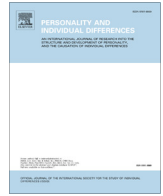




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Extraverted populations have lower savings rates [☆]

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ABSTRACT

Savings rates in the U.S. have reached an historic low, posing challenges to long-term economic well-being. Among individuals, impulsive spending is associated with preferences for immediate gratification, driven by a heightened sensitivity to immediate rewards. Three studies examined whether population levels of trait Extraversion, reflecting dispositional sensitivity to rewards, are associated with aggregate savings rates. In Study 1, cross-cohort increases in U.S. Extraversion, assessed from 16,846 individuals over 28 years, were associated with declining personal savings rates. In Study 2, regional variation in Extraversion as assessed from a sample of 619,397 participants was negatively associated with state-level household saving, although only Openness remained a significant predictor when all traits were simultaneously entered into a regression model. In Study 3, higher nationally-aggregated Extraversion predicted lower gross national savings in a global sample of 17,837 individuals from 53 nations.

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1. Introduction

Savings rates in the United States have been hovering at historically low levels not seen since the great depression. Precipitous declines in national and personal savings since the mid-1980s indicate that Americans have been spending a larger share of their income on immediate consumption, rather than saving their resources for the future. These declining savings rates have been accompanied by increasing debt burdens. At the end of 2012, the national debt in the U.S.A. was 103% of GDP, while household debt was 111% of disposable income. Similar household debt ratios were observed in many of the other OECD nations (Organisation for Economic Co-Operation and Development), including 165% for Canada and 152% for the United Kingdom (OECD, 2013). High levels of debt accompanied by low savings pose many economic risks, including vulnerability to rising interest rates, economic downturns, and higher levels of unemployment. As defined benefit pension plans become less common, personal saving habits play an even stronger role in determining financial well-being during retirement (Butrica, Iams, Smith, & Toder, 2009). At the national level, rising debt levels can also pose serious challenges to long-term economic stability (Leigh, Ignaz, Simon, & Topalova, 2012). Understanding the factors that influence savings rates is thus an important

research goal, as it may help us to forecast large-scale social and economic trends.

A variety of explanations have been proposed for the savings rate decline over the past 30 years, focusing primarily on factors such as the heightened mobility of capital, novel financial instruments, and the economic consequences of an aging population in more developed nations. Although informative, such economic variables have not been able to fully explain the savings rate decline (Guidolin & Jeunesse, 2007). Given that saving behavior ultimately depends upon individual choices, a psychological perspective on declining savings rates may help to provide insights that complement those obtained from purely economic analyses. Such an idea is supported by the growing literature in behavioral economics suggesting that psychological factors play an important role in shaping saving behavior (Gärling, Kirchler, Lewis, & van Raaij, 2009; Wärneryd, 1999). Additional support for this notion comes from preliminary research suggesting that some of the person-level variability in saving behavior is attributable to genetic factors (Cronqvist & Siegel, 2011), indicating an important role for individual differences in psychological processes.

Most psychological accounts of saving behavior have been heavily influenced by the delay of gratification paradigm, in which individuals are asked to make choices between small immediate rewards and larger delayed rewards (Metcalf & Mischel, 1999; Mischel, Shoda, & Rodriguez, 1989). Analysis of such choices enables the calculation of a temporal discounting curve, which reflects the rate at which the subjective value of a reward decreases as the delay to obtaining it increases (Ainslie, 1991;

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Frederick, Loewenstein, & O'Donoghue, 2002; Laibson, 1997). People differ tremendously in the rate at which they discount delayed rewards, with implications for their pursuit of immediate or delayed gratification. While some people indulge their desires as soon as they arise, others forgo such impulses in the hope of realizing larger gains in the future. An inability to delay gratification is associated with many impulsive outcomes, including gambling, substance abuse, weight gain, relationship infidelity, and lower academic performance (Kirby, Winston, & Santiesteban, 2005; Reimers, Maylor, Stewart, & Chater, 2009; Reynolds, 2006). Tendencies toward immediate gratification likewise predict lower credit scores (Meier & Sprenger, 2012) and impulsive spending habits (Joireman, Sprott, & Spangenberg, 2005).

These preferences for immediate rewards are trait-like, characterized by high levels of within-person stability (Odum, 2011) and heritability (Anokhin, Golosheykin, Grant, & Heath, 2011). The tendency to prefer immediate gratification over delayed rewards is in fact associated with greater Extraversion (Hirsh, Guindon, Morisano, & Peterson, 2010; Hirsh, Morisano, & Peterson, 2008; Ostaszewski, 1996, 1997), a dimension of personality associated with social potency and a heightened sensitivity to potential rewards (Elliot & Thrash, 2002; Lucas, Diener, Grob, Suh, & Shao, 2000; Watson & Clark, 1997). This heightened reward sensitivity among extraverts has been linked to a more responsive dopaminergic system (Cohen, Young, Baek, Kessler, & Ranganath, 2005; Depue & Collins, 1999; Wacker, Chavanon, & Stemmler, 2006), which serves as the brain's reward system and supports incentive motivation (Berridge & Robinson, 1998; Spanagel & Weiss, 1999). Dopaminergic neurons are more sensitive to immediate rewards and tend to be less responsive to delayed ones (Kobayashi & Schultz, 2008). Consequently, greater activity in the dopaminergic reward system drives preferences for immediate gratification during intertemporal choices, such that immediate rewards become more salient than long-term gains (McClure, Laibson, Loewenstein, & Cohen, 2004). When asked to choose between smaller immediate and larger delayed rewards, extraverts are thus more likely to choose the smaller but immediate option (Hirsh et al., 2010, 2008).

As a result of their heightened preference for immediate gratification, extraverts also tend to engage in more impulsive spending behaviors compared to introverts, who tend to make more deliberative financial decisions (Verplanken & Herabadi, 2001). A survey of 2800 Dutch households extended this research by revealing that households with extraverted members tend to save less over time compared to more introverted households (Nyhus & Webley, 2001). Among British undergraduate students, Extraversion is likewise associated with an increased use of overdrafts and financial borrowing in order to support personal spending habits (Harrison & Chudry, 2011). The tendency for extraverts to spend money on immediate rewards rather than saving funds for the future is also reflected in their stronger desires to maintain an extravagant lifestyle (McClure, 1984) and engage in conspicuous consumption (Mooradian & Olver, 1996). More generally, extraverts are more likely than introverts to value hedonic enjoyment and a high standard of living as important life goals (Roberts & Robins, 2000). Consistent with the research relating Extraversion to higher temporal discounting rates, extraverts appear to allocate more of their financial resources toward the enjoyment of immediate consumption rather than saving their funds for the future.

If greater sensitivity to immediate rewards leads extraverted individuals to behave more impulsively in their financial decisions, could the additive effect of these individual choices contribute to reduced savings at the population level? Recent analyses support the notion that the aggregated personality traits of a population can predict a variety of important social outcomes, including voting patterns, health indices, and environmental sustainability

(Hirsh, 2014; Rentfrow, Gosling, & Potter, 2008). However, it is not necessarily the case that aggregate-level relationships will always be the same as those observed at the individual level (Chan, 1998). Generalizing individual-level dynamics to higher levels of analysis without empirical evidence for their equivalence has been described as the reverse ecological fallacy, and can produce misleading predictions about population-level dynamics (Hofstede, 2001). A study might observe, for example, that obesity rates tend to be lower among wealthier individuals. It would nonetheless be a mistake to assume that wealthier nations are necessarily characterized by lower obesity rates when the opposite may in fact be true. Although there is evidence for Extraversion's role in shaping individual saving behavior, it thus remains an important question as to whether this relationship would also be observed at the aggregate level. In the current research, three studies were conducted to examine whether population differences in Extraversion, reflecting collective variation in sensitivity to immediate rewards, can predict aggregate savings rates using cross-temporal (Study 1), regional (Study 2), and cross-national (Study 3) data.

2. Study 1

Personality is partially influenced by the sociocultural context in which it develops, such that distinct birth cohorts can express substantial trait differences over time (Twenge, 2008). A cross-temporal analysis was performed using data collected over a 28-year period within the United States to examine whether cohort changes in Extraversion over time could partially account for declines in the savings rate. Mean Extraversion levels were obtained from a meta-analysis of personality data collected between 1966 and 1993 from 16,846 college students (Twenge, 2001) using the Eysenck Personality Inventory (Eysenck, 1968) and Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975). These data provided average Extraversion scores for 23 separate years during this period. Personal savings rates for these same years (calculated as personal saving as a percentage of disposable personal income) were obtained from the Federal Reserve Bank of St. Louis. As shown in Fig. 1, the average yearly level of Extraversion within the American population was negatively associated with personal savings rates during this time, $r(21) = -.50$, $p = .016$. A bootstrapped correlation analysis with 5000 resamples confirmed a robust relationship (95% bias-corrected CI from $-.79$ to $-.11$).

Despite the promising nature of these initial results, the analysis is inherently limited by the fact that many other variables also changed during this time period and may therefore be potential confounds. The changes in Extraversion and the personal savings rate during this period were both relatively linear, suggesting that any number of factors that changed in a linear fashion during the same time may account for the observed correlation. Additionally, data was only available for Extraversion and not for any of the other major personality traits. Studies 2 and 3 address these limitations by employing cross-sectional analyses that complement the cross-temporal approach, while also taking into account the full range of personality traits.

3. Study 2

While Study 1 examined cohort changes in Extraversion throughout the United States, Study 2 examines whether regional differences in this trait are related to household saving behavior. Aggregated levels of the five major personality trait dimensions—Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness—for each of the 50 states were obtained from a database of 619,397 respondents whose personalities were assessed between

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