $t = 1.94$, 95% CI [−0.00, 0.05], $p = .053$). Table 26 presents the detailed results of these fixed-effects models.

Multilevel Analysis of the Moderating Role of Income

Our multilevel mixed-effects models revealed a significant interaction between optimism and income in predicting savings outcomes, supporting Hypothesis 2. As shown in Table 27, this interaction was consistent across all four savings measures (Has Savings: $b = -.001$, $z = -6.45$, 95% CI [−0.00, −0.00], $p < .001$; Frequent Saver: $b = -.003$, $z = -3.05$, 95% CI [−0.00, −0.00], $p = .002$; Recurring Savings: $b = -.001$, $z = -3.30$, 95% CI [−0.00, −0.00], $p = .001$; Aggregate Savings: $b = -.002$, $z = -2.76$, 95% CI [−0.00, −0.00], $p = .006$). These results indicate that the positive effect of optimism on savings is more pronounced among individuals with lower incomes.

To illustrate the practical significance of this interaction, we examined the effect of optimism on aggregate savings at different income levels. For individuals at the 10th income percentile, the effect of optimism was strong ($b = 0.13$, $z = 5.44$, $p < .001$, 95% CI [0.08, 0.17]), while for those at the 90th income percentile, the effect was weaker but still significant ($b = 0.05$, $z = 2.27$, $p = .023$, 95% CI [0.01, 0.09]). Figure 10 visually depicts this interaction for aggregate savings, clearly showing the steeper slope of the optimism–savings relationship at lower income levels.

Within-Person Analyses of Moderating Role of Income

To further explore the relationship between optimism and savings, we extended our fixed-effects models to include income and its interaction with optimism. While optimism consistently predicted higher savings across models, even after controlling for income fluctuations, the interaction between optimism and income yielded mixed outcomes. The interaction was significant for the likelihood of having savings ($b = -.0002$, $z = -2.04$, 95% CI [−0.00, −0.00], $p = .041$) and frequent saving ($b = -.001$, $z = -3.05$, 95% CI [−0.00, −0.00], $p = .018$), but not for recurring savings ($b = .0002$, $z = 0.41$, 95% CI [−0.00, 0.00], $p = .406$). This inconsistency suggests that income's moderating role may be less pronounced or more measurement-sensitive when examining within-person changes over time, compared to between-person differences observed in our multilevel analyses.

Our findings support a positive link between optimism and savings (Hypothesis 1b) at both between-person and within-person levels. However, the fixed-effects models indicate that income's moderating role may be less apparent in within-person analyses compared to between-person patterns (Table 28). This underscores the importance of considering both levels when studying psychological factors' impact on financial outcomes, as association patterns may differ across analytical levels.

Table 26

Results of Fixed-Effects Models Predicting Within-Person Changes in Savings From Optimism and Covariates (Study 7)

	(M1) Has saving Unadjusted baseline			(M2) Has saving Additive control			(M3) Frequent saver Unadjusted baseline		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.01**	**[0.00, 0.01]**	**.002**	**0.01**	**[0.00, 0.01]**	**.008**	**0.01**	**[0.00, 0.02]**	**.006**
In relationship				**0.02**	**[0.00, 0.04]**	**.020**			
Employed				**0.15**	**[0.14, 0.16]**	**<.001**			
Child				**−0.01**	**[−0.02, −0.00]**	**.003**			
Health				**0.00**	**[0.00, 0.01]**	**.005**			
Constant	**0.48**	**[0.47, 0.50]**	**<.001**	**0.39**	**[0.37, 0.41]**	**<.001**	**0.67**	**[0.64, 0.70]**	**<.001**
Obs		97,425			96,715			43,777	
N		51,325			51,024			28,065	

	(M4) Frequent saver Additive control			(M5) Recurring saving Unadjusted baseline			(M6) Recurring saving Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.01**	**[0.00, 0.02]**	**.009**	**0.03**	**[0.01, 0.05]**	**.014**	**0.02**	**[−0.00, 0.05]**	**.053**
In relationship	−0.02	[−0.04, 0.01]	.202				**0.11**	**[0.04, 0.18]**	**.002**
Employed	**0.08**	**[0.06, 0.10]**	**<.001**				**0.38**	**[0.33, 0.43]**	**<.001**
Child	−0.01	[−0.02, 0.00]	.126				**−0.13**	**[−0.17, −0.09]**	**<.001**
Health	0.00	[−0.00, 0.01]	.271				**0.02**	**[0.00, 0.03]**	**.011**
Constant	**0.63**	**[0.59, 0.67]**	**<.001**	4.90	[4.82, 4.97]	**<.001**	**4.61**	**[4.51, 4.72]**	**<.001**
Obs		43,492			38,619			38,378	
N		27,895							

Note. This table presents results from fixed-effects models predicting within-person changes in savings from optimism and covariates in Study 7. Bolded values indicate statistical significance at $p < .05$. Fixed-effects models control for all time-invariant individual characteristics, whether observed or unobserved. Thus, coefficients represent the effect of within-person changes in the predictor on within-person changes in the outcome. Obs = total number of observations across all waves; *N* = number of unique participants; M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 27

Results of Multilevel Mixed-Effects Models Predicting Savings From Optimism, Income, Their Interaction, and Covariates (Study 7)

	(M1) Has saving Unadjusted baseline			(M2) Has saving Additive control			(M3) Has saving Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.05**	**[0.04, 0.05]**	**<.001**	**0.03**	**[0.03, 0.04]**	**<.001**	**0.03**	**[0.03, 0.04]**	**<.001**
Income	**0.01**	**[0.01, 0.01]**	**<.001**	**0.01**	**[0.01, 0.01]**	**<.001**	**0.01**	**[0.01, 0.01]**	**<.001**
Optimism × Income	**−0.00**	**[−0.00, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**<.001**
Age				**0.00**	**[0.00, 0.01]**	**<.001**	**0.00**	**[0.00, 0.01]**	**<.001**
Age^2				**−0.00**	**[−0.00, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				**0.03**	**[0.02, 0.03]**	**<.001**	**0.01**	**[0.00, 0.02]**	**.028**
Married				**0.04**	**[0.04, 0.05]**	**<.001**	**0.07**	**[0.06, 0.08]**	**<.001**
Employed				**0.16**	**[0.15, 0.17]**	**<.001**	**0.18**	**[0.17, 0.19]**	**<.001**
Number children				**−0.05**	**[−0.06, −0.05]**	**<.001**	**−0.05**	**[−0.06, −0.05]**	**<.001**
Health				**0.02**	**[0.01, 0.02]**	**<.001**	**0.02**	**[0.02, 0.02]**	**<.001**
Age × Income							−0.00	[−0.00, 0.00]	.129
Age^2 × Income							0.00	[−0.00, 0.00]	.745
Female × Income							**0.00**	**[0.00, 0.00]**	**<.001**
In Relationship × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Employed × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Child × Income							−0.00	[−0.00, 0.00]	.626
Health × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Constant	**0.22**	**[0.20, 0.23]**	**<.001**	0.01	[−0.02, 0.04]	.638	−0.01	[−0.05, 0.03]	.684
Obs		97,424			96,702			96,702	
N		51,325			51,017			51,017	

	(M4) Frequent saver Unadjusted baseline			(M5) Frequent saver Additive control			(M6) Frequent saver Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.03**	**[0.02, 0.03]**	**<.001**	**0.02**	**[0.02, 0.03]**	**<.001**	**0.02**	**[0.01, 0.03]**	**<.001**
Income	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**	**0.01**	**[0.01, 0.01]**	**<.001**
Optimism × Income	**−0.00**	**[−0.00, −0.00]**	**.002**	**−0.00**	**[−0.00, −0.00]**	**.014**	**−0.00**	**[−0.00, 0.00]**	**.053**
Age				**0.01**	**[0.01, 0.01]**	**<.001**	**0.01**	**[0.01, 0.01]**	**<.001**
Age^2				**−0.00**	**[−0.00, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				**0.02**	**[0.01, 0.03]**	**.001**	0.00	[−0.01, 0.02]	.833
Married				0.01	[−0.00, 0.02]	.090	**0.03**	**[0.02, 0.05]**	**<.001**
Employed				**0.07**	**[0.06, 0.08]**	**<.001**	**0.09**	**[0.07, 0.11]**	**<.001**
Number children				**−0.02**	**[−0.03, −0.02]**	**<.001**	**−0.03**	**−0.03, −0.02]**	**<.001**
Health				0.00	[−0.00, 0.00]	.240	**0.01**	**[0.00, 0.01]**	**.008**
Age × Income							**−0.00**	**[−0.00, −0.00**	**<.001**
Age^2 × Income							**0.00**	**[0.00, 0.00]**	**.002**
Female × Income							**0.00**	**[0.00, 0.00]**	**.024**
In Relationship × Income							**−0.00**	**[−0.00, −0.00]**	**.001**
Employed × Income							**−0.00**	**−0.00, −0.00]**	**<.001**
Child × Income							0.00	[−0.00, 0.00]	.504
Health × Income							−0.00	**[−0.00, −0.00]**	**.015**
Constant	0.55	[0.53, 0.58]	<.001	**0.35**	**[0.31, 0.40]**	**<.001**	0.25	**[0.19, 0.31]**	**<.001**
Obs		43,776			43,485			43,485	
N		28,065			27,890			27,890	

	(M7) Recurring saving Unadjusted baseline			(M8) Recurring saving Additive control			(M9) Recurring saving Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.10**	**[0.08, 0.12]**	**<.001**	**0.09**	**[0.07, 0.11]**	**<.001**	**0.08**	**[0.06, 0.10]**	**<.001**
Income	**0.03**	**[0.02, 0.03]**	**<.001**	**0.02**	**[0.02, 0.03]**	**<.001**	**0.09**	**[0.08, 0.09]**	**<.001**
Optimism × Income	**−0.00**	**[−0.00, −0.00]**	**.001**	**−0.00**	**[−0.00, −0.00]**	**.002**	**−0.00**	**[−0.00, −0.00]**	**.020**
Age				**0.01**	**[0.00, 0.01]**	**.001**	**0.04**	**[0.03, 0.04]**	**<.001**
Age^2				**−0.00**	**[−0.00, −0.00]**	**.014**	**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				**−0.08**	**[−0.11, −0.06]**	**<.001**	**−0.14**	**[−0.18, −0.10]**	**<.001**
Married				**0.17**	**[0.14, 0.20]**	**<.001**	**0.34**	**[0.29, 0.39]**	**<.001**
Employed				**0.22**	**[0.19, 0.25]**	**<.001**	**0.21**	**[0.17, 0.25]**	**<.001**

(*table continues*)

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 27 (*continued*)

Predictor	(M7) Recurring saving Unadjusted baseline			(M8) Recurring saving Additive control			(M9) Recurring saving Full control		
	b	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Number children				**−0.16**	**[−0.17, −0.14]**	**<.001**	**−0.14**	**[−0.16, −0.11]**	**<.001**
Health				**0.03**	**[0.02, 0.03]**	**<.001**	**0.04**	**[0.03, 0.05]**	**<.001**
Age × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Age^2 × Income							**0.00**	**[0.00, 0.00]**	**<.001**
Female × Income							**0.00**	**[0.00, 0.00]**	**.003**
In Relationship × Income							**−0.01**	**[−0.01, −0.00]**	**<.001**
Employed × Income							**−0.00**	**[−0.00, 0.00]**	**.064**
Child × Income							−0.00	[−0.00, 0.00]	.243
Health × Income							**−0.00**	**[−0.00, −0.00]**	**.002**
Constant	**4.02**	**[3.96, 4.09]**	**<.001**	**3.78**	**[3.66, 3.90]**	**<.001**	**3.01**	**[2.85, 3.17]**	**<.001**
Obs		38,618			38,371			38,371	
N		25,540			25,383			25,383	

Predictor	(M10) Aggregate saving Unadjusted baseline			(M11) Aggregate saving Additive control			(M12) Aggregate saving Full control		
	b	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.14**	**[0.09, 0.18]**	**<.001**	**0.23**	**[0.19, 0.28]**	**<.001**	**0.22**	**[0.18, 0.27]**	**<.001**
Income	**0.04**	**[0.03, 0.04]**	**<.001**	**0.04**	**[0.04, 0.05]**	**<.001**	**0.10**	**[0.09, 0.11]**	**<.001**
Optimism × Income	**−0.00**	**[−0.00, −0.00]**	**.006**	**−0.00**	**[−0.01, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**<.001**
Age				**0.07**	**[0.06, 0.08]**	**<.001**	**0.10**	**[0.09, 0.11]**	**<.001**
Age^2				**−0.00**	**[−0.00, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**<.001**
Female				0.00	[−0.06, 0.06]	.899	0.02	[−0.07, 0.10]	.716
Married				**0.43**	**[0.37, 0.49]**	**<.001**	**0.58**	**[0.48, 0.67]**	**<.001**
Employed				**−0.09**	**[−0.15, −0.02]**	**.012**	**−0.09**	**[−0.19, −0.00]**	**.045**
Number children				**−0.44**	**[−0.47, −0.41]**	**<.001**	**−0.51**	**[−0.56, −0.46]**	**<.001**
Health				**0.13**	**[0.11, 0.14]**	**<.001**	**0.15**	**[0.12, 0.17]**	**<.001**
Age × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Age^2 × Income							**0.00**	**[0.00, 0.00]**	**<.001**
Female × Income							−0.00	[−0.00, 0.00]	.717
In Relationship × Income							**−0.01**	**[−0.01, −0.00]**	**<.001**
Employed × Income							−0.00	[−0.00, 0.00]	.582
Child × Income							**0.00**	**[0.00, 0.00]**	**<.001**
Health × Income							**−0.00**	**[−0.00, −0.00]**	**.027**
Constant	**6.73**	**[6.58, 6.89]**	**<.001**	**3.07**	**[2.80, 3.34]**	**<.001**	**2.27**	**[1.93, 2.62]**	**<.001**
Obs		37,588			37,315			37,315	
N		29,438			29,241			29,241	

Note. This table presents results from multilevel mixed-effects models predicting four savings measures from optimism, income, their interaction, and covariates in Study 7. Bolded values indicate statistical significance at $p < .05$. Obs = total number of observations across all waves; *N* = number of unique participants; M = model; CI = confidence interval.

Study 8: Longitudinal Within-Person Evidence From Socioeconomic Panel

Method

Data Set and Participants

The socioeconomic panel (SOEP) is a long-running annual household panel study conducted in Germany. Its primary focus is examining various aspects of the life course and well-being. The data used in this study were collected over a period of 18 years, from 1998 to 2016. The data set and its characteristics have been described in detail in the previous research (Wagner et al., 2007). The timing of the measures used in this study is provided in Table 29. The data are collected through both in-person interviews and self-completion questionnaires. The study maintains high response rates and is well-regarded for its representativeness of the German population (Wagner et al., 2007).

Measures

Optimism. Optimism was assessed using a single item asking about respondents' attitudes toward the future (1 = optimistic, 2 = more optimistic than pessimistic, 3 = more pessimistic than optimistic, 4 = pessimistic). We reverse-scored the item such that higher numbers represented higher levels of optimism. The mean level of optimism ranged from 2.77 (*SD* = 0.81) to 3.11 (*SD* = 0.75; see Table 29). As optimism was measured using a single item, we could not test differences between optimism and pessimism in this study.

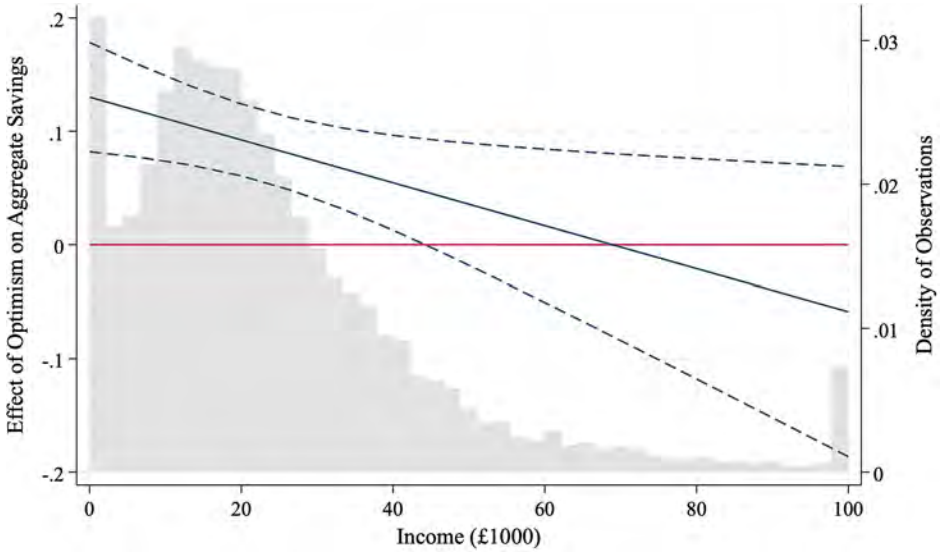
Income. Participants' annual income was measured using their personal salary. Across the 19 waves of data collection, the mean annual income ranged from €11,720 (*SD* = €14,610) in 1998 to €16,530 (*SD* = €23,400) in 2016 (Table 29).

Investment Returns (Savings Proxy). We used investment returns as a proxy for savings due to the absence of a comprehensive savings measure in the SOEP data set. This measure incorporates

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 10

Interaction Between Income and Optimism Predicting Aggregate Savings (Study 7)



Note. Dashed lines represent 95% confidence interval. Income is winsorized at the 1st and 99th percentiles for visualization purposes only; the full range of income data was used in the statistical analysis. The steeper slope for lower incomes illustrates the stronger effect of optimism on savings for individuals with lower income levels. See the online article for the color version of this figure.

income from interest, dividends, and rental income, reflecting both wealth accumulation and financial management. Mean investment returns grew from €1,141.08 (SD = €4,974.14) in 1998 to €3,054.72 (SD = €28,655.18) in 2008. We log-transformed these values to address skewed distributions.

While this proxy offers insights into participants' saving and investment strategies, it has limitations. It may underestimate savings in nonyielding assets like cash or appreciation-only assets such as owner-occupied real estate.

Table 29 presents a timeline of income, optimism, and investment returns across the study period. Income and investment returns were measured consistently, while optimism was assessed in four specific waves (1999, 2005, 2009, and 2014).

Transparency and Openness

The sample size for this study was determined based on the available data, with all exclusions clearly reported. The SOEP data set, managed by the German Institute for Economic Research (DIW Berlin), is accessible to researchers globally. To obtain the data, researchers must register on the SOEP website (https://www.diw.de/en/soep) and complete a data use agreement detailing their research objectives. The data set can be accessed under the digital object identifier at https://doi.org/10.5684/soep.core.v36eu. Our analysis code is publicly available on the OSF at https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6. This study was not preregistered.

Analytic Strategy

Our analysis of the German SOEP data employed a fixed-effects approach similar to Study 7, with key adaptations to leverage the unique aspects of this data set and rigorously test our hypotheses. Fixed-effects models are particularly valuable for longitudinal data as they control for all time-invariant individual characteristics, whether observed or unobserved. This approach allows us to isolate within-person changes in optimism and their relationship to changes in investment returns, effectively controlling for stable individual differences that might confound between-person comparisons.

Given the observed mean-level change in optimism over time in this sample (see the Stability and Change in Dispositional Optimism section below), we implemented a double fixed-effects approach for our basic model, controlling for both individual and year effects. This method addresses concerns about temporal trends that might affect both optimism and investment returns. The basic model can be represented by the following equation:

$$\text{Investment Returns}_{it} = \beta_1 \text{Optimism}_{it} + \beta_2 Z_{it} + \alpha_i + \gamma_t + \varepsilon_{it}. \quad (3)$$

This equation extends the model used in Study 7 by incorporating γ_t, which represents year fixed effects. The inclusion of both α_i (individual fixed effects) and γ_t allows us to control for time-invariant individual characteristics and time-specific factors affecting all individuals. This double fixed-effects approach provides a more robust analysis by accounting for potential confounds at both the individual and temporal levels, thereby isolating the within-person effects of changes in optimism on investment returns over time. A significant, positive β_1 would provide support for Hypothesis 1b.

For models including the interaction between optimism and income, we used only person fixed effects:

$$\text{Savings}_{it} = \beta_1 \text{Optimism}_{it} + \beta_2 \text{Income}_{it} + \beta_3 \text{Optimism}_{it} \times \text{Income}_{it} + \alpha_i + \varepsilon_{it}. \quad (4)$$

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 28

Results of Fixed-Effects Models Predicting Within-Person Changes in Savings From Optimism, Income, Their Interaction, and Interacted Covariates (Study 7)

	(M1) Has saving Unadjusted baseline			(M2) Has saving Unadjusted baseline			(M3) Has saving Additive control			(M4) Has saving Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.01**	**[0.00, 0.01]**	**.002**	**0.01**	**[0.01, 0.02]**	**<.001**	**0.01**	**[0.00, 0.02]**	**.002**	**0.01**	**[0.00, 0.02]**	**.005**
Income	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.01]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**	**0.01**	**[0.00, 0.01]**	**<.001**
Optimism × Income				**−0.00**	**[−0.00, −0.00]**	**.041**	−0.00	[−0.00, 0.00]	.091	−0.00	[−0.00, 0.00]	.157
Married							**0.02**	**[0.00, 0.03]**	**.037**	**0.06**	**[0.03, 0.08]**	**<.001**
Employed							**0.11**	**[0.10, 0.12]**	**<.001**	**0.10**	**[0.09, 0.12]**	**<.001**
Number Children							**−0.02**	**[−0.02, −0.01]**	**<.001**	**−0.01**	**[−0.02, −0.00]**	**.024**
Health							**0.00**	**[0.00, 0.01]**	**.009**	**0.01**	**[0.00, 0.01]**	**.013**
In Relationship × Income										**−0.00**	**[−0.00, −0.00]**	**<.001**
Employed × Income										0.00	[−0.00, 0.00]	.509
Child × Income										−0.00	[−0.00, 0.00]	.353
Health × Income										−0.00	[−0.00, 0.00]	.326
Constant	**0.40**	**[0.38, 0.41]**	**<.001**	**0.38**	**[0.35, 0.40]**	**<.001**	**0.33**	**[0.30, 0.36]**	**<.001**	**0.30**	**[0.27, 0.34]**	**<.001**
Obs		97,424			97,424			96,714			96,714	
N		51,325			51,325			51,024			51,024	

	(M5) Frequent saver Unadjusted baseline			(M6) Frequent saver Unadjusted baseline			(M7) Frequent saver Additive control			(M8) Frequent saver Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.01**	**[0.00, 0.02]**	**.005**	**0.03**	**[0.01, 0.04]**	**<.001**	**0.03**	**[0.01, 0.04]**	**<.001**	**0.02**	**[0.01, 0.04]**	**<.001**
Income	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.01]**	**<.001**
Optimism × Income				**−0.00**	**[−0.00, −0.00]**	**.002**	**−0.00**	**[−0.00, −0.00]**	**.004**	**−0.00**	**[−0.00, −0.00]**	**.018**
Married							−0.02	[−0.05, 0.01]	.161	0.02	[−0.02, 0.05	.387
Employed							**0.07**	**[0.05, 0.09]**	**<.001**	**0.09**	**[0.06, 0.11]**	**<.001**
Number children							−0.01	[−0.03, 0.00]	.082	−0.01	[−0.03, 0.01]	.198
Health							0.00	[−0.00, 0.01]	.283	0.01	[−0.00, 0.01]	.140
In Relationship × Income										**−0.00**	**[−0.00, −0.00]**	**.007**
Employed × Income										−0.00	[−0.00, 0.00]	.060
Child × Income										0.00	[−0.00, 0.00]	.865
Health × Income										−0.00	[−0.00, 0.00]	.285
Constant	**0.64**	**[0.61, 0.67]**	**<.001**	**0.58**	**[0.54, 0.63]**	**<.001**	**0.56**	**[0.51, 0.62]**	**<.001**	**0.52**	**[0.46, 0.58]**	**<.001**
Obs		43,776			43,776			43,491			43,491	
N		28,065			28,065			27,895			27,895	

	(M9) Recurring saving Unadjusted baseline			(M10) Recurring saving Unadjusted baseline			(M11) Recurring saving Additive control			(M12) Recurring saving Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.03**	**[0.01, 0.05]**	**.005**	0.03	[−0.01, 0.06]	.137	0.02	[−0.01, 0.06]	.209	0.01	[−0.02, 0.05]	.422
Income	**0.02**	**[0.01, 0.02]**	**<.001**	**0.02**	**[0.01, 0.02]**	**<.001**	**0.01**	**[0.01, 0.02]**	**<.001**	**0.02**	**[0.02, 0.03]**	**<.001**
Optimism × Income				0.00	[−0.00, 0.00]	.683	0.00	[−0.00, 0.00]	.842	0.00	[−0.00, 0.00]	.406
Married							**0.07**	**[−0.00, 0.13]**	**.052**	**0.33**	**[0.23, 0.42]**	**<.001**
Employed							**0.19**	**[0.14, 0.24]**	**<.001**	**0.21**	**[0.14, 0.28]**	**<.001**
Number children							**−0.15**	**[−0.18, −0.11]**	**<.001**	**−0.11**	**[−0.16, −0.06]**	**<.001**
Health							**0.01**	**[0.00, 0.02]**	**.048**	**0.03**	**[0.01, 0.05]**	**.002**
In Relationship × Income										**−0.01**	**[−0.01, −0.01]**	**<.001**
Employed × Income										−0.00	[−0.00, 0.00]	.097
Child × Income										**−0.00**	**[−0.00, −0.00]**	**.032**
Health × Income										**−0.00**	**[−0.00, −0.00]**	**.012**
Constant	**4.45**	**[4.37, 4.53]**	**<.001**	**4.47**	**[4.35, 4.59]**	**<.001**	**4.39**	**[4.25, 4.53]**	**<.001**	**4.12**	**[3.97, 4.28]**	**<.001**
Obs		38,618			38,618			38,377			38,377	
N		25,540			25,540			25,388			25,388	

Note. This table presents results from fixed-effects models predicting within-person changes in savings from optimism, income, their interaction, and covariates in Study 7. Bolded values indicate statistical significance at $p < .05$. Fixed-effects models control for all time-invariant individual characteristics, whether observed or unobserved. Thus, coefficients represent the effect of within-person changes in the predictor on within-person changes in the outcome. Obs = total number of observations across all waves; *N* = number of unique participants; M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 29
Descriptive Statistics for Income, Optimism, and Investment Returns by Year (Study 8)

	Investment return			Optimism			Income		
Year	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
1998	19,371	1141.08	4974.14				14,670	11.72	14.61
1999	18,578	1253.89	5250.86	13,989	3.01	0.80	14,085	12.02	14.87
2000	32,453	1559.20	7814.95				24,576	12.33	16.21
2001	29,313	1481.05	6360.11				22,351	12.37	16.33
2002	31,232	2677.07	17465.75				23,892	14.38	20.60
2003	29,389	2487.46	17865.06				22,611	14.32	20.32
2004	28,469	2760.37	37506.81				22,019	14.17	20.33
2005	27,247	2691.09	41511.79	20,981	2.83	0.81	21,105	14.11	20.49
2006	29,193	2625.53	21116.64				22,665	13.76	20.53
2007	27,125	2608.70	15863.94				21,232	13.93	20.48
2008	25,366	3054.72	28655.18				19,945	14.17	20.54
2009	27,107	2354.76	12486.25	20,699	2.77	0.81	21,035	14.49	21.11
2010	41,483	1716.77	8397.75				27,124	14.74	21.18
2011	44,507	1719.98	10123.9				29,264	14.75	22.09
2012	42,906	1705.00	10620.4				28,520	15.27	22.49
2013	48,115	1693.83	14334.67				31,523	15.48	22.46
2014	42,123	1699.43	13369.19	27,275	3.11	0.75	28,042	15.76	22.40
2015	41,642	1439.80	8267.16				27,743	16.02	22.18
2016	37,356	1759.22	11186.93				25,186	16.53	23.40

Note. This table presents descriptive statistics for key variables in Study 8 across 19 years of the German Socioeconomic Panel (SOEP) study, from 1998 to 2016. Investment returns are expressed in Euros (€) and represent income from interest, dividends, and rental properties. This measure serves as a proxy for savings in the absence of direct savings measures. Income is reported in thousands of Euros (€) and represents annual personal income. Sample sizes (*N*) vary across variables and years due to missing data, attrition, and differences in measurement frequency. The general increase in sample size over time reflects the addition of new participants to the SOEP study. *N* = number of participants.

This choice allows for a clearer interpretation of how the optimism–investment returns relationship varies with income over time, while still controlling for time-invariant individual characteristics. A significant negative β_3 would support Hypothesis 2, indicating that the positive effect of optimism on savings diminishes as income increases, even when controlling for stable individual differences. This interpretation differs from cross-sectional analyses in the previous studies, which examined between-person differences rather than within-person changes.

A unique feature of the SOEP data set is the inclusion of Big Five personality trait measures for a subset of participants. To leverage this additional data while maximizing statistical power, we conducted separate analyses controlling for these traits. This allowed us to examine whether the relationship between optimism and investment returns persists when accounting for broader personality characteristics.

By applying this analytical approach to the SOEP data, we were able to extend and validate the findings from Study 7 in a different national context, with a longer time horizon, and using a distinct proxy measure for savings behavior. This approach enables us to make stronger inferences about the dynamic relationship between optimism and financial outcomes over time, while rigorously testing our hypotheses.

Results

Multilevel Analysis of Optimism's Contemporaneous Effects on Savings

The results of the multilevel regression model revealed that optimism had a positive and significant effect on investment returns ($b = 0.04$, $t = 4.18$, 95% CI [0.02, 0.07], $p < .001$). In a model including controls (Table 30, Model 2), the effect of optimism remained significant ($b = 0.04$, $t = 3.04$, 95% CI [0.01, 0.06], $p = .002$). These findings support the hypothesis that optimism is positively associated with savings (Hypothesis 1b).

Stability and Change in Dispositional Optimism

The present study's stability results share similarities with Study 7 but also present notable differences. Similar to Study 7, the rank-order stability coefficient of .4314 indicates that 43.14% of the variance in optimism scores can be attributed to stable individual differences. The consistency in rank-order stability across the two studies strengthens the evidence for the temporal stability of dispositional optimism.

However, the present study found a small but statistically significant fixed-effects coefficient for the linear term of time ($b = .009$, $z = 17.76$, $p < .001$), indicating that, on average, optimism levels changed across the waves. This finding differs from Study 7, which found a small and nonsignificant fixed-effects coefficient for the linear term of time ($b = .005$, $p = .398$). This difference might be related to the specific context of Germany between 1999 and 2014. While speculative, it is possible that this period of growth and integration following reunification could have contributed to the observed mean-level change in optimism.

The observed mean-level change justifies the use of a double fixed-effects approach in the main analysis, including fixed effects for both person and year. This method offers advantages over the single fixed-effects model used in Study 7 by accounting for systematic changes in optimism levels over time and providing more robust control for potential time-varying confounders. By controlling for both individual differences and temporal changes, this approach enhances the reliability of our findings on the relationship

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 30

Results of Multilevel Regression Models Predicting Investment Returns From Optimism, Income, Their Interaction, and Covariates (Study 8)

	(M1) Unadjusted baseline			(M2) Additive control			(M3) Unadjusted baseline			(M4) Additive control			(M5) Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**.04**	**[.02, .07]**	**<.001**	**.04**	**[.01, .06]**	**.002**	**.04**	**[0.02, 0.07]**	**.001**	**0.05**	**[0.03, 0.08]**	**<.001**	**0.04**	**[0.01, 0.07]**	**.004**
Income							**.02**	**[0.01, 0.02]**	**<.001**	**0.02**	**[0.02, 0.02]**	**<.001**	**−0.03**	**[−0.04, −0.01]**	**.001**
Optimism × Income							**−.00**	**[−0.00, −0.00]**	**.025**	**−0.00**	**[−0.00, −0.00]**	**.001**	−0.00	[−0.00, 0.00]	.137
Age				**−.09**	**[−.14, −.04]**	**<.001**				0.02	[−0.02, 0.07]	.346	0.02	[−0.04, 0.07]	.584
Age^2				**−.02**	**[−.02, −.01]**	**<.001**				**−0.04**	**[−0.04, −0.03]**	**<.001**	**−0.05**	**[−0.06, −0.04]**	**<.001**
Female				**.00**	**[.00, .00]**	**<.001**				**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**
In relationship				**.74**	**[.70, .79]**	**<.001**				**0.74**	**[0.70, 0.79]**	**<.001**	**0.90**	**[0.84, 0.96]**	**<.001**
Employed				**.37**	**[.32, .41]**	**<.001**				**0.14**	**[0.09, 0.18]**	**<.001**	**0.15**	**[0.10, 0.20]**	**<.001**
Child				**−.18**	**[−.20, −.16]**	**<.001**				**−0.18**	**[−0.20, −0.16]**	**<.001**	**−0.24**	**[−0.27, −0.22]**	**<.001**
Health				**.08**	**[.07, .09]**	**<.001**				**0.08**	**[0.07, 0.09]**	**<.001**	**0.10**	**[0.09, 0.11]**	**<.001**
Age × Income													0.00	[−0.00, 0.00]	.304
Age^2 × Income													**0.00**	**[0.00, 0.00]**	**<.001**
Female × Income													**−0.00**	**[−0.00, −0.00]**	**<.001**
In Relationship × Income													**−0.01**	**[−0.01, −0.01]**	**<.001**
Employed × Income													−0.00	[−0.00, 0.00]	.829
Child × Income													**0.00**	**[0.00, 0.00]**	**<.001**
Health × Income													**−0.00**	**[−0.00, −0.00]**	**<.001**
Constant	**4.57**	**[4.50, 4.63]**	**<.001**	**3.67**	**[3.48, 3.86]**	**<.001**	**4.36**	**[4.28, 4.44]**	**<.001**	**3.83**	**[3.64, 4.03]**	**<.001**	**4.14**	**[3.93, 4.36]**	**<.001**
Obs		82,944			82,803			82,944			82,803			82,803	
N		46,813			46,774			46,813			46,774			46,774	

Note. This table presents results from multilevel regression models predicting investment returns from optimism, income, their interaction, and covariates in Study 8. Bolded values indicate statistical significance at $p < .05$. Obs = total number of observations across all years; *N* = number of unique participants; M = model; CI = confidence interval.

between optimism and savings in the German context. It allows us to better isolate the within-person effect of optimism on savings while controlling for unobserved factors that may vary across both individuals and time.

Within-Person Analyses of Optimism on Savings

The results (Table 31, Model 1) demonstrated that optimism significantly predicted higher investment returns ($b = 0.04$, $t = 3.02$, 95% CI [0.02, 0.07], $p = .003$). This effect remained significant after controlling for time-varying covariates (Table 31, Model 2; $b = 0.04$, $t = 3.00$, 95% CI [0.02, 0.07], $p = .003$). These findings suggest that within-person changes in optimism are associated with corresponding changes in savings. The inclusion of time-varying covariates in Model 2 strengthens the robustness of the findings. Controlling for relationship status, employment status, number of children, and health helps to account for important life events and circumstances that may associate with both optimism and savings.

Multilevel Analysis of the Moderating Role of Income

To test the hypothesis that income moderates the relationship between optimism and savings (Hypothesis 2), we included an interaction term between optimism and income in the multilevel models (Table 30). The interaction was significant ($b = -0.001$, $z = -2.25$, 95% CI [−0.002, −0.0002], $p = .025$), indicating that the effect of optimism on savings varied across income levels. To better understand the nature of this interaction, we examined the effect of optimism on savings at different levels of income. At low-income levels (10th percentile), the effect of optimism on savings was positive and significant ($b = .045$, $z = 3.44$, 95% CI [0.019, 0.07], $p = .001$). This suggests that for individuals with lower incomes, higher levels of optimism were associated with increased savings. In contrast, at high-income levels (90th percentile), the effect of optimism on savings was not significant ($b = -0.001$, $t = -0.07$, 95% CI [−0.035, 0.032], $p = .946$). These findings indicate that the relationship between optimism and savings is more pronounced for individuals with lower incomes, supporting the moderation hypothesis (Hypothesis 2).

Figure 11 visually depicts this interaction effect, showing that the slope of the relationship between optimism and investment returns is steeper for individuals with lower incomes compared to those with higher incomes. After including covariates (Table 30, Model 4), the interaction between optimism and income remained significant ($b = -0.002$, $z = -3.23$, 95% CI [−0.002, −0.001], $p = .001$).

However, when we further expanded our model to include all controls and their interactions with income (Table 30, Model 5), the interaction between optimism and income was no longer significant ($b = -0.001$, $z = -1.45$, 95% CI [−.002, .0003], $p = .137$). This indicates that the moderation effect is sensitive to model specification and the inclusion of a large number of covariates and their interactions.

Controlling for Changes in the Big Five Traits

As only a subsample of participants were given the items for the Big Five personality traits (Table 32), we controlled for these separately to maximize statistical power across analyses. Optimism remained a significant predictor of investment returns ($b = 0.14$, $z = 8.66$, 95% CI [0.11, 0.17], $p < .001$) after controlling for these traits (Table 32, Model 1). The interaction between optimism and income also remained significant (Model 3; $b = -0.003$, $z = -4.10$, 95% CI [−0.005, −0.002], $p = .029$), suggesting that the moderation effect was robust to the inclusion of these personality traits.

Within-Person Analyses: Income as a Moderator of the Optimism–Savings Link

We employed fixed-effects models to examine how changes in optimism and income within individuals relate to changes in their savings behavior over time. Table 33 presents the results of these models. In Model 2, which included basic controls, we observed a significant interaction between optimism and income ($b = -0.002$, $t = -2.76$, 95% CI [−0.003, −0.001], $p = .006$). This interaction

Table 31

Results of Fixed-Effects Models Predicting Within-Person Changes in Investment Returns From Optimism and Covariates (Study 8)

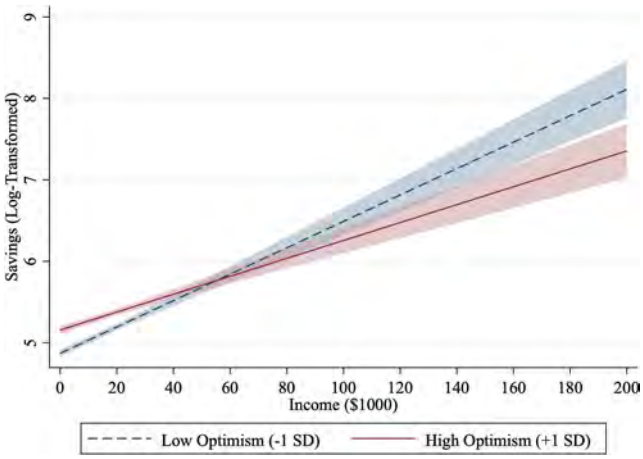
	(M1) Unadjusted baseline			(M2) Additive control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**.04**	**[.02, .07]**	**.003**	**.04**	**[.02, .07]**	**.003**
In relationship				**.35**	**[.28, .43]**	**<.001**
Employed				**.07**	**[.01, .12]**	**.017**
Child				.03	[−.00, .06]	.088
Health				.01	[−.00, .02]	.226
Constant	**5.04**	**[4.95, 5.12]**	**<.001**	**4.72**	**[4.59, 4.84]**	**<.001**
Obs		82,944			82,803	
N		46,813			46,774	

Note. This table presents results from fixed-effects models predicting within-person changes in investment returns from optimism and covariates in Study 8. The dependent variable, investment returns, is log-transformed. Bolded values indicate statistical significance at $p < .05$. These fixed-effects models include controls for both person and survey year, effectively controlling for all time-invariant individual characteristics and any year-specific effects. Coefficients represent the effect of within-person changes in the predictor on within-person changes in investment returns. Obs = total number of observations across all years; *N* = number of unique participants; M = model; CI = confidence interval.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Figure 11

Interaction Between Income and Optimism Predicting Asset Flows (Study 8)



Note. Shaded regions indicate 95% confidence bands. See the online article for the color version of this figure.

persisted in Model 3 ($b = -0.002$, $t = -2.48$, 95% CI [−0.003, −0.0004], $p = .013$), which incorporated additional covariates. However, in Model 4, with the full set of interaction terms, the significance of this interaction diminished ($b = -0.001$, $t = -1.59$, 95% CI [−0.003, 0.0003], $p = .112$).

These findings suggest that as an individual's income increases, the positive effect of their optimism on savings tends to decrease. Conversely, during periods of lower income, the same individual might experience a stronger positive relationship between optimism and savings behavior. This pattern aligns with our moderation hypothesis (Hypothesis 2), though the attenuation of the interaction effect in Model 4 raises questions about its robustness.

Longitudinal Evidence Discussion (Studies 4–8)

Our longitudinal analyses, encompassing five diverse data sets across multiple countries, provide robust evidence for the relationship between dispositional optimism, income, and saving behavior. These studies offer stronger causal inferences than cross-sectional designs, allowing us to examine both between-person differences and within-person changes over time.

Main Findings: Optimism and Savings (Hypothesis 1b)

Across all five longitudinal studies, comprising 13 distinct savings outcomes, we find consistent support for Hypothesis 1b: dispositional optimism positively predicts savings. This relationship holds in models both without controls and with additive controls, demonstrating its robustness across diverse cultural contexts, measurement approaches, and analytical techniques. Table 34 provides a summary of these findings.

Studies 7 and 8 provide particularly compelling evidence through within-person analyses. By examining how changes in an individual's optimism correspond to changes in their saving behavior over time, we control for stable individual differences that might confound between-person comparisons (Allison, 2009). The significant within-person effects observed in these studies offer strong support for the dynamic nature of the optimism–savings relationship. While fixed-effects models offer robust advantages in controlling for unobserved heterogeneity, they come with notable limitations. These models cannot estimate the effects of time-invariant predictors, potentially restricting our ability to examine certain stable individual characteristics (Wooldridge, 2010). Moreover, there remains a risk of bias stemming from time-varying confounders not accounted for in the model, which could influence the reliability of our estimates. Future research could benefit from employing alternative econometric techniques, such as dynamic panel models or instrumental variable approaches, to further validate and extend our findings (Arellano & Bond, 1991; Bun & Sarafidis, 2015).

Study 7's multiple measures of savings (amount, frequency, and regularity) demonstrate that optimism's influence extends beyond mere accumulation to shape broader saving habits. Study 8's use of investment returns as a proxy for accumulated savings provides insights into how optimism affects long-term financial decision making and wealth accumulation.

Interaction Between Optimism and Income (Hypothesis 2)

Our longitudinal designs also allow us to explore how the interaction between optimism and income evolves over time (Hypothesis 2). While the evidence for this hypothesis was more mixed, it remains supportive when assessed in aggregate. In models without controls, all 13 savings measures across the five studies support Hypothesis 2. With additive controls, 11 out of 13 measures maintain support, with two showing mixed results. This pattern suggests that the moderating effect of income on the optimism–savings relationship is robust, albeit sensitive to covariate inclusion.

However, models with interactive controls, where each covariate is interacted with income, yield more varied results. In these complex models, seven measures show consistent support, four show mixed results, and one lacks support. This variability raises important questions about the specific conditions under which income moderates the optimism–savings relationship. It suggests that the interaction may be contingent on other factors, potentially including demographic characteristics, economic conditions, or cultural contexts.

The inconsistency in results across model specifications highlights the complex nature of the optimism–income–savings relationship. It underscores the need for careful consideration of model selection and interpretation in future research. Moreover, it suggests that the moderating role of income may be more nuanced than initially hypothesized, potentially varying across different subpopulations or contexts.

In conclusion, our longitudinal studies provide strong evidence for the positive relationship between dispositional optimism and savings behavior, while offering qualified support for the moderating role of income. The consistency of the main effect across diverse measures, contexts, and analytical approaches bolsters its validity and generalizability. However, the variability in the interaction effect emphasizes the need for further research to elucidate the specific circumstances under which income modifies the optimism–savings relationship.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 32

Results of Multilevel Regression Models Predicting Investment Returns From Optimism, Income, Their Interaction, and Covariates Including the Big Five Traits (Study 8)

	(M1) Additive control			(M2) Additive control			(M3) Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	**0.14**	**[0.11, 0.17]**	**<.001**	**0.17**	**[0.13, 0.21]**	**<.001**	**0.15**	**[0.11, 0.19]**	**<.001**
Income				**0.02**	**[0.02, 0.03]**	**<.001**	0.02	[−0.01, 0.04]	.237
Optimism × Income				**−0.00**	**[−0.00, −0.00]**	**<.001**	**−0.00**	**[−0.00, −0.00]**	**.029**
Age	−0.05	[−0.11, 0.01]	.119	0.05	[−0.01, 0.12]	.083	0.03	[−0.05, 0.10]	.457
Age^2	**−0.01**	**[−0.02, −0.00]**	**.010**	**−0.03**	**[−0.04, −0.02]**	**<.001**	**−0.05**	**[−0.06, −0.04]**	**<.001**
Female	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**	**0.00**	**[0.00, 0.00]**	**<.001**
In relationship	**0.79**	**[0.72, 0.86]**	**<.001**	**0.79**	**[0.72, 0.85]**	**<.001**	**0.95**	**[0.87, 1.03]**	**<.001**
Employed	**0.41**	**[0.35, 0.48]**	**<.001**	**0.19**	**[0.13, 0.26]**	**<.001**	**0.15**	**[0.08, 0.22]**	**<.001**
Child	**−0.10**	**[−0.13, −0.07]**	**<.001**	**−0.10**	**[−0.14, −0.07]**	**<.001**	**−0.14**	**[−0.18, −0.10]**	**<.001**
Health	**0.08**	**[0.07, 0.10]**	**<.001**	**0.08**	**[0.07, 0.09]**	**<.001**	**0.09**	**[0.08, 0.11]**	**<.001**
Extraversion	**0.14**	**[0.12, 0.16]**	**<.001**	**0.14**	**[0.11, 0.16]**	**<.001**	**0.18**	**[0.15, 0.21]**	**<.001**
Agreeableness	0.03	[−0.01, 0.07]	.122	0.02	[−0.02, 0.06]	.276	0.04	[−0.00, 0.08]	.072
Conscientiousness	**−0.08**	**[−0.11, −0.04]**	**<.001**	**−0.07**	**[−0.10, −0.04]**	**<.001**	**−0.07**	**[−0.11, −0.03]**	**<.001**
Neuroticism	−0.03	[−0.06, 0.00]	.067	−0.03	[−0.06, 0.00]	.072	−0.02	[−0.06, 0.02]	.274
Openness	**−0.11**	**[−0.14, −0.08]**	**<.001**	**−0.10**	**[−0.13, −0.07]**	**<.001**	**−0.11**	**[−0.14, −0.08]**	**<.001**
Age × Income							**0.00**	**[0.00, 0.01]**	**.030**
Age^2 × Income							**0.00**	**[0.00, 0.00]**	**.014**
Female × Income							−0.00	[−0.00, 0.00]	.084
In Relationship × Income							**−0.01**	**[−0.02, −0.01]**	**<.001**
Employed × Income							0.00	[−0.00, 0.01]	.161
Child × Income							**0.00**	**[0.00, 0.00]**	**<.001**
Health × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Extraversion × Income							**−0.00**	**[−0.00, −0.00]**	**<.001**
Agreeableness × Income							**−0.00**	**[−0.00, −0.00]**	**.023**
Conscientiousness × Income							0.00	[−0.00, 0.00]	.755
Neuroticism × Income							−0.00	[−0.00, 0.00]	.678
Openness × Income							0.00	[−0.00, 0.00]	.201
Constant	**3.68**	**[3.34, 4.03]**	**<.001**	**3.76**	**[3.42, 4.11]**	**<.001**	**3.84**	**[3.44, 4.24]**	**<.001**
Obs		41,451			41,451			41,451	
N		26,656			26,656			26,656	

Note. This table presents results from multilevel regression models predicting investment returns from optimism, income, their interaction, and covariates including the Big Five personality traits in Study 8. The dependent variable, investment returns, is log-transformed. Bolded values indicate statistical significance at $p < .05$. Obs = total number of observations across all years; *N* = number of unique participants; M = model; CI = confidence interval.

General Discussion

The present research sought to investigate the role of dispositional optimism in driving individual saving behavior and to examine how this relationship varies as a function of financial circumstances. Drawing upon a diverse array of data sets and analytical approaches, we conducted eight studies to test our central hypotheses: that dispositional optimism would be associated with increased savings, and that this association would be stronger among individuals with lower incomes. A key strength of the research lies in the size and diversity of our samples, the use of both cross-sectional and longitudinal designs, and the variety of measures and models used. Our findings contribute to the growing body of literature highlighting the importance of psychological factors in shaping economic outcomes (e.g., Agarwal et al., 2009; Guiso et al., 2013; Puri & Robinson, 2007).

Positive Association Between Optimism and Savings

Our findings consistently demonstrate a positive association between dispositional optimism and savings, supporting Hypothesis 1b. This relationship persists across diverse samples and methodologies, even after controlling for various demographic, socioeconomic, and personality factors.

To assess the practical significance of our findings, we calculated an average standardized effect size (β) of 0.169 for the concurrent association between optimism and savings, focusing on Studies 1–5 due to their straightforward cross-sectional design.[1] Translating this effect into monetary terms using data from the Federal Reserve's 2022 Survey of Consumer Finances reveals its substantial impact: a 1 *SD* increase in optimism correlates with a $1,352 increase in savings for households with the median savings balance of $8,000, and a $10,547 increase for those with the mean balance of $62,410. Both scenarios represent a 16.9% gain in savings.

To contextualize the role of optimism in savings behavior, we compared the effect size of optimism (β = 0.169) to other established predictors. Notably, the effect size of optimism closely aligns with that of conscientiousness (β = 0.17; Fenton-O'Creevy & Furnham, 2023), a trait widely recognized for its positive influence on financial

[1] Effect sizes: Study 1: β = .271; Study 2: β = .145; Study 3: β = .072 (self-reported); Study 4: β = .170 (savings only); Study 5: β = .188. Studies 6–8 were excluded due to their longitudinal design and, for Study 6, multicountry scope, which could introduce additional complexity and variability.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 33

Results of Fixed-Effects Models Predicting Within-Person Changes in Investment Returns From Optimism, Income, Their Interaction, and Covariates (Study 8)

	(M1) Unadjusted baseline			(M2) Unadjusted baseline			(M3) Additive control			(M4) Full control		
Predictor	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*	*b*	95% CI	*p*
Optimism	0.02	[−0.00, 0.05]	.085	**0.05**	**[0.02, 0.08]**	**.003**	**0.04**	**[0.01, 0.07]**	**.020**	0.03	[−0.00, 0.06]	.074
Income	**0.00**	**[0.00, 0.01]**	**<.001**	**0.01**	**[0.00, 0.01]**	**<.001**	**0.01**	**[0.00, 0.01]**	**.001**	**0.02**	**[0.01, 0.02]**	**<.001**
Optimism × Income				**−0.00**	**[−0.00, −0.00]**	**.006**	**−0.00**	**[−0.00, −0.00]**	**.013**	−0.00	[−0.00, 0.00]	.112
Married							**0.28**	**[0.21, 0.36]**	**<.001**	**0.25**	**[0.17, 0.34]**	**<.001**
Employed							**0.08**	**[0.02, 0.14]**	**.008**	**0.09**	**[0.03, 0.16]**	**.005**
Number children							**0.09**	**[0.06, 0.12]**	**<.001**	**0.12**	**[0.08, 0.16]**	**<.001**
Health							**0.03**	**[0.01, 0.04]**	**<.001**	**0.04**	**[0.03, 0.05]**	**<.001**
In Relationship × Income										0.00	[−0.00, 0.00]	.179
Employed × Income										−0.00	[−0.01, 0.00]	.257
Child × Income										**−0.00**	**[−0.00, −0.00]**	**.014**
Health × Income										**−0.00**	**[−0.00, −0.00]**	**<.001**
Constant	**5.04**	**[4.96, 5.13]**	**<.001**	**4.97**	**[4.87, 5.07]**	**<.001**	**4.57**	**[4.45, 4.70]**	**<.001**	**4.51**	**[4.37, 4.65]**	**<.001**
Obs		82,944			82,944			82,803			82,803	
N		46,813			46,813			46,774			46,774	

Note. This table presents results from fixed-effects models predicting within-person changes in investment returns from optimism, income, their interaction, and covariates in Study 8. The dependent variable, investment returns, is log-transformed. Bolded values indicate statistical significance at $p < .05$. The sample size decreases slightly in Models 3 and 4 due to missing data on some covariates. Obs = total number of observations across all years; *N* = number of unique participants; M = model; CI = confidence interval.

outcomes. Furthermore, optimism appears to exert a slightly stronger influence on savings behavior compared to financial literacy ($\beta = 0.14$) and risk tolerance ($\beta = 0.11$; Exley et al., 2021). These comparisons underscore the importance of optimism as a psychological determinant in financial decision making, suggesting it may be as influential as, or even more so than, some well-established cognitive and attitudinal factors.

The consistent relationship between optimism and various measures of saving behavior—from the likelihood of having savings to the amount saved and investment returns—demonstrates optimism's pervasive influence on financial decision making. This consistency suggests that optimism's effects extend beyond mere intentions to actual behavioral outcomes. Our findings align with self-regulation theory (Carver & Scheier, 1982), which posits that optimism enhances goal-directed behavior and persistence. Optimists may view savings goals as more attainable and maintain healthy financial behaviors despite setbacks.

However, it is important to note that the strength of the optimism–savings relationship varied across studies and model specifications, with effect sizes ranging from small to moderate. The relationship occasionally attenuated when controlling for numerous covariates (Study 2) or using objective savings measures (Study 3). This variability highlights the complex nature of the optimism–savings relationship and underscores the need for future research to investigate the specific psychological mechanisms through which optimism influences saving behavior, as well as to identify potential boundary conditions.

In conclusion, our research provides the most comprehensive evidence to date for dispositional optimism's positive role in shaping saving behavior. These findings suggest that fostering optimism could be a promising avenue for interventions aimed at promoting saving and financial well-being. Future research should focus on developing and testing such interventions, while remaining mindful of the complex and potentially bidirectional nature of the optimism–savings relationship.

The Role of Optimism on Savings Across Income Levels

Our research reveals a consistent interaction between optimism and income in predicting savings behavior. The positive association between optimism and savings is consistently stronger among lower income individuals, persisting across various savings measures and control variables. This finding suggests that optimism serves as a crucial psychological resource for maintaining goal-directed behavior and building financial resilience, particularly under economic constraints.

This interaction effect extends previous research on optimism's protective role in adverse contexts to the financial domain. It aligns with studies showing optimists' tendency to employ adaptive coping strategies and maintain positive future expectations when facing challenges (Carver et al., 2010; Nes & Segerstrom, 2006). In the context of financial decision making, optimism may help individuals overcome savings barriers associated with economic disadvantage, potentially counteracting present bias and low self-control tendencies prevalent among low-income populations (Haushofer & Fehr, 2014; Mullainathan & Shafir, 2013).

The variation in the income moderation effect across model specifications points to complex relationships between optimism, income, and savings. Demographic factors like age, gender, and education may directly influence saving behaviors or alter individuals' responsiveness to optimism's effects (Furnham, 1999; Grable, 2000). In addition, financial literacy and resource access likely impact one's ability to translate optimistic outlooks into concrete saving actions (Lusardi & Mitchell, 2014; Sherraden, 1991), particularly for low-income individuals facing additional savings barriers (Bertrand et al., 2006).

These findings underscore the importance of considering socioeconomic contexts when examining psychological determinants of financial decision making. They suggest that fostering optimism could be a promising strategy for improving financial well-being among low-income populations, who often face significant obstacles

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 34
Summary of Results of Hypothesis Tests Across All Studies

Study	DV	Hypothesis 1b		Hypothesis 2		
		(i)	(ii)	(i)	(ii)	(iii)
Study 1: U.K. Charity	Self-reported savings amount	✓	✓	✓	✓	✓
Study 2: Add Health	Self-reported total assets	✓	✓	✓	✓	X
Study 3: Retail Bank	Self-reported savings amount	✓	✓	✓	✓	
	Bank-reported savings amount	X	M	✓	✓	✓
Study 4: Wisconsin Longitudinal Study	Self-reported net assets	✓	✓	✓	✓	✓
	Self-reported savings	✓	✓	✓	✓	✓
Study 5: British Cohort Study	Self-reported savings amount	✓	✓	✓	M	M
Study 6: SHARE Europe	Self-reported net assets	✓	✓	✓	✓	✓
Study 7: Understanding society	Self-reported: Has savings	✓	✓	✓	M	M
	Self-reported: Frequent saver	✓	✓	✓	✓	✓
	Self-reported: Recurring savings	✓	✓	✓	✓	M
	Self-reported: Aggregate savings	✓	✓	✓	✓	✓
Study 8: SOEP	Self-reported investment returns	✓	✓	✓	✓	M

Note. This table summarizes the results of hypothesis tests across all studies. Hypothesis 1b refers to the hypothesis that dispositional optimism is positively associated with savings. Hypothesis 2 refers to the hypothesis that the relationship between optimism and savings is stronger for lower income individuals. (i) = no controls, (ii) = additive controls. (iii) = interactive controls. ✓ indicates support for the hypothesis across all models, M indicates mixed results across models, X indicates a lack of support. DV = dependent variable; SOEP = socioeconomic panel; SHARE = Survey of Health, Ageing and Retirement in Europe.

to saving and long-term financial planning. Future research should explore the specific mechanisms through which optimism influences saving behavior in low-income individuals and develop targeted interventions to promote optimism and financial resilience in this vulnerable population.

Distinct Effects of Optimism and Pessimism on Saving Behavior?

Our investigation into the separate effects of optimism and pessimism subscales on saving behavior yielded inconsistent results across Studies 1, 2, 4, and 5. This variability reflects ongoing debates about the dimensionality of optimism–pessimism (Herzberg et al., 2006; Kubzansky et al., 2004) and provides tentative support for a unidimensional model (Scheier et al., 1994).

Several factors may contribute to these mixed findings. Measurement variations across studies, including differences in item selection and response formats of the LOT-R and its variants, could have influenced results. In addition, optimism and pessimism might affect saving behavior through distinct mechanisms that operate more or less strongly across circumstances. Optimism may promote saving by fostering self-efficacy and confidence in achieving long-term financial goals (Carver & Scheier, 1998), while pessimism might encourage saving by increasing risk aversion and the perceived need for precautionary savings (Felton et al., 2003). The relative strength of these pathways could vary depending on context, such as during financial recessions when the perceived need for precautionary savings might increase universally.

Given these mixed findings, it is critical for future research to move beyond the simple dichotomy of optimism versus pessimism and instead focus on the specific cognitive, affective, and motivational processes underlying how these constructs influence consequential behaviors (Carver et al., 2010). Employing more specific measures, such as separate assessments of positively and negatively framed future expectancies (Lench et al., 2021), could better capture the unique behavioral consequences of optimistic and pessimistic beliefs. This approach aligns with a common perspective from positive psychology, emphasizing the need to examine distinct mechanisms through which positive and negative psychological states influence behavior (Csikszentmihalyi et al., 2014).

Stability and Change in Dispositional Optimism: Implications for Saving Behavior

The longitudinal design of Studies 7 and 8 provides valuable insights into the stability and change of dispositional optimism over time, contributing to the ongoing debate surrounding the nature of personality change (Bleidorn et al., 2022; Roberts et al., 2017). Our findings suggest that optimism possesses both traitlike and statelike properties, exhibiting moderate rank-order stability while also showing potential for mean-level changes.

We observed rank-order stability coefficients of .44 in Study 7 and .43 in study 8, which align with meta-analytic estimates of personality trait stability over similar time intervals (Roberts & DelVecchio, 2000). These moderate coefficients indicate that individuals largely maintain their relative position in optimism levels over time, potentially contributing to the persistent effects of optimism on saving behavior and other financial outcomes (Nes & Segerstrom, 2006).

While slightly lower than the stability coefficients typically observed for the Big Five personality traits (.50–.70 over 6–7 year intervals), our findings are consistent with research on self-esteem, a construct closely related to optimism. Self-esteem studies have reported similar rank-order stability coefficients ranging from .50 to .70 over 1–5 year intervals (Kuster & Orth, 2013; Trzesniewski et al., 2003).

Despite moderate rank-order stability, we also found evidence of mean-level change in optimism. Study 8 revealed a small but statistically significant increase in average optimism levels over time ($b = .009$, $p < .001$). While speculative, the observed increase in optimism in our German sample could reflect the broader socioeconomic changes during the study period, including economic

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

growth and societal shifts following reunification of the country. This finding aligns with research suggesting that personality traits, including optimism, can be influenced by life experiences and contextual factors (Roberts et al., 2006; Segerstrom, 2007).

Future research should focus on identifying specific factors that predict within-person variability in optimism, including major life events, social support, and targeted cognitive behavioral interventions (Atienza et al., 2004; Segerstrom, 2007). Such investigations could inform the development of more effective strategies to enhance optimism and, consequently, improve long-term financial outcomes across diverse populations and life stages.

Generalizability of Findings: Financial Optimism and Cross-Cultural Perspectives

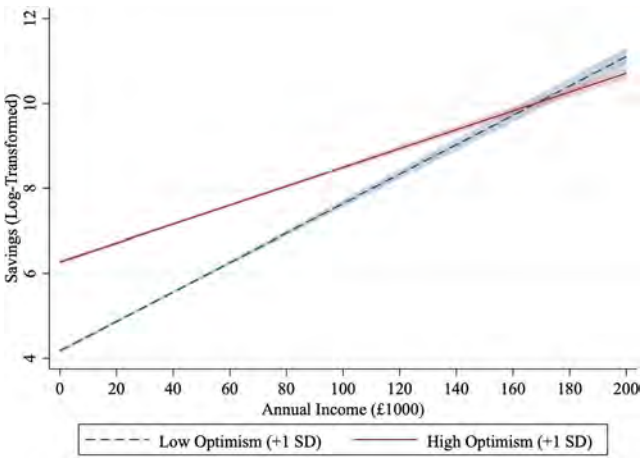
Our research on dispositional optimism's role in savings behavior has revealed consistent patterns across diverse samples. To further test the generalizability of these findings, we extended our investigation in two key directions: examining domain-specific financial optimism and exploring cross-cultural variations.

We conducted a supplementary study using a large U.K. data set ($N = 109,472$) to assess the relationship between financial optimism—specifically, optimism about personal and national economic futures—and savings behavior (detailed in online Supplemental Materials F). The results closely mirrored our findings on dispositional optimism. Higher levels of financial optimism correlated positively with greater savings. Moreover, this relationship was amplified among lower income individuals, mirroring the income moderation effect observed in our main studies.

Figure 12 illustrates this income-moderated effect, showing steeper slopes for lower income groups. This congruence between financial and dispositional optimism suggests that the underlying psychological mechanisms—such as enhanced goal pursuit and self-regulation (Carver & Scheier, 1998)—may operate similarly across different forms of optimism in the financial domain.

Figure 12

Differential Effect of Financial Optimism on Savings Across Income Levels



Note. Graph shows predicted log-transformed savings values for individuals high and low in optimism across levels of income. Shaded areas represent 95% confidence interval. Data from supplementary study detailed in online Supplemental Materials F ($N = 109,472$). See the online article for the color version of this figure.

Beyond generalizing to other forms of optimism, our cross-country analysis in Study 6, encompassing 14 European nations, provides robust evidence for the cross-cultural generalizability of the optimism–savings relationship. Across all countries, we observed positive associations between optimism and savings, though the strength of these associations varied (detailed in online Supplemental Materials E). This universal positive direction aligns with previous research demonstrating similar patterns of association between optimism and various outcomes, such as health and well-being, across diverse cultural contexts (Gallagher et al., 2013; Magaletta & Oliver, 1999).

The observed variations in effect sizes across countries may reflect cultural variations in the conceptualization and linguistic expression of optimism, or differences in institutional and economic factors that shape saving behavior (Fischer & Chalmers, 2008; Joshi & Carter, 2013). For instance, cultures that emphasize individual responsibility for financial well-being may foster stronger optimism–savings associations, as personal outlook might more directly influence financial decisions. Conversely, societies prioritizing collective financial arrangements or offering robust social safety nets might exhibit weaker links between individual optimism and saving behavior, as external factors may play a more significant role in financial outcomes.

Practical Applications

Our findings have significant implications for promoting financial well-being and resilience. Financial education programs and counseling services could benefit from integrating optimism-building techniques, such as cognitive behavioral therapy, mindfulness training, and positive psychology interventions (Meevissen et al., 2011; Peters et al., 2010). These approaches have shown promising results in enhancing optimism and promoting positive outcomes across various domains (Bolier et al., 2013; Eichner et al., 2014).

To implement these techniques, financial education programs can include modules focusing on positive future thinking, goal setting, and self-affirmation. These strategies have been shown to increase optimism and promote positive behavior change (Meevissen et al., 2011; Peters et al., 2010). For instance, a module on positive future thinking could guide participants to envision and articulate their desired financial future, while goal-setting exercises could help them break down their long-term financial aspirations into achievable short-term objectives.

Another promising application is the personalization of savings messages based on individuals' optimism levels, aligning with the concept of psychological fit (Gladstone et al., 2019, 2022; Matz et al., 2016). More optimistic individuals might respond better to promotion-focused messages emphasizing potential gains, while less optimistic individuals might prefer prevention-focused messages highlighting the importance of avoiding negative outcomes. Recent research by Matz et al. (2023) supports the effectiveness of this personalized approach in promoting savings behavior.

Limitations and Future Directions

While our research provides valuable insights into the relationship between optimism, income, and saving behavior, it is important

to acknowledge the limitations of our studies and explore avenues for future research. One limitation of our research is the reliance on self-reported measures of saving behavior. Self-report measures can be subject to various biases, such as social desirability and recall bias, which may have affected our results (Karlan et al., 2016; Wilcox, 2008). Notably, in some studies, interviewers asked to see documentation or noted whether participants referred to documents to answer financial questions, potentially mitigating recall issues. Nonetheless, future research should aim to incorporate more objective measures of saving behavior, such as administrative data from financial institutions or experimental tasks that directly assess saving decisions. This is particularly important given the mixed findings from the objective bank-reported data in Study 3.

Another limitation is the potential for reverse causality in our cross-sectional studies. While we found consistent associations between optimism and saving behavior, cross-sectional designs cannot rule out the possibility that saving behavior influences optimism (rather than optimism influencing savings). Our longitudinal studies (Studies 4–8) help to address this issue by examining the relationship between optimism and future savings, while controlling for prior values of savings. Future research should continue to employ longitudinal designs with multiple waves of data collection to better establish the temporal dynamics and potential feedback loops between optimism and saving behavior.

Attrition and nonresponse bias are significant concerns in our longitudinal studies, potentially impacting the validity and generalizability of our findings if systematically related to optimism, income, or saving behavior (we discuss this topic in more detail in additional online material [https://osf.io/m283c/?view_only=413adc303ede47489c87f92d7d63dac6]). To mitigate these issues, we employed several strategies. Many of our studies (e.g., SOEP) used nationally representative samples, enhancing generalizability. Some, like the Understanding Society survey, implement sample replenishment to maintain representativeness over time. The application of sampling weights in Study 1 suggested our unweighted analyses may provide conservative estimates of the true relationships. While these approaches bolster confidence in our findings, we acknowledge the potential for residual bias. Future research could employ more sophisticated methodological techniques to further refine our understanding and account for nonrandom attrition. These might include pattern-mixture models to explicitly model the relationship between missing data patterns and outcomes, joint modeling of longitudinal and dropout processes, and multiple imputation techniques incorporating auxiliary variables related to both missingness and key constructs.

Future research should examine how race and ethnicity influence the optimism–savings relationship, particularly in the American context where significant financial disparities exist across racial groups. Racial minorities often face barriers to financial well-being, including lower incomes, less wealth accumulation, and limited access to financial services (Shapiro et al., 2013; Taylor et al., 2011). These disparities may modulate how optimism relates to saving behavior. However, our current data sets are ill-suited for this analysis. Some of the U.S. samples (e.g., WLS) overrepresent white participants, while the British and German samples lack racial diversity, limiting statistical power for meaningful comparisons. Future studies should employ more diverse samples to investigate whether the optimism–savings relationship is consistent across racial and ethnic groups or moderated by race-associated factors.

Conclusion

Our comprehensive investigation into the role of dispositional optimism in saving behavior yields three key insights: (a) optimism consistently predicts higher savings across diverse samples and methodologies, (b) this relationship is more pronounced among lower income individuals, and (c) the effect persists even when controlling for various demographic and economic factors. These findings call for a reevaluation of financial education strategies, suggesting that incorporating psychological interventions to boost optimism could yield significant benefits, especially for economically vulnerable populations. Further research is needed to develop and test such interventions in real-world settings.

References

Agarwal, S., Skiba, P. M., & Tobacman, J. (2009). Payday loans and credit cards: New liquidity and credit scoring puzzles? *American Economic Review*, *99*(2), 412–417. https://www.aeaweb.org/articles?id=10.1257/aer.99.2.412

Allison, P. D. (2009). *Fixed effects regression models*. Sage Publications. https://doi.org/10.4135/9781412993869

Angrist, J. D., & Pischke, J. S. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton university press.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277–297. https://doi.org/10.2307/2297968

Armor, D. A., & Taylor, S. E. (1998). Situated optimism: Specific outcome expectancies and self-regulation. *Advances in Experimental Social Psychology*, *30*, 309–379. https://doi.org/10.1016/S0065-2601(08)60386-X

Atienza, A. A., Stephens, M. A. P., & Townsend, A. L. (2004). Role stressors as predictors of changes in womens' optimistic expectations. *Personality and Individual Differences*, *37*(3), 471–484. https://doi.org/10.1016/j.paid.2003.09.016

Babyak, M. A. (2004). What you see may not be what you get: A brief, nontechnical introduction to overfitting in regression-type models. *Psychosomatic Medicine*, *66*(3), 411–421. https://doi.org/10.1097/01.psy.0000127692.23278.a9

Bernheim, B. D., Fradkin, A., & Popov, I. (2015). The welfare economics of default options in 401(k) plans. *American Economic Review*, *105*(9), 2798–2837. https://doi.org/10.1257/aer.20130907

Bertrand, M., Mullainathan, S., & Shafir, E. (2006). Behavioral economics and marketing in aid of decision making among the poor. *Journal of Public Policy & Marketing*, *25*(1), 8–23. https://doi.org/10.1509/jppm.25.1.8

Bjuggren, C. M., & Elert, N. (2019). Gender differences in optimism. *Applied Economics*, *51*(47), 5160–5173. https://doi.org/10.1080/00036846.2019.1610714

Blackwell, M., & Olson, M. P. (2022). Reducing model misspecification and bias in the estimation of interactions. *Political Analysis*, *30*(4), 495–514. https://www.mattblackwell.org/research/lasso-inters/

Bleidorn, W., Schwaba, T., Zheng, A., Hopwood, C. J., Sosa, S. S., Roberts, B. W., & Briley, D. A. (2022). Personality stability and change: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *148*(7–8), 588–619. https://doi.org/10.1037/bul0000365

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: A meta-analysis of randomized controlled studies. *BMC Public Health*, *13*(1), Article 119. https://doi.org/10.1186/1471-2458-13-119

Brown, S., & Taylor, K. (2014). Household finances and the 'Big Five' personality traits. *Journal of Economic Psychology*, *45*, 197–212. https://doi.org/10.1016/j.joep.2014.10.006

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Bullock, J. G., Green, D. P., & Ha, S. E. (2010). Yes, but what's the mechanism? (don't expect an easy answer). *Journal of Personality and Social Psychology*, *98*(4), 550–558. https://doi.org/10.1037/a0018933

Bun, M. J., & Sarafidis, V. (2015). Dynamic panel data models. In B. H. Baltagi (Ed.), *The Oxford handbook of panel data* (pp. 76–110). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199940042.013.0003

Cabrera-Álvarez, P., & Lynn, P. (2023). *Attrition in understanding society: The case of the General Population Sample and the Immigrant and Ethnic Minority Boost*. Understanding Society Working Paper Series.

Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., Ketcham, A. S., Moffat, F. L., Jr., & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: A study of women with early stage breast cancer. *Journal of Personality and Social Psychology*, *65*(2), 375–390. https://doi.org/10.1037/0022-3514.65.2.375

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality–social, clinical, and health psychology. *Psychological Bulletin*, *92*(1), 111–135. https://doi.org/10.1037/0033-2909.92.1.111

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge University Press.

Carver, C. S., & Scheier, M. F. (2014). Dispositional optimism. *Trends in Cognitive Sciences*, *18*(6), 293–299. https://doi.org/10.1016/j.tics.2014.02.003

Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review*, *30*(7), 879–889. https://doi.org/10.1016/j.cpr.2010.01.006

Chang, E. C., Chang, R., & Sanna, L. J. (2009). Optimism, pessimism, and motivation: Relations to adjustment. *Social and Personality Psychology Compass*, *3*(4), 494–506. https://doi.org/10.1111/j.1751-9004.2009.00190.x

Chang, E. C., D'Zurilla, T. J., & Maydeu-Olivares, A. (1994). Assessing the dimensionality of optimism and pessimism using a multimeasure approach. *Cognitive Therapy and Research*, *18*(2), 143–160. https://doi.org/10.1007/BF02357221

Chang, E. C., Maydeu-Olivares, A., & D'Zurilla, T. J. (1997). Optimism and pessimism as partially independent constructs: Relationship to positive and negative affectivity and psychological well-being. *Personality and Individual Differences*, *23*(3), 433–440. https://doi.org/10.1016/S0191-8869(97)80009-8

Christelis, D., Jappelli, T., & Padula, M. (2005). *Health risk, financial information and social interaction: The portfolio choice of European elderly households* (Working paper). University of Salerno.

Clarke, K. A. (2005). The phantom menace: Omitted variable bias in econometric research. *Conflict Management and Peace Science*, *22*(4), 341–352. https://www.jstor.org/stable/26273559

Cobb-Clark, D. A., & Schurer, S. (2012). The stability of big-five personality traits. *Economics Letters*, *115*(1), 11–15. https://doi.org/10.1016/j.econlet.2011.11.015

Csikszentmihalyi, M., Seligman, M. E., & Csikszentmihalyi, M. (2014). Positive psychology: An introduction. In M. Csikszentmihalyi (Ed.), *Flow and the foundations of positive psychology: The collected works of Mihaly Csikszentmihalyi* (pp. 279–298). Springer.

Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual Review of Psychology*, *62*(1), 583–619. https://doi.org/10.1146/annurev.psych.093008.100356

De Luca, G., Celidoni, M., & Trevisan, E. (2015). Item non response and imputation strategies in SHARE Wave 5. In F. Malter & A. Börsch-Supan (Eds.), *SHARE Wave 5: Innovations & Metodology* (pp. 85–100). MEA.

De Luca, G., & Rossetti, C. (2019). Weights and imputations. In M. Bergmann, A. Scherpenzeel, & A. Borsch-Supan (Eds.), *SHARE Wave 7 Methodology: Panel innovations and life histories* (pp. 167–189). DE.

Deaton, A. (1989). *Saving and liquidity constraints*. National Bureau of Economic Research. https://doi.org/10.3386/w3196

Donnellan, M. B., & Lucas, R. E. (2008). Age differences in the Big Five across the life span: Evidence from two national samples. *Psychology and Aging*, *23*(3), 558–566. https://doi.org/10.1037/a0012897

Dormann, C., & Griffin, M. A. (2015). Optimal time lags in panel studies. *Psychological Methods*, *20*(4), 489–505. https://doi.org/10.1037/met0000041

Ehrenfreund, M. (2015). Where the poor and rich really spend their money. *Washington Post*. https://www.washingtonpost.com/news/wonk/wp/2015/04/14/where-the-poor-and-rich-spend-really-spend-their-money/

Eichner, K. V., Kwon, P., & Marcus, D. K. (2014). Optimists or optimistic? A taxometric study of optimism. *Psychological Assessment*, *26*(3), 1056–1061. https://doi.org/10.1037/pas0000010

Eid, M., & Diener, E. (2004). Global judgments of subjective well-being: Situational variability and long-term stability. *Social Indicators Research*, *65*(3), 245–277. https://doi.org/10.1023/B:SOCI.0000003801.89195.bc

Elliott, J., & Shepherd, P. (2006). Cohort profile: 1970 British birth cohort (BCS70). *International Journal of Epidemiology*, *35*(4), 836–843. https://doi.org/10.1093/ije/dyl174

Exley, J., Doyle, P., Snell, M., & Campbell, W. K. (2021). OCEAN: How does personality predict financial success. *Journal of Financial Planning*, *34*(10), 68–86. https://www.financialplanningassociation.org/article/ocean-how-does-personality-predict-financial-success-OPEN

Felton, J., Gibson, B., & Sanbonmatsu, D. M. (2003). Preference for risk in investing as a function of trait optimism and gender. *The Journal of Behavioral Finance*, *4*(1), 33–40. https://doi.org/10.1207/S15427579JPFM0401_05

Fenton-O'Creevy, M., & Furnham, A. (2023). Personality and wealth. *Financial Planning Review*, *6*(2), Article e1158. https://doi.org/10.1002/cfp2.1158

Fischer, R., & Chalmers, A. (2008). Is optimism universal? A meta-analytical investigation of optimism levels across 22 nations. *Personality and Individual Differences*, *45*(5), 378–382. https://doi.org/10.1016/j.paid.2008.05.008

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218–226. https://doi.org/10.1037/0003-066X.56.3.218

Friedman, M. (1957). The permanent income hypothesis. *A theory of the consumption function* (pp. 20–37). Princeton University Press. https://doi.org/10.1515/9780691188485-005

Furnham, A. (1999). The saving and spending habits of young people. *Journal of Economic Psychology*, *20*(6), 677–697. https://doi.org/10.1016/S0167-4870(99)00030-6

Gallagher, M. W., Lopez, S. J., & Pressman, S. D. (2013). Optimism is universal: Exploring the presence and benefits of optimism in a representative sample of the world. *Journal of Personality*, *81*(5), 429–440. https://doi.org/10.1111/jopy.12026

Gallup. (2017). *Older Americans Buck trend of decreased homeownership*. Gallup.Com. https://news.gallup.com/poll/214514/older-americans-buck-trend-decreased-homeownership.aspx

Garbarino, E., & Strahilevitz, M. (2004). Gender differences in the perceived risk of buying online and the effects of receiving a site recommendation. *Journal of Business Research*, *57*(7), 768–775. https://doi.org/10.1016/S0148-2963(02)00363-6

Gladstone, J. J., Garbinsky, E. N., & Matz, S. C. (2022). When does psychological fit matter? The moderating role of price on self-brand congruity. *Social Psychological & Personality Science*, *13*(2), 595–607. https://doi.org/10.1177/19485506211028390

Gladstone, J. J., Matz, S. C., & Lemaire, A. (2019). Can psychological traits be inferred from spending? Evidence from transaction data. *Psychological Science*, *30*(7), 1087–1096. https://doi.org/10.1177/0956797619849435

Goldstein, J., & Vo, L. (2012, August 1). How the poor, the middle class and the rich spend their money. *NPR*. https://www.npr.org/sections/money/2012/08/01/157664524/how-the-poor-the-middle-class-and-the-rich-spend-their-money

Grable, J. E. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology*, *14*(4), 625–630. https://doi.org/10.1023/A:1022994314982

Grevenbrock, N. (2020). Dispositional optimism (and pessimism), wealth, and stock market participation. *Journal of Economic Psychology*, *81*, Article 102328. https://doi.org/10.1016/j.joep.2020.102328

Guiso, L., Sapienza, P., & Zingales, L. (2013). The determinants of attitudes toward strategic default on mortgages. *The Journal of Finance*, *68*(4), 1473–1515. https://www.eief.it/files/2013/07/guiso-sapienza_zingales_joff_2013.pdf

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods*, *20*(1), 102–116. https://doi.org/10.1037/a0038889

Haushofer, J., & Fehr, E. (2014). On the psychology of poverty. *Science*, *344*(6186), 862–867. https://doi.org/10.1126/science.1232491

Herd, P. (2018). Retention and attrition in the Wisconsin longitudinal study: Leveraging loyalty, science, and incentives in a 60 year longitudinal study. *Innovation in Aging*, *2*(Suppl. 1), Article 551. https://doi.org/10.1093/geroni/igy023.2033

Herd, P., Carr, D., & Roan, C. (2014). Cohort profile: Wisconsin longitudinal study (WLS). *International Journal of Epidemiology*, *43*(1), 34–41. https://doi.org/10.1093/ije/dys194

Herzberg, P. Y., Glaesmer, H., & Hoyer, J. (2006). Separating optimism and pessimism: A robust psychometric analysis of the revised Life Orientation Test (LOT-R). *Psychological Assessment*, *18*(4), 433–438. https://doi.org/10.1037/1040-3590.18.4.433

Hoffman, L., & Stawski, R. S. (2009). Persons as contexts: Evaluating between-person and within-person effects in longitudinal analysis. *Research in Human Development*, *6*(2–3), 97–120. https://doi.org/10.1080/15427600902911189

Hox, J. J. (2010). *Multilevel analysis: Techniques and applications* (2nd ed.). Routledge. https://doi.org/10.4324/9780203852279

Jacobsen, B., Lee, J. B., Marquering, W., & Zhang, C. Y. (2014). Gender differences in optimism and asset allocation. *Journal of Economic Behavior & Organization*, *107*, 630–651. https://doi.org/10.1016/j.jebo.2014.03.007

Joshi, M. S., & Carter, W. (2013). Unrealistic optimism: East and west? *Frontiers in Psychology*, *4*, Article 6. https://doi.org/10.3389/fpsyg.2013.00006

Karlan, D., McConnell, M., Mullainathan, S., & Zinman, J. (2016). Getting to the top of mind: How reminders increase saving. *Management Science*, *62*(12), 3393–3411. https://doi.org/10.1287/mnsc.2015.2296

Karlan, D., Ratan, A. L., & Zinman, J. (2014). Savings by and for the Poor: A research review and agenda. *Review of Income and Wealth*, *60*(1), 36–78. https://doi.org/10.1111/roiw.12101

Katona, G. (1975). *Psychological economics*. Elsevier.

Kool, W., & Botvinick, M. (2018). Mental labour. *Nature Human Behaviour*, *2*(12), 899–908. https://doi.org/10.1038/s41562-018-0401-9

Kubzansky, L. D., Kubzansky, P. E., & Maselko, J. (2004). Optimism and pessimism in the context of health: Bipolar opposites or separate constructs? *Personality and Social Psychology Bulletin*, *30*(8), 943–956. https://doi.org/10.1177/0146167203262086

Kuster, F., & Orth, U. (2013). The long-term stability of self-esteem: Its time-dependent decay and nonzero asymptote. *Personality and Social Psychology Bulletin*, *39*(5), 677–690. https://doi.org/10.1177/0146167213480189

Lench, H. C., Levine, L. J., Dang, V., Kaiser, K. A., Carpenter, Z. K., Carlson, S. J., Flynn, E., Perez, K. A., & Winckler, B. (2021). Optimistic expectations have benefits for effort and emotion with little cost. *Emotion*, *21*(6), 1213–1223. https://doi.org/10.1037/emo0000957

Lever, J., Krzywinski, M., & Altman, N. (2016). Points of significance: Model selection and overfitting. *Nature Methods*, *13*(9), 703–705. https://doi.org/10.1038/nmeth.3968

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, *101*(4), 847–861. https://doi.org/10.1037/a0024298

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, *52*(1), 5–44. https://doi.org/10.1257/jel.52.1.5

MacKinnon, D. P., & Lamp, S. J. (2021). A unification of mediator, confounder, and collider effects. *Prevention Science*, *22*(8), 1185–1193. https://doi.org/10.1007/s11121-021-01268-x

Magaletta, P. R., & Oliver, J. M. (1999). The hope construct, will, and ways: Their relations with self-efficacy, optimism, and general well-being. *Journal of Clinical Psychology*, *55*(5), 539–551. https://doi.org/10.1002/(SICI)1097-4679(199905)55:5<539::AID-JCLP2>3.0.CO;2-G

Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. *Science*, *341*(6149), 976–980. https://doi.org/10.1126/science.1238041

Marshall, G. N., Wortman, C. B., Kusulas, J. W., Hervig, L. K., & Vickers, R. R. (1992). Distinguishing optimism from pessimism: Relations to fundamental dimensions of mood and personality. *Journal of Personality and Social Psychology*, *62*(6), 1067–1074. https://doi.org/10.1037/0022-3514.62.6.1067

Matz, S. C., Gladstone, J. J., & Farrokhnia, R. A. (2023). Leveraging psychological fit to encourage saving behavior. *American Psychologist*, *78*(7), 901–917. https://doi.org/10.1037/amp0001128

Matz, S. C., Gladstone, J. J., & Stillwell, D. (2016). Money buys happiness when spending fits our personality. *Psychological Science*, *27*(5), 715–725. https://doi.org/10.1177/0956797616635200

Meevissen, Y. M., Peters, M. L., & Alberts, H. J. (2011). Become more optimistic by imagining a best possible self: Effects of a two week intervention. *Journal of Behavior Therapy and Experimental Psychiatry*, *42*(3), 371–378. https://doi.org/10.1016/j.jbtep.2011.02.012

Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. K. Kurihara (Ed.), *Post-keynesian economics* (pp. 388–436). Rutgers University Press.

Mullainathan, S., & Shafir, E. (2009). Savings policy and decision-making in low-income households. In M. Barr & R. Blank (Eds.), *Insufficient funds: Savings, assets, credit, and banking among low-income households* (Vol. 121, pp. 140–142). Sage Publications.

Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why having too little means so much*. Times Books/Henry Holt.

Mund, M., & Nestler, S. (2019). Beyond the Cross-Lagged Panel Model: Next-generation statistical tools for analyzing interdependencies across the life course. *Advances in Life Course Research*, *41*, Article 100249. https://doi.org/10.1016/j.alcr.2018.10.002

Nes, L. S., & Segerstrom, S. C. (2006). Dispositional optimism and coping: A meta-analytic review. *Personality and Social Psychology Review*, *10*(3), 235–251. https://doi.org/10.1207/s15327957pspr1003_3

Pearl, J. (2009). Causal inference in statistics: An overview. *Statistics Surveys*, *3*, 96–146. https://doi.org/10.1214/09-SS057

Peters, M. L., Flink, I. K., Boersma, K., & Linton, S. J. (2010). Manipulating optimism: Can imagining a best possible self be used to increase positive future expectancies? *The Journal of Positive Psychology*, *5*(3), 204–211. https://doi.org/10.1080/17439761003790963

Peterson, C. (2000). The future of optimism. *American Psychologist*, *55*(1), 44–55. https://doi.org/10.1037/0003-066X.55.1.44

Puri, M., & Robinson, D. T. (2007). Optimism and economic choice. *Journal of Financial Economics*, *86*(1), 71–99. https://doi.org/10.1016/j.jfineco.2006.09.003

Purol, M. F., & Chopik, W. J. (2021). Optimism: Enduring resource or miscalibrated perception? *Social and Personality Psychology Compass*, *15*(5), e12593. https://doi.org/10.1111/spc3.12593

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, *41*(1), 203–212. https://doi.org/10.1016/j.jrp.2006.02.001

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Rasmussen, H. N., Scheier, M. F., & Greenhouse, J. B. (2009). Optimism and physical health: A meta-analytic review. *Annals of Behavioral Medicine*, *37*(3), 239–256. https://doi.org/10.1007/s12160-009-9111-x

Raudenbush, S. W. (2002). Hierarchical linear models: Applications and data analysis methods. *Advanced quantitative techniques in the social sciences series*. Sage Publications.

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. *Psychological Bulletin*, *126*(1), 3–25. https://doi.org/10.1037/0033-2909.126.1.3

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*, *143*(2), 117–141. https://doi.org/10.1037/bul0000088

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*(1), 1–25. https://doi.org/10.1037/0033-2909.132.1.1

Robinson-Whelen, S., Kim, C., MacCallum, R. C., & Kiecolt-Glaser, J. K. (1997). Distinguishing optimism from pessimism in older adults: Is it more important to be optimistic or not to be pessimistic? *Journal of Personality and Social Psychology*, *73*(6), 1345–1353. https://doi.org/10.1037/0022-3514.73.6.1345

Rohrer, J. M. (2018). Thinking clearly about correlations and causation: Graphical causal models for observational data. *Advances in Methods and Practices in Psychological Science*, *1*(1), 27–42. https://doi.org/10.1177/2515245917745629

Rohrer, J. M., & Murayama, K. (2023). These are not the effects you are looking for: Causality and the within-/between-persons distinction in longitudinal data analysis. *Advances in Methods and Practices in Psychological Science*, *6*(1), Article 25152459221140842. https://doi.org/10.1177/25152459221140842

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*(3), 219–247. https://doi.org/10.1037/0278-6133.4.3.219

Scheier, M. F., & Carver, C. S. (1992). Effects of optimism on psychological and physical well-being: Theoretical overview and empirical update. *Cognitive Therapy and Research*, *16*(2), 201–228. https://doi.org/10.1007/BF01173489

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*(6), 1063–1078. https://doi.org/10.1037/0022-3514.67.6.1063

Scheier, M. F., Swanson, J. D., Barlow, M. A., Greenhouse, J. B., Wrosch, C., & Tindle, H. A. (2021). Optimism versus pessimism as predictors of physical health: A comprehensive reanalysis of dispositional optimism research. *American Psychologist*, *76*(3), 529–548. https://doi.org/10.1037/amp0000666

Schou, I., Ekeberg, Ø., Sandvik, L., & Ruland, C. M. (2005). Stability in optimism-pessimism in relation to bad news: A study of women with breast cancer. *Journal of Personality Assessment*, *84*(2), 148–154. https://doi.org/10.1207/s15327752jpa8402_04

Schwaba, T., Robins, R. W., Sanghavi, P. H., & Bleidorn, W. (2019). Optimism development across adulthood and associations with positive and negative life events. *Social Psychological & Personality Science*, *10*(8), 1092–1101. https://doi.org/10.1177/1948550619832023

Segerstrom, S. C. (2007). Optimism and resources: Effects on each other and on health over 10 years. *Journal of Research in Personality*, *41*(4), 772–786. https://doi.org/10.1016/j.jrp.2006.09.004

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Quasi-experiments: interrupted time-series designs. *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin.

Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, *338*(6107), 682–685. https://doi.org/10.1126/science.1222426

Shapiro, T., Meschede, T., & Osoro, S. (2013). The roots of the widening racial wealth gap: Explaining the black-white economic divide. *Research and policy brief*. Institute on Assets and Social Policy.

Sherraden, M. (1991). *Assets and the poor: A new American welfare policy*. M.E. Sharpe.

Steinhart, Y., & Jiang, Y. (2019). Securing the future: Threat to self-image spurs financial saving intentions. *Journal of Personality and Social Psychology*, *117*(4), 741–757. https://doi.org/10.1037/pspa0000159

Sullivan, A., Brown, M., Hamer, M., & Ploubidis, G. B. (2023). Cohort profile update: The 1970 British Cohort Study (BCS70). *International Journal of Epidemiology*, *52*(3), e179–e186. https://doi.org/10.1093/ije/dyac148

Taylor, M. P., Jenkins, S. P., & Sacker, A. (2011). Financial capability and psychological health. *Journal of Economic Psychology*, *32*(5), 710–723. https://doi.org/10.1016/j.joep.2011.05.006

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., & Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes*, *5*(1), Article 63. https://doi.org/10.1186/1477-7525-5-63

Tindle, H. A., Chang, Y. F., Kuller, L. H., Manson, J. E., Robinson, J. G., Rosal, M. C., Siegle, G. J., & Matthews, K. A. (2009). Optimism, cynical hostility, and incident coronary heart disease and mortality in the Women's Health Initiative. *Circulation*, *120*(8), 656–662. https://doi.org/10.1161/CIRCULATIONAHA.108.827642

Trzesniewski, K. H., Donnellan, M. B., & Robins, R. W. (2003). Stability of self-esteem across the life span. *Journal of Personality and Social Psychology*, *84*(1), 205–220. https://doi.org/10.1037/0022-3514.84.1.205

University of Colorado Office of Research Integrity. (2019). *Investigator Manual HRP-910* (002).

U.S. Census Bureau. (2021). *Quarterly Residential Vacancies and Homeownership, Fourth Quarter 2022* (No. CB23-08).

Usami, S., Murayama, K., & Hamaker, E. L. (2019). A unified framework of longitudinal models to examine reciprocal relations. *Psychological Methods*, *24*(5), 637–657. https://doi.org/10.1037/met0000210

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel study (SOEP): Evolution, scope and enhancements. *Journal of Contextual Economics–Schmollers Jahrbuch*, *1*(1), 139–169.

Wilcox, N. T. (2008). Against simplicity and cognitive individualism. *Economics and Philosophy*, *24*(3), 523–532. https://doi.org/10.1017/S0266267108002137

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT Press.

Yzerbyt, V. Y., Muller, D., & Judd, C. M. (2004). Adjusting researchers' approach to adjustment: On the use of covariates when testing interactions. *Journal of Experimental Social Psychology*, *40*(3), 424–431. https://doi.org/10.1016/j.jesp.2003.10.001

Received April 3, 2023
Revision received August 22, 2024
Accepted September 3, 2024 ■

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.