Vivid Future, Present Decisions?

Future Self-Continuity in Relation to Economic Decision-Making, Consumption, and Valued Living

Jonas Hjalmar Blom

Faculty of Arts and Social Sciences

Psychology

DOCTORAL THESIS | Karlstad University Studies | 2026:48

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urn:nbn:se:kau:diva-112274

ISSN 1403-8099

ISBN 978-91-7867-753-5 (print)

ISBN 978-91-7867-754-2 (pdf)

https://doi.org/10.59217/cfnz8927

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Distribution:
Karlstad University
Faculty of Arts and Social Sciences
Department of Social and Psychological Studies
SE-651 88 Karlstad
+46 54 700 10 00

Print: Universitetstryckeriet, Karlstad 2026

WWW.KAU.SE

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Doctoral Dissertation in Psychology
Service Research Center, Karlstad University, 2026

Abstract

People often know what climate, health, and financial challenges require of them, yet tend to favor the present over the future. One proposed reason is weak future self-continuity (FSC): the distant future self is perceived as abstract, remote, and almost like another person. Across three papers, this thesis examines whether FSC can be strengthened and how it relates to attitudes and observed economic behavior.

Paper 1 introduces the Day Preconstruction Method (DPM), a brief writing exercise in which participants describe a day in their distant future. In four pre-registered experiments (N = 1,624), the DPM reliably increased FSC but did not affect monetary intertemporal choice. Participants who preconstructed a distant-future day reported greater valued living one week later, partially mediated by FSC, although the evidence was inconclusive.

Paper 2 linked survey responses to debit-card transaction data from Swedish single-adult households (n = 3,544). In pre-registered structural equation modeling, future self-vividness was positively associated with environmentally friendly and long-term economic attitudes and showed small positive associations with health-related spending and, contrary to prediction, with consumption-based CO_2 emissions. No association with savings was detected.

Paper 3 applied random forest modeling with SHAP values to a random sample (N = 1,040) with linked registry and transaction data. Vividness was associated with age, pro-environmentalism, and political conservatism, whereas no association was detected with any recorded spending category.

Together, the findings indicate that the connection to the future self is malleable and consistently linked to future-oriented attitudes, while its links to observed economic behavior were weak or undetected. A strong connection to the future self may be a foundation for behavior change in some domains.

Sammanfattning

Människor vet ofta vad som krävs av dem gällande framtida utmaningar inom klimat, hälsa och ekonomi, men prioriterar ändå nuet framför framtiden. En tänkbar förklaring är en svag framtida jag-kontinuitet. Det framtida jaget uppfattas som abstrakt och nästan som en annan person. Denna avhandling undersöker hur denna framtida jag-kontinuitet kan stärkas, samt hur den hänger samman med attityder och faktiska beteenden.

Artikel 1 undersöker *Day Preconstruction Method* (DPM), en kort skrivövning där deltagarna får beskriva en dag i sin avlägsna framtid. I fyra förregistrerade experiment (N = 1 624) stärkte DPM konsekvent framtida jag-kontinuiteten utan att påverka ekonomiska beslut. DPM bidrog även till att deltagarna levde mer i enlighet med sina värderingar efter skrivövningen, ett samband som delvis medierades av framtida jag-kontinuitet, även om resultaten inte var entydiga.

Artikel 2 kopplade enkätsvar till transaktionsdata från svenska enpersonshushåll (n = 3 544). Förregistrerad strukturell ekvationsmodellering (SEM) visade att ett tydligt framtida jag var positivt associerat med miljövänliga och långsiktiga ekonomiska attityder, samt svaga positiva samband med hälsorelaterade köp och, tvärtemot förväntningarna, med högre konsumtionsbaserade koldioxidutsläpp. Inget samband med sparande kunde påvisas.

Artikel 3 tillämpade random forest-modellering med SHAP-värden på ett slumpmässigt urval (N = 1 040) med kopplade register- och transaktionsdata. Tydligheten i bilden av det framtida jaget var kopplad till ålder, en miljövänlig självbild och politisk konservatism, medan inget samband kunde påvisas med någon registrerad konsumtionskategori.

Sammantaget visar resultaten att kopplingen till det framtida jaget är formbar och kan relatera till framtidsorienterade attityder, medan sambanden med faktiska ekonomiska beteenden var svaga eller inte kunde påvisas. En stark koppling till det framtida jaget kan utgöra en grund för beteendeförändring inom vissa domäner.

Acknowledgements

In recent years, I've sometimes said that "being a PhD student is the best thing in the world! No schedule, no salary, no boss… therefore, no problem!" However, I must add that when you're a PhD student, you have supervisors. Since I got Per "Pelle" Kristensson and Erik Wästlund as mine, I have probably been the luckiest PhD student in the world. Both of you have shared your knowledge of psychological research and combined it with a great dose of academic street-smartness. Always with your warm and open-minded attitude toward my wishes, ambitions, and situation. Thank you.

Some academic fellows, near and far, have blazed my academic trails in one way or another. Trails that I now get to continue along. Valgeir Thorvaldsson, for helping me to see the beauty of statistics a little more clearly. Hal Hershfield, the big future self-continuity chief, who shared time, knowledge, and ideas over video chats across ten time zones. Constantine Sedikides and Tim Wildschut for telling me, very frankly, not to "put the wagon in front of the horse". Thank you.

David Andersson. Thank you for letting my random e-mail lead to a phone call and then, via an unexpected encounter at the local playground, inviting me to be a part of the grooviest data collection ever (and being my unfailing gatekeeper to the Trusted Research Environment). Jakob Enlund is also worth a big thank you for helping me to think straight about findings and interpretations of consumption data.

It's a pity that I couldn't visit Karlstad University more often. Every time I did, it filled me with a great sense of belonging, new thoughts, and many laughs. Thank you to all of you at the Service Research Center and the Department of Social and Psychological Studies. An extra thank you to Henrik Johansson Rehn, brother from another mother, and Frida Skarin, sister from another mister, and Daniel Wallsten, one of the most intellectually open and persistent people I've ever met.

I am also blessed with friends who are never more than either a call or a short walk away.

- All the Masthugget dads: A beer next week? Okay, next month? Well, how about next year, then?!
- Pelle Martinsson: I hereby hold you responsible for the fact that Riff Raff is cited in a doctoral dissertation in psychology.
- Ulf Pelow: Now I have all the time in the world for that hike. But do you?
- Niklas Laninge: With you, I'm a Märklin train next to a Duracell rabbit.
- Sven Hassler: Not just a renaissance man. The renaissance man.
- Coaches and companions at Crossfit Göta: After all those days of heavy thinking, it has been a joy to do some heavy lifting.
- All buddies from Karlskoga: One cannot look into the future without having strong roots.
- Friends and colleagues from the parachute ranger squadron: Will, Courage, and Perseverance. Always and everywhere.

My relatives, who were links in the chain of life before me. Rune, Gertrud, Joel and Kerstin, and all the blacksmiths, farmers, soldiers, carpenters, watchmakers, maids, and wives that make up my ancestors. It is a beautiful thing to pass our collective continuity on, by forging new links in that chain. I try the best I can to take care of your legacy.

Eva Sahlberg Blom, you have been with me since I took my first breath. Almost since that day, you have drilled me in correct APA referencing and, more than that, expressed the thrill of following one's curiosity by doing academic research. You did nothing to hide your engagement when I told you that I had landed a PhD position, and that engagement is surely a contagious one. Thank you.

Per Blom, you have always encouraged me to do hard things. And, more than that, you have supported me along the way. You waited in clarinet rehearsal rooms with squeaky sounds, you joined me down ski slopes in freezing cold (you'll go first, I'll wait down there), and you stood by football fields in heavy rain. You will stand by me forever. Thank you.

Maja Blom, thank you for being a pioneer and role model, especially in my most formative years. In many ways, probably more than you realize, you have helped to shape my interest in reading, thinking and writing. Thank you.

Bessie and Valentin. I was partly responsible for inviting you to this great adventure we call life. In return, you have given me a direction and a purpose. A direction into the distant future that I want to walk together with you, whatever we may come across, and a purpose that brings me up from the dark depths and pulls me down from the dizzying heights. Thank you.

Åsa Nordström. When all the tiny buds have burst into bloom, we will remember when each one was small and tender, and what lay in front for us the summer that never ended. And when all the leaves have fallen from our trees, our birds will still chirp out in the world. A world that seemed so harsh to me, until you set me free.

Declaration of AI-assisted technologies in the writing process

After writing the first draft, the AI tool Grammarly (version 1.187.0.0 and earlier) was used to improve linguistic clarity, and Claude (version 1.52386.0 and earlier) was used to find gaps in reasoning and for suggestions on how to improve clarity. No substantive content was generated by the AI tools. I take full responsibility for all aspects of the work.

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I. Blom, J. H., Wästlund, E., & Kristensson, P. (2026). The Day Preconstruction Method: A Novel Method to Strengthen Future Self-Continuity. Journal of Experimental Psychology: Applied, 32(3), 460–483. https://doi.org/10.1037/xap0000574 *Reprinted with permission from American Psychological Association (APA).*

II. Blom, J. H., Kristensson, P., Wästlund, E., Enlund, J., & Andersson, D. (2026). Future Self-Vividness, Attitudes and Consumption: Linking Future Self-Vividness to Consumer Attitudes and Sustainability, Health Spending, and Savings from Real Transaction Data. Unpublished manuscript.

III. Blom, J. H. (2026). Exploring the Distribution and Correlates of Future Self-Vividness in a Swedish Sample with Linked Registry and Transaction Data. Unpublished manuscript.

Introduction

> It's been a long, a long time comin', but I know, a change gon' come
>
> Sam Cooke

Research Problem and Empirical Context

If you were an average newborn human in 1900, your life expectancy would have been 32 years. Today, it has doubled to over 70 years (Dattani et al., 2025). Some genetic scholars argue that, thanks to the resetting of cellular aging in the human body, the first person to live to 150 has already been born (Powell, 2023). With increasing life expectancy, most people have a longer future to anticipate than ever before. Humans are one of the few species that can engage in *mental time travel* and project themselves into an anticipated or imagined future. This allows us to prepare for future needs (Breeden et al., 2016). But our psychology and culture mainly evolved in a state in which the distant future was neither interesting nor necessary to consider (Hölscher, 2018). Today, we as humans and humanity face challenges that require a long-term perspective on our individual and societal futures, particularly regarding climate change, health, and financial stability.

The global mean surface temperature in 2025 was 1.44 °C (± 0.13 °C) above the 1850–1900 average, and the three-year mean for 2023–2025 was 1.48 °C (World Meteorological Organization, 2026). These figures indicate that humanity is on track to fail to limit global temperature rise to 1.5 °C, as stated in the Paris Agreement (UNFCCC, 2015). The increase in temperature leads to deaths from extreme weather events, food insecurity, and the increased spread of diseases (Lee et al., 2023). Most people in high-emitting countries understand that climate change is real and human-caused and want to do more collectively to stop it (Dechezleprêtre et al., 2025). Still, this understanding seldom translates into behavioral change, such as more sustainable consumption (White et al., 2019).

As people live longer, the prevalence and cost of chronic disease continue to rise. The cumulative global economic burden of the five leading noncommunicable diseases from 2011 to 2030 has been estimated at USD 47 trillion, a figure that combines medical costs, lost income, and

lost economic output (Hacker, 2024). For scale, that is roughly five times current annual global health expenditure (World Health Organization, 2023). Noncommunicable diseases, among them cardiovascular disease, chronic respiratory disease, and type 2 diabetes, killed at least 43 million people in 2021, accounting for about three-quarters of all non-pandemic deaths worldwide (World Health Organization, 2025). Much of that burden is attributable to behavioral risk factors, but many people fail to make the necessary behavior change (GBD 2015 Risk Factors Collaborators, 2016).

In Europe alone, 40 to 60 million people are in personal debt due to various types of consumer loans. The supply and demand for debt are expected to increase further, due to aggressive marketing strategies, refined financial services, and shifts in sociocultural norms (Ferretti & Vandone, 2019). Indebtedness is associated with a range of adverse psychological effects, including decreased job performance (Lea, 2021), reduced mental capacity (De Bruijn & Antonides, 2021), and increased depression, anxiety, violence, and addictions. It also has a detrimental impact on child development (Achtziger, 2022). Even though most people understand the importance of sufficient savings, many consumers either do not save money or save less than needed to avoid future debt or to cover regular expenses in retirement (Greenberg & Hershfield, 2019).

In other words, people usually know what is needed to address climate, health, and financial challenges, but they often fail to act accordingly. One reason is our psychological tendency to prefer the present over the distant future. Of spontaneous everyday thoughts, only a tiny portion is directed toward the future more than a year from the present (Baumeister et al., 2020). Psychological research consistently shows that most people exhibit a present bias, preferring small immediate rewards to larger delayed ones (Frederick et al., 2002). Still, some people exert a high degree of self-control: the effortful regulation of thoughts, feelings, and actions to resist present temptations and instead choose long-term rewards (Duckworth et al., 2019). In our “age of excess,” with constant access to tempting food, social media, streaming services, and one-click shopping, it is hard for people to resist short-term temptations (Akst, 2011). As a result, many people struggle with self-control

and need structural and cognitive strategies to help them. Duckworth et al. (2018) highlight a cognitive strategy that is interesting for its potential as a psychological foundation for behavior change in future-oriented contexts, such as sustainability, health, and personal finance.

The strategy is to strengthen *future self-continuity*.

Purpose of this research

Research shows that people perceive their *distant future self*, the person they expect to be years or decades from now, in more abstract terms than their near future self (Wakslak et al., 2008). It has also been shown that people attribute less value to it (Bartels & Rips, 2010) and often view it as another person (Ersner-Hershfield, Wimmer, et al., 2009; Sirois & Pychyl, 2013). Is it possible to shift this perception of the distant future self? And will that shift result in re-prioritization from short-term gains to long-term benefits? I want to approach these questions in three different layers, each addressing a question the previous one raises but cannot answer.

The first layer is to establish whether future self-continuity can be strengthened through an easily administered method, simple enough for use outside a laboratory. As I will describe soon, existing interventions rely on technology or time-consuming methods that limit their applicability and ease of replication. My first paper in this dissertation describes the development and testing of a writing exercise, the Day Preconstruction Method, across four pre-registered experiments and examines whether strengthening the connection also affects intertemporal choice and valued living.

The second layer concerns whether the construct is associated with future-oriented behavior when that behavior is observed rather than self-reported. This follows directly from the first, since an intervention that reliably shifts a self-report measure is of limited interest if that measure bears little relation to what people do. In my second paper, I address this question by linking survey measures of future self-vividness, a subcomponent of FSC, to card transaction data in a large sample, across the three domains selected in advance from theory and previous findings: sustainability, health, and savings.

The third layer establishes what future self-vividness is associated with when theory does not indicate where to look. The answers in Paper 2 are conditional on its choice of three pre-specified domains. If future self-vividness is related to something else, that design would not detect it. In the third paper, I therefore take an entirely exploratory approach and use data-driven methods to search a large set of self-report items and spending categories for correlates of vividness, without deciding in advance which of them should matter.

My aim with this progression is to broaden the scope from whether the construct can be changed, to whether it is associated with behavior where theory indicates it could, and to what it is related to across the full range of the data. The three papers relate to one another in this way. Taken together, they broaden and deepen the understanding of people's continuity between their present and distant future self, and address whether weak links to actual behavior reflect the construct itself or the outcomes chosen to test it.

Outline of this thesis

I begin by presenting the overall theoretical framework for future self-continuity (FSC), interventions to enhance it, and how I aim to fill gaps in the current knowledge. Thereafter, I outline the methodology I use in my research. I discuss the current state of psychological science, in which researchers have relied too heavily on self-reports rather than actual behavior. I also highlight the ongoing replication crisis, which has revealed issues such as p-hacking and small sample sizes, and explain my approach to addressing these challenges.

Then, I review the findings of my empirical investigations included in this thesis. Paper 1 describes a writing exercise to strengthen FSC, *the Day Preconstruction Method*, and addresses whether it affects intertemporal monetary choices and changes in valued living. Paper 2 investigates how a specific aspect of FSC, vividness, is linked to consumer attitudes and behavior by analyzing a dataset that combines transaction data with survey responses from 3,544 people. Paper 3 examines the distribution and correlates of future self-vividness in a random Swedish sample, analyzing both attitude and consumption data using random forest modeling.

After reviewing the studies, I move on to the general discussion, where I highlight the theoretical, practical, and methodological contributions of my research, along with its limitations and potential future directions for researchers of future-related decisions, behaviors, and consumption.

Conceptual Background

> And it's never gonna be the same, 'cause the years are falling by like the rain
>
> Oasis

The (dis)connection to the future self

The mere act of projecting oneself into the distant future, years or decades away, is one of the most sophisticated mental acts, and one of the skills that separate humans from most species (though not all). Future-oriented mental time travel is highly beneficial from an evolutionary perspective because it enables individuals and species to respond flexibly to threats and opportunities in natural and social environments, such as changes in food availability, breeding opportunities, and social hierarchies (Dere, 2026). One of psychology's founding fathers, William James, stated in *The Principles of Psychology* (1890) that the memories linking the past and the present, and the imaginative abilities that connect the present with the future, are a foundation of human psychology. They underpin personal identity and a sense of self. Ever since then, both some specialists (Bruner, 1990; Erikson, 1968) and many laypeople have held the impression that there is a kernel of the self that persists over time, even as our physical bodies and psychological concepts change. In other words, a *diachronic* identity that is not situated in a particular moment but persists over time. If this were the case, that "the self was always the same self", then it should be quite easy for people to act in ways that benefit their future self. Why? Because it would be the same person psychologically.

The philosopher Derek Parfit (1971) challenged the idea of a self that persists over time. Instead, he argued that we can experience multiple selves during our lives. He suggested that our future is made up not of one *true self*, but of *many possible selves*. Some of these future selves may share desires, wants, and values with our current self, while others may differ greatly. Therefore, it can sometimes be rational for the

present self to ignore a future self that wants something completely different[1].

Over time, the succession of several overlapping selves across the past, present, and future forms a person's identity. Consequently, psychological continuity is essential for acting in accordance with one's preferred future self. This continuity can be established by linking lower-level concepts, such as memories, emotions, and social relationships, over time and abstracting them into a higher-level sense of selfhood (Parfit, 1984). Modern scientific psychology describes this link between present and future selves as *future self-continuity* (Hershfield, 2011). This is a part of a broader concept called global self-continuity, an individual's sense of connection among their past, present, and future selves (Sedikides et al., 2023). FSC is theorized to consist of three distinct aspects, namely *similarity*, *vividness,* and *liking*, a distinction that is also psychometrically supported (Han et al., 2025; Sokol & Serper, 2020).

Research using neuroscientific and psychological methods is consistent with Parfit's view, suggesting that many possible future selves exist and that acting on behalf of all of them is sometimes counterintuitive. For example, people tend to adopt a more observer-like perspective toward their future selves than toward their current self, attributing the future selves' behavior to dispositional rather than situational factors, much as they view others in the present (Pronin & Ross, 2006). A study by Ersner-Hershfield, Wimmer, et al. (2009) using fMRI found that individuals who imagined their future selves showed brain activation patterns similar to those when imagining a present-day stranger, compared with imagining their current selves. Furthermore, people apply the same decision-making process to their future selves as they do to others in the present, but not to themselves, in real-life choices such as drinking unpleasant liquids, tutoring a peer during exam week, or

[1] To give a mundane example: the future self of tomorrow might want today's self to eat a healthy dinner and go to bed early. But today's self ignores this when there's a potentially extraordinarily fun party with free drinks and a live band playing party songs all night, and therefore the present self doesn't care what tomorrow's future self wishes.

delaying a reward for more money later instead of accepting less now (Pronin et al., 2008). However, research by Molouki and Bartels (2020) adds nuance to future-self decision-making, showing that allocating money to the future self can differ from allocating money to others in the present.

Taken together, these findings highlight the counterintuitive nature of connecting with and caring for the future self.

The role of future self-continuity in life

FSC is linked to future-oriented intentions and behaviors. A weak FSC is associated with a range of psychiatric symptoms (Sokol & Serper, 2019b), and an integrative review by Roepke and Seligman (2016) concluded that poor generation of possible futures, poor evaluation of them, and negative beliefs about them are three driving forces behind depression. On the other hand, a strong FSC is associated with more positive self-images (Hamilton & Cole, 2017), saving for the future (Ersner-Hershfield, Garton, et al., 2009), better subjective health (Rutchick et al., 2018, Study 1), less impulsive consumption (Bartels & Urminsky, 2011), improved academic performance in terms of GPA (Adelman et al., 2017), more ethical decisions and resistance to lies and bribes (Hershfield et al., 2012), and a higher sense of meaning in life in both Western (Hong et al., 2024, Study 1) and Eastern samples (Xue et al., 2024). In a study by Demirli et al. (2025), FSC was the only significant psychological variable predicting personal recovery among patients with schizophrenia.

In other words, a weak FSC seems undesirable and maladaptive, whereas a strong FSC is desirable for several reasons. So, can FSC be strengthened?

Interventions to strengthen connection to the future self

Research has explored various techniques to enhance people's FSC and alter their present behavior in favor of their future self. For example, interacting with age-progressed renderings of their future selves in a virtual reality environment increased participants' sense of FSC and their willingness to accept later rather than immediate monetary rewards (Hershfield et al., 2011). In a study by Ganschow et al. (2021),

participants engaged in future self-roleplay in a virtual reality environment. The researchers found that participants' connectedness, similarity, vividness, and liking of their future selves increased following this interaction. Other researchers have shown that FSC can be strengthened through mental imagery, thereby reducing procrastination (Blouin-Hudon & Pychyl, 2017), guided visualizations to enhance work effort in school (Nurra & Oyserman, 2018), and structured interviews that increase satisfaction with life and reduce deterioration after failure (Sokol & Serper, 2019a, Study 2). A recent study by Pataranutaporn et al. (2024) showed that interacting with a future self chatbot increased FSC and decreased anxiety. Lastly, writing exercises such as writing a letter to the future self (Rutchick et al., 2018, Study 2) or exchanging letters (sending and replying) with one's future self (Chishima & Wilson, 2021) can help bridge the gap between the present and future selves and increase healthy behaviors and academic delay of gratification.

Unanswered questions regarding future self-continuity

Some techniques, such as writing a letter to the future self, have been difficult to replicate (Quinten et al., 2020). Techniques that require virtual reality equipment or an interviewer may be too time-consuming and expensive to scale to a broader population. Additionally, although field studies exist (see, for example, Robalino et al., 2023), many interventions have been conducted in laboratory settings using hypothetical decisions and self-reported behavior. Many questions about FSC remain unanswered.

One example is whether FSC can be strengthened in a cost-effective and scalable way. Scalability is crucial in eHealth (Griffiths et al., 2006) and in democratizing psychological interventions (Singla et al., 2017; World Health Organization, 2024). Therefore, I aim to investigate whether an easily administered and scalable writing exercise can enhance people's FSC.

Another unanswered question is whether lab findings translate to the field and whether self-reported intentions to engage in behaviors lead to behavior change. Studies that explore whether FSC can help close the *intention-behavior gap* (Sheeran & Webb, 2016) and clarify its

mechanisms would provide valuable contributions to the field. To date, most studies on FSC have been conducted in the laboratory, using hypothetical choices or self-reports of behavior. However, many lab findings in psychology do not translate to the field (DellaVigna & Linos, 2022; Kristal & Whillans, 2020). For a long time, prominent researchers in the field have called for more field studies and observations of actual behavior, rather than lab studies and self-reports (Baumeister et al., 2007; Cialdini, 2009; Nisbett & Wilson, 1977). In the realm of trade-offs between the present and the future, there have also been calls to examine actual behavior rather than relying solely on self-reports and questionnaires (Rung & Madden, 2018). Therefore, I aim to investigate the relationships among FSC, self-reported attitudes, and objectively measured behavior.

A third set of questions concerns which variables FSC is related to, and how strong these associations are. Since the influential article by Hershfield (2011), which laid the foundation for FSC, researchers across cultures and with diverse interests have explored the construct and its associations with topics like, as noted above, health, personal finance, and meaning in life. However, the relevance of FSC remains unclear in other areas. For example, to the best of my knowledge, no studies have explored associations between FSC and political orientation or environmental attitudes. Therefore, I aim to explore how FSC is related to a broad set of variables related to values and guiding principles.

To summarize, research on FSC still faces important challenges, from questions of scalability and ecological validity to understanding how the phenomenon relates to other psychological constructs. To find answers to these questions, researchers need to conduct studies that bridge the gap between lab and everyday life. In the next section, I describe the methodological and ethical approach that guided this thesis from initial ideas, through data collection, to analysis.

Methodology

> Sometimes I feel, Feel like my time has passed, Like I'm an hourglass, And the sand is moving fast.
>
> Riff Raff

Ethical Considerations

The European Code of Conduct for Research Integrity (ALLEA, 2023) states that good research practices are based on several "fundamental principles of research integrity" to guide individual researchers and the institutions they work in, when facing challenges of an ethical nature. Among others, *honesty* in developing, undertaking, reviewing, reporting and communicating research is mentioned as one of these fundamental principles. In psychological terms, the concept of *intellectual humility* captures honesty about the limitations of one's knowledge and is believed to contribute to learning over time (see for example Porter et al., 2022). Considering that this is a PhD thesis, I want honesty about my own abilities and their limitations to permeate it. This applies to the ethical aspects, as well as the development of the studies, my analyses and conclusions.

Regarding the more direct ethical aspects of the current research project, I try to the best of my abilities to be aware that research with and on humans demands a constant anchoring in ethical principles. All empirical work reported in this thesis adheres to the BPS code of Human Research Ethics (Oates et al., 2021), the EU General Data Protection Regulation (European Union, 2016), and the Swedish Law on Ethical Review of Research Involving Humans (Svensk Författningssamling, 2003). Each study in each article has been reviewed and approved by the Swedish Ethical Review Authority[2].

Risk-benefit analysis

I conducted a risk-benefit analysis for each study. The main manipulation in Paper 1 asked participants to vividly envision their future, which

[2] Paper 1: Study 1–2, Dnr 2022-04530-01, Study 3, Dnr 2024-00853-02, and Study 4, Dnr 2025-04409-02; Paper 2: Dnr 2024-01766-02; Paper 3: Dnr 2024-01766-02.

may be uncomfortable if those scenarios conflict with current behavior. Schubert et al. (2020) found that imagining future scenarios causes stronger affective responses than recalling past ones. Typically, future scenarios are more positive (Barsics et al., 2016). If some participants experienced negative emotions during the writing exercise, it could possibly engage them in long-term goals and lead to positive effects such as better value alignment (Vohs et al., 2019). To address potential distress, the consent form and surveys included a contact email for the research team, who were ready to direct participants to local support resources.

In the observational studies linking survey responses to transaction data, the main risk is re-identification. A theoretical "reverse-engineering" attempt could match detailed purchase patterns with specific individuals (Mittelstadt & Floridi, 2016). To make this scenario unlikely, data from Papers 2 and 3 will be shared only upon request from academic researchers.

Informed consent and right to withdraw

Participants were recruited from either a national registry of single-adult households or the recruitment service Prolific Academic, which already emphasizes informed consent and voluntary participation in its workflow (Peer et al., 2017). In the information about the studies, I explicitly mentioned that participation was optional and that respondents could exit at any point without penalty. Contact details were provided in the surveys, ensuring a direct channel for questions or concerns.

No study targeted clinically vulnerable populations. If a respondent had reported significant distress, they would have been given helpline numbers and encouraged to seek professional follow-up.

Data security and GDPR compliance

In Prolific, any personal identifiers are replaced with alphanumeric codes. All datasets reside on an encrypted server. Because reproducibility is a cornerstone of contemporary psychological science (Munafò et al., 2017), I deposit materials and analysis syntax for all three papers on the Open Science Framework, along with the de-identified data

from the experiments in Paper 1. The transaction and survey data underlying Papers 2 and 3 are held in a secure research environment and are not deposited online. As described above, they are made available to qualified researchers on request. This "safe-data" approach satisfies GDPR's requirements for scientific processing while honoring the scientific community's need for transparency.

Deception and Debriefing

Two experiments in Paper 1 (Studies 3 and 4) presented participants with exaggerated claims about the stability of personal identity over time. One group was told that identity is highly stable, while the other was told that it changes dramatically, even though current evidence lies somewhere in between. Such deception was methodologically necessary to implement the manipulation-of-mediator design (Pirlott & MacKinnon, 2016) and to examine how FSC mediated the relationship between the writing exercise, intertemporal choice and valued living. Consistent with best practice (Hertwig & Ortmann, 2008), the information was superficially plausible and emotionally neutral, did not inflict lasting harm, and a complete debrief followed immediately after the final measure. The debrief explained the true state of the literature, clarified why the manipulation was required, and reminded the participants that they had the right to withdraw their data if they felt misled.

In summary, I try to achieve high scientific and societal benefits while minimizing risks for participants. By implementing informed consent procedures, GDPR-compliant data management, and independent ethical review, I adhere to current standards for responsible psychological research and, at the same time, contribute to the broader movement toward reliable, reproducible science.

Methodological Approach

Psychology employs a wide range of methods, varying in duration and number of participants, from qualitative case studies with a single interview to meta-syntheses of longitudinal studies involving millions of participants over many years. A researcher must consider several aspects and constraints when choosing research methods. These include, but are not limited to, the research question, available time, collaborations, budget, and limitations of knowledge. Selecting an appropriate

method ultimately comes down to matching design to purpose (Shadish et al., 2002). In this thesis, my overarching goal has been to combine experimental precision for testing causal mechanisms with the ecological validity required to understand how psychological constructs operate in everyday life outside the (digital) laboratory. Each methodological choice has therefore reflected a balance between internal and external validity.

Experimental methods, such as those used in Paper 1, enable causal inference by systematically varying one variable while holding all others constant. This approach allows us not only to determine whether a manipulation affects FSC but also to better understand how and when these effects occur. However, experiments alone often fail to capture the complexity of human behavior in real-world settings. To address this, observational and field-based studies (Papers 2 and 3) are included to explore whether the psychological constructs are evident in real-world decisions and measurable consumer actions.

Another guiding principle has been the integration of subjective and objective data. Self-reports provide insight into internal states, such as beliefs, attitudes, and intentions, but are vulnerable to biases, including self-presentation, social desirability, and memory distortion (Cerri et al., 2019; Nisbett & Wilson, 1977; Prince et al., 2020). Objective indicators, such as transaction records and behavioral logs, serve as a counterweight by grounding psychological constructs in observable actions. By combining self-reported and behavioral measures, I aim to strengthen both construct validity and generalizability, enabling a richer understanding of how perceptions of the future self can translate into real-world choices.

Finally, this approach aligns with a broader trend in psychological science toward collecting cumulative, replicable evidence (Korbmacher et al., 2023). By combining controlled experiments with large-scale observational data and testing theoretical assumptions across diverse contexts, I aim to produce findings that are not only internally valid but also externally reliable, yielding at least some insights that can complement the field of research and extend beyond the laboratory to real-world settings. In other words, I pursue *generalizability*.

Generalizability

A central goal of psychology is to broaden knowledge beyond the individuals, stimuli, and situations in which the findings were initially observed. In other words, it aims for generalizability. However, there is increasing concern that much of the psychological knowledge base rests on narrow, unrepresentative samples, simplified operationalizations of psychological constructs, and experimental paradigms that limit the applicability of research findings to other contexts and circumstances (Bauer, 2023). Tal Yarkoni (2022) describes the current situation as a *generalizability crisis*, in which researchers routinely draw far-reaching verbal conclusions, whereas statistical models allow only inferences within narrow bounds. The problem worsens because variables that researchers want to generalize beyond, such as stimuli, tasks, lab environments, or the researchers themselves, are rarely understood as random factors. This leads to overconfidence in results and increases the risk that entire areas of the literature are filled with findings that cannot be generalized to other contexts.

The *Theory of Generalizability* (Cronbach, 1975; Cronbach et al., 1963) provides a method for establishing clear boundaries for accepting study results. In that way, researchers can identify limitations and systematically test the boundary conditions for their conclusions. Examples of research that have achieved a high level of generalizability include the "Many Labs" projects (Klein et al., 2014) or intervention tournaments (as seen in Vlasceanu et al., 2024), which test effects across diverse populations, contexts, and research environments, and the current trend of "mega-studies" (Duckworth & Milkman, 2022). Achieving generalizability, therefore, requires not only large and varied samples, but also a research culture that systematically asks: for whom and under what circumstances do our results apply? By reporting limitations and by designing studies that reflect the complexity that characterizes human behavior, psychology can gradually build a more robust and applicable science (Bauer, 2023; Yarkoni, 2022).

However, a PhD project has clear time and budget constraints that limit my ability to conduct the studies I would prefer. Therefore, I aim to clearly identify the limitations of generalizability so that peer researchers and other interested readers (if any) can draw accurate conclusions

without exaggerating or embellishing the results. One step toward achieving this is to aim for careful research practices.

From questionable to careful research practices

If psychology at the start of the 21st century were to be given an epithet, some scholars would call it a "crisis of confidence" (Pashler & Wagenmakers, 2012), while others call it a "credibility revolution" (Vazire, 2018). What is clear is that some aspects and consequences of research practices in scientific psychology have been overlooked, and the field is now transitioning from "questionable research practices" (QRPs) to more carefully considered ones. Three major limitations of psychological science became apparent.

First, cases of scientific fraud, such as social psychologist Diederik Stapel's large-scale data fabrication, drew attention to misconduct and earned him the label "the biggest con man in academic science" (Bhattacharjee, 2013). Subsequent investigations revealed additional cases of data fabrication and plagiarism (Lewis-Kraus, 2023; Wade, 2010).

Second, several authors criticized QRPs (Ioannidis, 2005; Kerr, 1998; Simmons et al., 2011). Widely used methods contributed to a "false positives-psychology." For example, low-powered studies with a high proportion of false positives among significant findings (Vankelecom et al., 2025), null hypothesis significance testing (NHST) with an arbitrary $p < .05$ threshold, hypothesizing after the results are known (HARKing), and a publication culture that prioritizes novelty and productivity over robustness and quality.

Third, efforts to replicate influential findings revealed poor replicability. The Open Science Collaboration (2015) attempted to replicate 100 studies and found that 36% produced significant results, usually with smaller effect sizes. Similarly, Camerer et al. (2018) tried to replicate 21 papers and did so successfully for 62% of the original results.
Together, these issues have fueled debates on how to improve psychological science. Many researchers, supported by empirical studies, now call for greater *reproducibility*, *robustness*, and *replicability* (Nosek et al., 2022).

Reproducibility

One foundation of scientific research is that studies and analyses should be reproducible: using the same data and methods should yield the same or similar results. Yet, in an analysis of over 250,000 p-values in eight major psychology journals from 1985 to 2013, Nuijten et al. (2016) found that half of all psychology papers using NHST reported at least one p-value inconsistent with the corresponding test statistic and degrees of freedom. And in a recent investigation of reproducibility in a stratified random sample of 600 papers published between 2009 and 2018, only 53.6% of the datasets were precisely reproducible (Miske et al., 2026). Such problems undermine the credibility of research findings. One way to reduce such failures in reproducibility is to share all data and analysis code openly (Kidwell et al., 2016).

Robustness

Research findings depend heavily on subjective choices, such as data exclusion and control variables. For example, 29 analysis teams received the same dataset and produced varied results: 69% found a significant positive effect, 31% did not (Silberzahn et al., 2018). Although fragile results are not necessarily wrong, they are less robust and vulnerable to p-hacking and overfitting. One way to increase robustness is to complement NHST with Bayesian hypothesis testing (Kruschke, 2013). Another is to limit researchers' degrees of freedom by pre-registering hypotheses, methods, and analyses, thereby improving robustness by reducing arbitrary choices in analysis (Van't Veer & Giner-Sorolla, 2016). A third way is to complement theory-driven data exploration with computational discovery (Bartlett et al., 2023).

Replicability

Replicability is a fundamental but complex element of the scientific method and credibility. Essentially, it involves testing a finding's validity by collecting new data and, using the same methodology, checking whether the same result is obtained (Nosek et al., 2022). Tyner et al. (2026) attempted high-powered replications of 274 claims of positive results published between 2009 and 2018, using the original materials and peer-reviewing all studies in advance using a standardized internal protocol. Still, they could replicate only 55.1% of the original claims. Since participants and context often vary from one study to another, no

study can be perfectly replicated. Thus, researchers must compare the original research and the replication to determine whether these differences affect the validity of the findings. In this way, each replication also assesses the generalizability of a result across different contexts (Nosek & Errington, 2020). Replicability can be investigated in various ways, such as significance testing with outcomes in the same direction as the original, confidence or prediction intervals, or Bayesian analyses that compare the probabilities for different hypotheses (Etz & Vandekerckhove, 2016).

In summary, psychology is transitioning towards more transparent and robust research, thereby limiting the possibility that researchers (with or without awareness) engage in QRPs. In this thesis, I try to be a part of this transition to the best of my abilities by:

- Prioritizing direct and conceptual replication, by letting each subsequent study replicate the previous one, across all four studies in Paper 1.
- Conducting power analyses prior to data collection in all studies in Paper 1, to yield a sample large enough for statistical inference.
- Combining NHST with Bayesian hypothesis testing in the experimental studies in Paper 1.
- Pre-registering the experimental designs and analysis plans in Paper 1, as well as hypotheses and analysis plan in Paper 2, prior to data collection and/or analysis[3].
- Exploring associations between variables with both a theory-driven approach (Paper 2) and a computational discovery approach (Paper 3).

[3] All experimental designs and hypotheses were pre-registered before *analysis* in Studies 1 and 2 of Paper 1, and before *data collection* in Studies 3 and 4 of Paper 1, and in Paper 2.

- Sharing all analysis code and materials for all three papers, and all data for Paper 1, as projects in the Open Science Framework repository (https://osf.io/unkm8/). Data for Papers 2 and 3 are available on request since confidentiality regulations preclude open deposit.

The commitments listed above are easier to state than to meet in full. A thesis that argues for constraining researcher degrees of freedom should also report where its own analyses fell short, and what follows for the interpretation of the results. Some of this is reported in full in the papers, but to give two examples from Paper 2: I deviated from the pre-registered analysis plan by adding total income as a covariate in the statistical model, and the outlier criteria were not pre-specified and thus open to researcher degrees of freedom and subjective choices during the analysis process. These, and other features of the process, are documented in the paper and analysis code.

With that said, the methodological foundation for my research is in place, along with an account of where it is weakest. It is time to proceed to the studies and their results.

Results

> I ain't happy, I'm feelin glad, I've got sunshine in a bag, I'm useless, but not for long; The future is coming on
>
> Gorillaz

Here, I summarize the papers included in this thesis, focusing on their conceptual, methodological, and empirical aspects. All three papers address the common topic of FSC, exploring different aspects of the strength, distribution, mechanisms, and effects of a strong or weak connection to the future self. Table 1 also summarizes the three papers, including their journal outlets, samples, methodologies, key variables, and main empirical findings. The following section provides an overview of each paper's main conclusions.

Paper 1

The first paper introduces the *Day Preconstruction Method* (DPM), a novel writing-based intervention designed to strengthen individuals' connection to their future selves. Drawing inspiration from the *Day Reconstruction Method* (Kahneman et al., 2004), the DPM reverses its temporal direction by inviting participants to pre-construct a day in their imagined future, rather than reconstruct a day in the past. Across four pre-registered experiments (N = 1,624), participants either described a day in the distant future (experimental group), or a day in the near future, or the present day (control groups), after which their FSC was measured with validated questionnaires.

The first study demonstrated that describing a distant-future day in text resulted in significantly higher self-reported FSC than describing a near-future day, with large effect sizes and strong Bayesian support for the alternative hypothesis. Study 2 confirmed these results and explored moderating variables. It showed that higher subjective negative affect was a significant moderator, thus weakening the impact of the DPM, while verbal concreteness and positive affect did not act as moderators. However, positive affect was a significant predictor of higher FSC levels.

Studies 3 and 4 expanded this research by investigating whether the DPM affected economic and value-based decisions. Although there

were no effects on intertemporal choice, measured either through a real economic decision or a hybrid delay discounting task with the chance to win one of the options, both studies confirmed that the DPM consistently increased FSC. In the final longitudinal experiment, participants who pre-constructed the distant future reported a greater extent of valued living one week later compared to the control groups, an effect partially mediated by FSC. However, the level of significance was not particularly strong (p = .012), and Bayesian hypothesis testing revealed inconclusive evidence (BF_{10} = 0.96) for either hypothesis.

Overall, these findings establish the DPM as a scalable, low-cost intervention that reliably enhances individuals' connection to their future selves. While its impact on economic decision-making remains limited, the DPM shows some initial potential to foster psychological alignment between current actions and long-term values.

Paper 2

The second paper explores whether one sub-component of FSC, vividness, is linked to consumer attitudes and sustainable and healthy consumption, and savings. Using a large-scale dataset that linked survey responses to debit-card transaction records, the study combined self-reported attitudes with objectively recorded consumption. The sample consisted of 4,366 Swedish single-adult households (3,544 were included in the analysis) that, by downloading a CO_2-tracking app and sharing their data, showed an interest in pro-environmental behavior and consumption-related CO_2 emissions. The behavioral outcomes were totals over each participant's available transaction history, with most participants providing more than one year of consumption data rather than a uniform window, a feature discussed in the paper's limitations. Analysis of pre-registered hypotheses using Structural Equation Modeling (SEM) showed that regarding sustainable attitudes and behaviors, vividness was positively associated with environmentally friendly attitudes, as predicted, but also with higher consumption-related CO_2 emissions, contrary to the hypothesis. Regarding thriftiness, vividness was positively associated with long-term economic attitudes but not with actual savings. Vividness was also significantly and positively associated with health-related consumption. However, it was not associated with a sense of personal responsibility.

Two of the pre-registered hypotheses, that age and socioeconomic status moderate the association between vividness and consumption behavior, were addressed only in part at the time of writing this thesis. Paper 2 notes this limitation, and I intend to test the full set of paths in a revised model.

In addition to the pre-registered hypotheses, the analysis also revealed several exploratory findings worth mentioning. Pro-environmental attitudes were associated with lower consumption-related CO_2 emissions, while long-term economic attitudes were associated with both savings and lower consumption-related CO_2 emissions. The association between long-term economic attitudes and CO_2 emissions was of a similar magnitude than that between pro-environmental attitudes and CO_2 emissions. This indicates that attitudes can be associated with behavior in consumer decision-making, although with small effect sizes, which is interesting in relation to the attitude-behavior gap (Kollmuss & Agyeman, 2002). Also, for practitioners, it can be useful to understand that one route to influence consumption-related CO_2 emissions might be to appeal to thriftiness and financial prudence as well as sustainability.

Income was more strongly associated with all three behavioral outcomes than any psychological variable in the model. For example, the standardized coefficient for total income was .574 against .075 for vividness for CO_2 emissions, and a similar ordering held for health-related spending and savings. However, one must be aware that the data only support the conclusion that adding future self-vividness to a model of observed consumption changes little, and this study is not a direct comparison of psychological and economic determinants.

Overall, Paper 2 deepens understanding of the psychological underpinnings of long-term consumption by combining large-scale subjective and objective data. It also shows that vividness has a small yet significant association with some consumer attitudes. However, the small effect sizes suggest that the direct impact on actual consumer behavior across broad categories of health and savings remains limited.

Table 1 – Summary and main findings of the three papers included in the thesis

Paper	Sample	Study Type	Key Variables	Main Findings
Paper 1 Published in *Journal of Experimental Psychology: Applied*	Study 1: n = 500 Study 2: n = 492 Study 3: n = 352 Study 4: n = 280 All subjects were recruited on Prolific.	Study 1: Between-subjects Randomized Controlled Trial (RCT). Study 2: Between-subjects RCT. Study 3: Between-subjects 2 x 2 RCT with manipulation-of-mediator design. Study 4: Longitudinal 3 x 2 RCT with manipulation-of-mediator design. All studies were pre-registered.	Study 1: FSC, two validated questionnaires. Study 2: FSC, affect, and concreteness. Study 3: FSC, subjective positive/negative affect, intertemporal choice task. Study 4: FSC, delay discounting task, self-reported valued living.	Participants who imagined a distant future day reported significantly higher FSC than control groups. The effect replicated across all four studies. Little or no effect on monetary intertemporal choice (Studies 3 and 4). Bayesian analyses providing moderate support for the null. Experimental group reported greater valued living one week later, partially mediated by FSC, with inconclusive evidence (p = .012, BF_{10} = 0.96).
Paper 2 In preparation for submission to *Journal of Environmental Psychology*	Swedish adults living in single-adult households, recruited from a national registry via digital mail. 11,055 completed the survey; 4,366 could be matched across survey responses, transaction data, income, and registry data. n = 3,544 in the structural model.	Observational study linking self-reports to debit-card transaction data, analyzed with structural equation modeling. Pre-registered study, but with some deviations from the pre-registration plan.	Predictor: future self-vividness (three FSCQ items). Attitudinal outcomes: environmentally friendly attitudes, personal responsibility, long-term economic attitudes. Behavioral outcomes: CO_2 emissions estimated from categorized spending, health-related spending, savings. Covariates: gender and total income.	Vividness was positively associated with environmentally friendly attitudes (β = .069) and long-term economic attitudes (β = .104), but not with personal responsibility. Vividness was positively associated with CO_2 emissions (β = .075) and health-related spending (β = .046) but no detectable association with savings (β = −.008). Attitudes were associated with the corresponding behaviors with small effect sizes. Income was more strongly associated with all three behavioral outcomes than any psychological variable in the model.
Paper 3 Submitted to *Judgment and Decision Making*	N = 1,040 Swedish adults, a random sample of participants from the same data collection as Paper 2 and restricted by the inclusion criteria described in the paper.	Observational study linking survey responses to transaction data, analyzed with linear regression and random forest modeling with SHAP values. Exploratory, not pre-registered.	Outcome: future self-vividness (three FSCQ items). Predictors: demographic variables from registry data, income, self-report items on values, guiding principles, and political orientation, and category-level spending variables.	Vividness was positively associated with age. The bivariate association with income was weak and did not persist once age was included. Vividness was associated with two psychographic dimensions, pro-environmentalism and political conservatism. No association was detected between vividness and any recorded consumption category or with savings.

Paper 3

The third paper attempts to complement the widely used regression approach, which, because of the high degree of researcher freedom, can distort results when analyzing datasets with many variables (Harrell, 2015). This is achieved through a data-driven approach with fewer subjective choices. In the paper, I analyzed a sample of 1,040 participants drawn from the same data collection as Paper 2 but selected differently. Paper 3 a random sample and applied inclusion criteria requiring twelve consecutive months of well-categorized transactions and recorded income in each month. The two papers therefore analyze overlapping but distinct samples. While Paper 2 examined how vividness was associated with theory-driven attitudes and broad consumption categories, Paper 3 examined the predictive value of self-report items and narrow consumption categories for vividness. I first analyzed how future self-vividness was associated with demographic and psychographic variables and then used random forest modeling with SHAP values, a methodological approach suited to exploratory research with many candidate variables that limits the researcher's subjective choices in model development, to understand predictors of vividness.

First, vividness was positively associated with age, although the pattern was not strictly linear. It was lowest among participants in their late twenties and early thirties and highest among the oldest. The bivariate association with income pointed in the same direction as findings in an American study on the distribution and correlates of FSC (Hershfield et al., 2025), but it was weak and did not persist once age was included in the model. Paper 3 therefore treats it as compatible with that finding rather than as a replication of it. Vividness was not associated with education.

Second, a random forest model identified the self-report items most predictive of vividness. An exploratory factor analysis of those items yielded two well-defined dimensions, pro-environmentalism and political conservatism. The associations with vividness were positive but small. The association between future self-vividness and political attitudes is, to the best of my knowledge, novel.

Paper 3 complements traditional methods for exploring large sets of attitude and behavioral data, such as stepwise regression, by exemplifying what random forest modeling can and cannot recover in data of this kind. The findings raise questions about the associations between FSC and political attitudes, and give additional indications that vividness is more strongly associated with self-reported attitudes than with consumer behaviors.

Synthesis of findings

The three papers deepen our understanding of how people connect with their future selves and the implications of this connection, drawing on conceptual, experimental, and behavioral perspectives. Each paper explores unanswered questions about the continuity and vividness of the future self, namely how these can be strengthened and how they are associated with self-reported attitudes and real-world decisions.

Across the studies, a pattern emerges: people's relationship with their future selves can be made more vivid, emotionally rich, and psychologically continuous. That stronger connection was not accompanied by corresponding changes in the economic behaviors measured here. The only outcome that changed with it was valued living, and that result was inconclusive, which is why it is worth exploring further.

General Discussion

> So what went wrong? It was a lie, it crumbled apart; Ghost figures of past, present, future haunting the heart
>
> Belle and Sebastian

At the beginning of this thesis, I asked if a stronger connection to the future self could shift priorities from short-term gains to long-term benefits in several domains, such as sustainability, health, and personal finance. The findings from the three papers indicate that FSC, at least as I operationalized and tested it, is not a breathtaking solution that can suddenly solve the future-related challenges of human societies. Nonetheless, FSC is a construct relevant to psychological theory, has practical applications (albeit with limitations), and, most of all, warrants further research.

Theoretical Contributions

Building on Parfit's (1971, 1984) philosophical foundation of psychological connectedness between many possible temporal selves and Hershfield's (2011) conceptualization of FSC, this thesis contributes to the understanding that the perceived connection to the future self is not fixed but can be strengthened through a writing intervention and that this strengthening may be affected by subjective emotional valence.

Through the four studies in Paper 1, the findings imply that FSC is not a static trait but a malleable psychological state. The DPM demonstrates that a writing intervention can reliably enhance FSC. By inviting participants to narratively "preconstruct" a future day, the DPM uses Parfit's philosophical idea of linking the present and the future self through psychological connectedness, to create a testable psychological mechanism. The thesis thereby contributes to the theoretical understanding of personal identity as a narrative process, one that emerges through language, emotion, and self-reflection (McAdams, 2011). This concept of narrative identity, operationalized as narrative accounts of life challenges, has been shown to be associated with both well-being and depression, even after accounting for stable personality traits, in longitudinal studies (Lind et al., 2024). While previous research on narrative identity interventions has mostly focused on episodic

memories (for a review, see Adler et al., 2016), Paper 1 suggests that *episodic future thinking* may also be valuable in constructing one's narrative identity, related not only to FSC but also to the larger concept of global self-continuity (Sedikides et al., 2023).

The thesis also contributes to the discussion about future-oriented mental time travel raised by Dere (2026), who points out prominent interindividual differences in ability and in the occurrence of mental time travel, and explains how positive or negative self-reinforcement drives these differences. Since most people do not typically engage in mental time travel to the distant future (Baumeister et al., 2020; see also Beaty et al., 2019), the DPM may be understood as an enabler of directed verbal self-reinforcement that increases willingness to engage in the behavior of future mental time travel. Following Dere's discussion, positive verbal self-reinforcement ought to increase the likelihood that the behavior, the actual meeting with the future self, occurs again and more frequently.

The thesis also examines the conceptual difference between continuity and vividness, two aspects of the future self. While FSC refers to the perceived link between one's current and future identity (Hershfield, 2011), its subcomponent, vividness, plays a cognitive and affective role in the sensory and emotional richness of that future self (Morton & MacLeod, 2023). Paper 2 shows that future self-vividness is associated with attitudinal variables, and that its associations with the behavioral outcomes are small. Paper 3 points in the same direction but carries less evidential weight. No association was detected between vividness and any recorded narrow consumption category. However, sixteen of the spending categories showed no variance in the analyzed sample, and savings were recorded for only a minority of participants. That null therefore marks a limit on what these data can detect rather than establishing that no association exists. The results are consistent with theoretical models of behavior (Michie et al., 2011), in which a psychological construct is one contributor among several rather than a standalone sufficient condition. One possibility which these data cannot test is that, under the right circumstances, vividness may contribute indirectly to future-oriented behavior rather than directly causing it, for example as a mechanism that contributes to reflective motivation

or to the development of psychological capability, necessary components of behavior. This could clarify the role and position of vividness in behavior change theories.

Additionally, by integrating insights from self-regulation and behavioral economics, the thesis expands the knowledge about FSC within the broader context of self-control failure presented by Duckworth et al. (2018). Consistent with the idea that self-control failures often stem from a lack of identification with one's future self (Bartels & Urminsky, 2011), the findings in this thesis suggest that self-continuity functions as an identity-based mechanism that can support change in a valued direction. Although future self-vividness had a small positive association with healthy consumption in Paper 2, it did not show a corresponding association with savings. Nor did a strengthened future self-continuity result in changes in intertemporal choice or delay discounting in Paper 1. The two relevant results differ in what they can support. In Paper 1, strengthening FSC experimentally left monetary intertemporal choice unchanged, and Bayesian analyses provided moderate support for the null, which is evidence for the absence of an effect of the size the design was powered to detect. In Papers 2 and 3, no association between vividness and observed savings was detected, but the measurement properties bound the size of any such association rather than ruling one out, so the absence of evidence in Papers 2 and 3 should not be taken as evidence of absence. In other words, just because the studies could not report an effect, we should not rule out the possibility that there is an effect we have not yet measured.

Finally, the thesis contributes to theoretical discussions about the boundary conditions of temporal-self interventions. The findings that the effect of an FSC intervention can be moderated by subjective negative affect (Paper 1, Study 2) and that positive affect can be a significant predictor of the outcome (Paper 1, Studies 2 and 3), align with Hershfield's (2011) theorized assumption that a future self that is perceived as positive, vivid, and similar to the present self is associated with a strong FSC. And, while earlier work has focused on methods with diverse sensory input (e.g., rendered images or VR simulations, see Ganschow et al., 2021; Hershfield et al., 2011), the DPM demonstrates that narrative reflection alone can evoke similar psychological effects. This

strengthens theories positing that mental time travel and episodic prospection are grounded in the same cognitive systems that support autobiographical memory, which can be accessed through language (Schacter et al., 2017). It underscores that the future self can be made experientially real through symbolic and linguistic means, expanding the theoretical scope for how temporal identity can be shaped and studied.

To summarize, I hope my thesis expands understanding of future-self concepts by describing examples of how merely verbal descriptions of a distant future day can enhance future self-continuity, and by providing further evidence that FSC is a malleable construct that can be strengthened with brief interventions. I also hope that the thesis brings further understanding and ideas for future research by describing FSC in relation to consumer attitudes and behavior.

Methodological Contributions

My thesis can also advance methodological practices in scientific psychology to some extent by addressing recent challenges in the field: limited generalizability, overreliance on self-report measures, and transparency issues in research. The consistent use of open science practices, diverse methods such as experimental manipulations and large-scale observations, subjective and objective measures, and both theory-driven and computationally driven exploratory analyses yields a more comprehensive and reliable understanding of the findings than research using fewer methods and measures.

First, the thesis demonstrates how combining experimental and observational methods can balance internal and external validity. Paper 1 uses randomized controlled experimental designs to establish causal relationships between a psychological manipulation, the DPM, and its effects on FSC, economic decisions, and valued living. Paper 2 and Paper 3 aimed to extend these insights to real-world settings by connecting psychological constructs to consumption data, using both theory-driven and data-driven analytical approaches. This multi-method approach addresses calls in psychology to go beyond isolated laboratory findings and incorporate behavioral evidence from everyday life (Baumeister et al., 2007; Cialdini, 2009).

Second, in all three papers, I combine subjective and objective measures. While self-reports reflect the internal, phenomenological aspect of how people think and feel about their future selves, objective indicators such as debit-card transactions or linguistic markers in writing anchor those constructs to behavior. Combining the two allows each link to be estimated separately. First, between temporal identity and the attitudes that precede a behavior, and second, between those attitudes and the spending or saving that follow them.

Third, the research enhances the credibility and cumulative progress of psychological science by following open-science principles, and by being explicit about where those principles could be applied in full and where they could not. The experiments in Paper 1 can be reproduced directly from the deposited materials and data. For Papers 2 and 3, the analytic workflow is documented in full, and the data are available on request, so reproduction is possible but requires an application to the data holder. The four experiments in Paper 1 and the hypotheses and analysis plan for Paper 2 were pre-registered. Paper 3 was not and is therefore presented as entirely exploratory. Analysis code, output, and study materials for all three papers are openly available on the Open Science Framework, as are the data for Paper 1. The transaction and survey data for Papers 2 and 3 are held in a secure research environment under confidentiality regulations and cannot be deposited openly but can be made available to qualified researchers on request. Pre-registration and open code reduce researcher degrees of freedom and lower the risks of p-hacking and overfitting (Silberzahn et al., 2018; Van't Veer & Giner-Sorolla, 2016) and contribute to the ongoing attempts to make psychological science more reproducible and robust (Munafò et al., 2017; Nosek et al., 2022).

In summary, the methodological contributions of this thesis are its integrative approach where I combine laboratory and field research, subjective and objective measures, and aim to let each individual study build on another in a cumulative progress.

Practical Contributions

I also hope this thesis offers practical implications for interventions, policy, and psychology. The results demonstrate how the psychological

connection to the future self can be strengthened and highlight the conditions under which this connection may influence behavior.

First, the DPM introduced in Paper 1 offers a simple, easy-to-administer, and low-cost tool for strengthening FSC. Compared to earlier interventions that rely on virtual reality, therapist-led exercises, or technological feedback systems (e.g., Hershfield et al., 2011; Pataranutaporn et al., 2024; Sokol & Serper, 2019a), the DPM can be delivered digitally or in written form without specialized equipment or training. This can make it suitable for future use in schools, workplaces, and digital health platforms. For instance, it could be integrated into health or coaching apps to promote long-term adherence to goals, compliance, or sustainable lifestyle choices. In therapy or educational settings, it could serve as a structured reflective exercise to clarify personally meaningful values and align daily actions with them. However, it is important to point out that research on the DPM is still very limited, and independent research groups should conduct studies on the effect and boundaries of the method, before it is eventually used in practice.

Paper 2 shows that while the vividness of the future self is associated with some pro-environmental attitudes, these attitudes may be weakly associated with behaviors. This insight is important for designing behavioral and policy interventions. However, the finding that long-term economic attitudes were associated with lower consumption-related CO_2 emissions of a similar magnitude as environmentally friendly attitudes is worth noting, especially given that the sample included many individuals interested in pro-environmental consumption. This might have implications for climate change communication. Practitioners and communicators can try to amplify a sense of thriftiness to shift individuals' consumption-related CO_2 footprint. In areas such as public health, financial planning, and climate communication, highlighting vivid, personalized connections to one's future self might increase engagement with long-term outcomes (see, for example, Robalino et al., 2023, for a field study on retirement savings). Framing messages to make the distant future emotionally and cognitively tangible by, for example, helping people visualize the lives they want or the person they might become, can help close the motivational gap that can hinder action. However, relying solely on psychological framing or imagination-

based techniques may have a small and uncertain effect. Building on the findings from Paper 2, psychological intervention combined with structural supports, such as economic incentives and policies, may make the future self more actionable rather than merely imaginable and preferable. In this way, the results align with research on self-control (Duckworth et al., 2018) and the design of behavior change interventions (Michie et al., 2011), which emphasize that lasting change requires both internal motivation and external scaffolding.

A novel yet preliminary finding is the positive association between future self-vividness and political conservatism, operationalized as placement further to the right on a left–right scale and lower perceived seriousness of social inequality and climate change, as revealed in Paper 3. Previous research has examined, for example, the connection between future self-relatedness and moral judgments (Simić et al., 2025) and the effect of nostalgia (described as related to past-to-present continuity) on populist radical right parties in the Netherlands (Smeekes et al., 2021). The finding that a more vivid perception of the future self was associated with political conservatism might be of interest for political communication when framing messages towards different groups of voters.

Taken together, the practical contributions of this thesis lie in showing what a scalable future-self intervention can accomplish and in identifying where its effects were not found. The DPM reliably strengthened the connection to the future self, and vividness was associated with future-oriented attitudes, yet neither the DPM nor vividness was accompanied by a corresponding change in the economic behaviors measured here. The thesis did not vary the conditions under which such interventions might work, so it identifies where the effects stop in these designs rather than establishing boundary conditions. Determining those conditions, for example, which structural, social, and contextual incentives are needed for attitude to become action, is a task for future research.

Limitations

All studies in this thesis have limitations that should be kept in mind when interpreting the findings. These limitations concern issues of

design, measurement, generalizability, and temporal scope. However, they also point toward productive directions for future research.

First, the experimental studies in Paper 1 provide evidence of internal validity and causal inference regarding FSC, but they rely primarily on self-reported measures. The DPM consistently increased participants' perceived connection to their future selves. However, it remains unclear how long these effects last and to what extent they lead to sustained behavioral change. The longitudinal Study 4 was limited to one week, and future research should examine whether repeated use of the DPM, or "booster sessions," produces more durable effects on real-world behavior.

Second, Paper 2 uses an observational design, which precludes causal inference. The links between vividness and sustainable or financially responsible actions are correlational, and unobserved variables such as personality traits, cognitive skills, or economic situation beyond income may account for them. Transaction data reduce self-report bias, but they are high-dimensional and not straightforward to interpret in psychological terms. Income was more strongly associated with all three behavioral outcomes than any psychological variable in the model. However, income and the outcome measures are sums over the same observation window, while the CO_2 estimate was derived from spending by applying emission intensities, and vividness was assessed with three self-report items. The differences between the measures imply that they should not be interpreted as a ranking of structural versus psychological influences.

Third, both Papers 2 and 3 analyze savings as recorded in transaction data, and neither detects an association with vividness. The two results differ in what they can support. In Paper 2, savings are summed over an observation window of varying length, which weakens the estimate. In Paper 3, the exported savings variable was non-zero for only 34 of the 1,040 participants, too few to support an inference about saving behavior. Both are therefore bounds rather than evidence of absence and should be read as such alongside the positive findings reported elsewhere in the literature (Ersner-Hershfield, Garton, et al., 2009). A further consideration is that Sweden's pension system differs substantially

from, for example, the American system: a large share of retirement saving occurs automatically, so the need for discretionary personal saving is lower than in many other countries. How the behavioral manifestations of FSC differ between countries remains an open question, though previous research on self-continuity across cultures has shown some cultural moderation in how it is constructed (Becker et al., 2018).

Fourth, the samples used in all papers have limitations in their ability to represent the broader population. The experimental studies relied on online samples recruited through Prolific, which are more diverse than traditional student samples but still tend to consist of younger participants (although it is worth noting that participants' ages ranged from 18 to 79 years, and they came from over 20 countries). The consumption datasets in Papers 2 and 3 are limited to single-adult households for stronger internal validity. However, these households may differ systematically from multi-person households in spending habits, vividness, and time perspectives. Also, participating in a study by downloading an app and connecting one's debit card demands a high level of trust in the researchers and technology, and some interest in the link between consumption and sustainability[4], further limiting the diversity of the sample. These factors limit the generalizability of the findings, which future research should address.

Fifth, all three papers focus on individual cognition and behavior without fully considering the social and cultural contexts in which future self-related processes happen. Decisions about saving, sustainability, or health are shaped by social norms and policy structures that influence people's actions (see, for example, Khan et al., 2024). The current research does not include these macro-level influences.

Finally, pre-registration and open code constrain analytic flexibility but do not eliminate it. This matters most in Paper 2, where the SEM involves many specification choices, and in Paper 3, which was

[4] As an example: 26% of the participants in Paper 3 answered that they voted for the Green Party in the last election, five times more than in the official election result (Valmyndigheten, 2026).

exploratory and not pre-registered. In the future, researchers, including myself, ought to make use of more of the methods that are emerging in the open science movement, both a priori and post hoc. One promising attempt is to produce *registered reports* (see Nosek & Lakens, 2014) in which study design, analysis plan, and code are peer reviewed before data collection even begins, to minimize bias and subjectivity in the analysis. After the analyses, it is possible to be transparent with several aspects of the analytical process and how each researcher decision might skew or affect results and interpretation. For example, *multiverse analysis* (Steegen et al., 2016) and *specification curves* (Simonsohn et al., 2020) are methods to estimate how each decision node in the analytical process contributes to the results, and how they would have differed if other decisions had been made.

These limitations tell us something important. No results in this thesis should be seen as final answers or conclusions, but rather as a step in a long path towards understanding the psychological construct and its meaning, and for developing new ideas for a transparent, realistic, and in-depth knowledge of future self-continuity.

Future Directions

Research is, of course, always limited by constraints in budget, time, and possibilities. However, future research could and should build on the present findings by exploring both the temporal and contextual boundaries of the future self.

A logical next step from this thesis is to assess the durability of self-continuity interventions, such as the Day Preconstruction Method, which other researchers have also requested (Rutchick et al., 2018). Repeated or longitudinal implementations could clarify whether strengthening the perceived connection to the future self leads to sustained behavioral effects over weeks, months, or years.

Future research should also move beyond the individual level. For example, integrating population-based data with experimental field studies could clarify how personal and contextual factors jointly shape long-term decision-making and behaviors. *Collective future thinking*, as described by Kashima et al. (2025), offers a promising way to structure

and operationalize future thoughts and identity in a collective rather than individual manner. Future research should examine how collective identity can be strengthened and its effects on various aspects, such as the will to defend, collective efforts to mitigate climate change and global warming, contributions to civil society, and other major issues that require present individual sacrifices for the future collective good.

Another challenge involves ergodicity: whether patterns observed at the group level accurately represent processes within individuals over time (Molenaar & Campbell, 2009). The question of ergodicity remains surprisingly unanswered in psychological science, as many researchers assume that the constructs they examine transfer from group to individual levels, although this is not always the case (Fisher et al., 2018; Speelman et al., 2024). It is still unclear whether FSC is an ergodic construct. Researchers need to investigate whether the mechanisms that explain why some people generally feel more connected to their future selves also account for fluctuations in continuity within a person over time and across different contexts. Addressing this requires detailed longitudinal studies, such as daily or weekly assessments, to model how FSC and its components change within individuals. Clarifying whether FSC is ergodic or non-ergodic would strengthen the research's theoretical foundation and help determine whether interventions should focus on stable traits or temporary states.

Additionally, cross-cultural studies would broaden the applicability of current theories. Across cultures, people's time perspective differs (Shipp & Aeon, 2019), and it is plausible to believe that the meaning and significance of the future self can differ across various cultural backgrounds, economic systems, and perceptions of time (Becker et al., 2018). Exploring these differences would help shape a more comprehensive psychology of temporal identity, showing how humans worldwide are similar and different in how we think, feel, and behave toward our future selves.

Concluding remarks

> Past and present, they don't matter, now the future's sorted out
>
> Phoenix

When my twins, a son and a daughter, were born in February 2019, I felt more connected to these two people than I had ever felt to anyone before. This connection was emotionally strong, of course, but also temporally strong. Suddenly, my sense of time stretched from days and months to years and decades. The distant future became important, not just as an idea, but as a time and place my children would occupy. Health, sustainability, and long-term well-being took on new importance. I want to believe that everyone (not just new parents) can strengthen their connection to their future selves. And by doing so, they may benefit both themselves and others. This thesis is a way of acting on that belief.

I began with the question of how we can maintain self-control in an age of excess. How can we stay aligned with what we intend to do but often fail to do, surrounded as we are by candy, commercials, and convenience? My research suggests that one part of the answer might be to bring the future closer: by writing, reflecting, and vividly imagining who we might become, we can feel more connected to our future selves and let our present selves align with that. The studies in this thesis show that this can be done through a simple writing exercise. They also show that people who picture their future selves more vividly tend to hold more sustainable and long-term attitudes. Yet, they also serve as a humble reminder that continuity is at most a foundation, not a guarantee, for change. To act for the future, we may also need to address the emotional, contextual, and structural forces that shape our daily decisions.

If there is a practical message to take from this work, it is that caring for the future, one's own and humanity's, is not just an abstract moral ideal but a psychological capacity that can be developed. We may never fully close the gap between the present and the future, but we can reduce it by getting to know the future self. Then we can make some wiser choices today. And if we do, we might help shape a future worth living in, not only for our own future selves but also for others.

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Vivid Future, Present Decisions?

Can a short writing exercise bring you closer to the person you will be decades from now? And if it does, will you save more, live healthier, or consume more sustainably? Most people know what the future demands of them, yet still favor the present. One reason may be that the distant future self feels like a stranger. This thesis examines whether that connection, known as future self-continuity, can be strengthened. In four preregistered experiments, describing one day in the distant future reliably strengthened the connection but did not change monetary choices. There were, however, tentative signs that participants reported living more in line with their values a week later. Linking surveys to real debit-card transactions from Swedish adults revealed that people who pictured their future selves more vividly held greener, more long-term attitudes, yet their spending was not greener, and no link to saving was detected. Together, the findings show a malleable connection to the future self, consistently linked to attitudes but weakly, if at all, to economic behavior. A strong connection to the future self may be a foundation for behavior change in some, but not all, domains of life.

ISBN 978-91-7867-753-5 (print)

ISBN 978-91-7867-754-2 (pdf)

ISSN 1403-8099

DOCTORAL THESIS | Karlstad University Studies | 2026:48