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THE FUTURE SELF

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Abstract

Many decisions require making tradeoffs between the present and the future. Although a variety of perspectives have been applied to study these intertemporal trade-offs, in this chapter we will focus on research that examines how thoughts about one’s future self affect decisions with delayed consequences. To do so, we will discuss three theoretical perspectives on the future self: the future self as another, continuity between selves, and failures of imagination.

Throughout, we examine the myriad considerations that influence decisions made on behalf of the future self in many domains (including finance, health, ethical decision-making, and child development) as well as interventions that have been found to change the way that people think about the future self and potentially promote more prudent behavior. We close by proposing several questions for future research.

Whether it is the choice between spending and saving, eating a tempting desert versus maintaining one's diet, or sinning rather than acting in a less exciting but more morally upstanding way, many decisions require making tradeoffs between the present and the future. Sometimes, a choice poses short-term rewards that could have detrimental effects in the long run (e.g., that trip to Paris would be fun right now, but I will be paying it off for months), while the future-oriented option brings with it a present sacrifice but heightened well-being in the long run (e.g., staying in Cleveland isn't as fun right now, but I can have a more comfortable retirement with my extra savings). Given the serious costs that such choices can impose on both people and societies, it is perhaps not surprising that much work in behavioral science (e.g., psychology, economics, marketing, behavioral economics) is dedicated to understanding how people make these sorts of trade-offs and how decision-making in these domains can be improved.

A large body of literature has examined such tradeoffs through the lens of temporal discounting (i.e., how much people devalue delayed rewards and why; see Frederick, O'Donoghue and Loewenstein, 2003; Scholten & Read, 2010; Urminsky & Zauberman, 2016). Related lines of research examine the ways in which people fail to adequately account for the emotions that they will experience over time (affective forecasting; e.g., Wilson & Gilbert, 2005), fail to delay gratification (e.g., Metcalfe & Mischel, 1999), overweight present emotions and outcomes (e.g., Loewenstein, O'Donoghue, & Rabin, 2003), and adequately or inadequately consider and weigh properties of present and future rewards (e.g., Soman et al., 2005). Although a variety of perspectives have been applied to study these intertemporal trade-offs, in this chapter we will focus on research that examines how thoughts about one's future self affect decisions with delayed consequences. To do so, we will discuss three theoretical perspectives on the future self: the future self as another, continuity between selves, and failures of imagination. Throughout, we examine the myriad considerations that influence decisions made on behalf of the future self in many domains (including finance, health, ethical decision-making, and child development) as well as interventions that have been shown to change the way that people think about the future self and potentially promote more prudent-seeming behavior. We close by proposing several questions for future research to tackle. Although researchers have been examining the ways that people think about and treat the future self for a long while (e.g., Markus & Oyserman, 1989), we will focus here on studies conducted over the last 10 years, with occasional mentions of earlier research where necessary.

Theoretical Background

Most decisions entail delayed consequences, and as such, can pose challenging cognitive and emotional hurdles for the decision maker. To consider a few examples, decision-makers must grapple with the uncertainty of future states of the world, their comfort with various levels of risk, and an inability to fully understand how present-day decisions will affect them later on. There are also a large number of challenges that specifically involve conceptualizations of the self over time. For instance, (i) how much do we or should we care about that future self who stands to benefit or suffer from actions taken by the present self?, (ii) what is the planning horizon, and are we thinking about the future consequences of our actions at all?, (iii) can we even imagine a future self that doesn't exist (yet)?, and (iv) can we integrate our image of the future self with all these other complexities to imagine the future state that the future self will find herself in as a result of the current self's decisions?

Even decisions with relatively short time frames can be challenging for various reasons. For example, sleeping in and having 30 minutes of extra sleep, but feeling regretful later for skipping a gym class could reflect a lack of projection to the future (i.e., only thinking about the next 30 minutes of one's life and neglecting the rest of the day), an under-weighting of concern for the future self (which might or might not be justified), or an underappreciation of just how crummy we'll later feel about skipping the gym. And of course, when the choices involve much longer frames (e.g., retirement decisions), these issues are all the more challenging, with the current self sometimes completely ignoring the interests and feelings of a future self who may desire to be more physically healthy and financially secure. Most of the literature that we review in this chapter relates to the way that people deal with these challenges (with varying degrees of effectiveness).

There have been several treatments of the tension between the present and future self in a variety of literatures, with many offering (normative) prescriptions for how to best make these kinds of choices. We will briefly review this literature to frame our discussion of the last decade of research on the future self and its role in decision making.

One set of theories, mostly discussed in economics, attempts to model high-conflict choices with delayed consequences as a competition between multiple simultaneously existing selves (Alos-Ferrer & Strack, 2014; Fudenberg & Levine, 2012; O'Connor et al., 2002; Schelling, 1984; Thaler & Shefrin, 1981). Schelling (1984), for example, discusses the far-

sighted self that who places the alarm clock across the room, anticipating that tomorrow morning's myopic self will hit the snooze button. And, Elster (1977) points to the case of Ulysses, who had the sophisticated insight that his future self would possess different preferences than his current self: by having his shipmates tie him to the ship's mast, he was able to listen to the songs of the Sirens (something his current self desired), while refraining from jumping overboard to his death (something his future self would want to avoid; Homer, 1997). Within these "Multiple-Selves" models, there can be an ongoing negotiation between the current self and the future self, and "self control failures" or "failures to defer gratification" are usually attributed to the future self's less powerful status in such negotiations (Bazerman, Tenbrunsel, & Wade-Benzoni, 1998; cf. Bartels and Rips 2010).

A separate body of ideas is discussed in philosophy, where theorists have been arguing over when, why, and how much we ought to care about the future self based on determining what it means for a person to continue existing over time or go out of existence (see, e.g., Martin & Barresi, 2002). These are normative, rather than descriptive theories, describing how we ought to think about the self over time, rather than how we actually think about the self over time. This literature offers a vast diversity of perspectives, and some views argue that there is no such thing as personal identity over time (i.e., that we do not exist at all; Unger, 1979).

Another group of theories, which we term "future self as other" theories, argue that what matters is the degree to which the future self deserves resources (and thus should be awarded those resources; Brink, 1997), or that our concern for our future selves should be driven by the kinds of care that we show for our loved ones, like our children (Whiting, 1986).

Other views, which we call "continuity theories" specify what should determine our level of concern for the future self (e.g., continuity of the body; Thomson, 1997, psychological features; Parfit, 1984, consciousness; Locke, 1975).

A final grouping of group of more behaviorally-informed theories references the myriad ways in which people do not adequately project into the future or mispredict aspects of the future. This is a widely varied group of less comprehensive frameworks—usually developed to characterize one or a few such mis-projections—and we will refer to a selection of these theories when we discuss "Failures of Imagination."

Three of these approaches have been subjected to empirical examination in recent years, and as a result, we will next discuss research on (i) the future self as another, (ii) continuity

between selves over time and (iii) failures of imagination, noting some connections between them, and then discuss directions for future research.

The Future Self as Another

Theorists have suggested that the future self may *feel* like, may be treated like, or may actually be a distinctly different person from the current self (see, e.g., Parfit, 1971). Parfit (1971) considers a young boy who starts to smoke, knowing that doing so will negatively impact the health of his future self, but having no self-interested reason to care from the perspective of the current self. Others have pointed to the idea that overspending in the present and failing to save for one's future retirement might be linked to a person's view of her future self as another, different person altogether (Diamond & Koszegi, 2003).

Some research suggests that people view the future self much as they view other persons. In early work, Pronin and Ross (2006) found that research participants were more likely to take an observer's viewpoint when mentally picturing a future self (a perspective that is also taken for past selves; Libby & Eibach, 2009), but a first-person perspective when thinking about actions occurring to the present self. Participants also perceived a future self's actions in terms of that self's traits and dispositions, much the same way that observers do for others in the present. Other work has found that people are more likely to think of the future self in abstract, rather than concrete terms, like they tend to do for other people in the present (Wakslak, Nussbaum, Liberman, & Trope, 2008). Further, Ersner-Hershfield, Wimmer and Knutson (2009) found that neural activation patterns elicited by thinking about a future self in ten years' time were actually more similar to the activation patterns that result from thinking about others than to the patterns that are elicited by thinking about the self today (see also Mitchell, Schirmer, Ames, and Gilbert, 2011). A distant future self, in other words, may be viewed in ways that are similar to how we see others.

This tendency to see the future self as another can alter intertemporal decisions. If the future self really is seen as another person, then we might feel no more obligated to make sacrifices for our distant selves than we are to sacrifice for others today (Parfit, 1984). Saving money for future selves and foregoing delicious but fattening desserts today may be similar, in some ways, to giving our hard-earned dollars and future health benefits to other people with whom we share little connection. If people were exclusively self-interested (which is to say "other-disinterested"), then this lack of connection to future selves would undermine our

generosity toward them. Yet, as Whiting (1986) points out, we often make sacrifices for others (particularly close others) and do not always act in self-interested ways. Parents regularly give up aspects of their lives to ensure that their children are better off now and in the future, adult children make sacrifices for their aging parents, and healthy marriages often entail the partners giving up something for the other.

These observations suggest treating the future self as another person might facilitate providing for that future self in some contexts. Consider the categories of relationships that people can form with others, and the dimensions on which these relationships may vary. If the future self were to be thought of as another person, then what is crucial for understanding how people make intertemporal tradeoffs is knowing which category of “other” to which the future self belongs. If the future self is perceived more like another person with whom one shares few common bonds—more like a distant co-worker or even a stranger—then people might serve the wishes of the current self. If instead, the future self is perceived as a close other – for example, an other with whom there is a shared emotional bond – then, in some cases, the current self might make sacrifices today for the future self’s well-being (even if that emotional bond is to some extent imaginary, in the way that one might still feel an emotional connection to a loved one who is no longer alive or not yet born).

So, it is possible that one way of promoting the wishes of the future self might be to treat that self like a close other, one for whom present sacrifices are encouraged. And in some cases, a separation between selves might possibly help people behave more prudently, although this conjecture deserves more empirical scrutiny (c.f., Peetz & Wilson, 2013). The notion is that it might be easier to maintain your bad habits if you think you are only hurting yourself—people might be more reluctant to subject negative outcomes to others than to themselves. We could imagine that the lack of harmful externalities might undercut one’s attempt at changing their behavior for the better, like in the case of smokers who quit smoking to benefit their family members’ health, or healthcare staff who are more likely to maintain good hygiene practices when they are reminded that they are in a hospital to take care of others (Grant & Hofmann, 2011). People may be willing, in other words, to take risks with themselves that they would not take for others.

Recent work suggests that thinking of the future self as at least separate from the current self can affect intertemporal decision-making. Peetz and Wilson (2013), for example, found that

people classify selves on either side of a temporal divide (e.g., New Year's Day) as belonging to different categories, and that they do so spontaneously in an effort to create distance between selves over time (Peetz & Wilson, 2014). Importantly, when a temporal landmark such as a birthday parses the current self from the future self, research participants are more likely to take the actions necessary to create a better future self. In other words, the temporal barrier allowed people to see a contrast between present and future selves, and this contrast was more likely to activate self-improvement processes (Peetz & Wilson, 2013).

Other research has shown that temporal landmarks – such as the start of a new year, new month, or even, new week – help separate the past self from the present self, allowing people to relegate imperfections into earlier time periods and plan aspirational behaviors for selves that exist on the other side of the temporal divide (e.g., dieting; Dai, Milkman, & Riis, 2014, 2015). Theorists have also suggested that as a new temporal divide approaches – in the form of a major milestone birthday – people may be more likely to take stock of their lives (Neugarten & Hagestad, 1976). In fact, Alter and Hershfield (2014) suggest that taking stock of one's life before the present self – e.g., at age 39 – becomes a seemingly older future self – e.g., a 40-year-old – can lead to a search for meaning, a pursuit that can result in positive outcomes (signing up to run a marathon) or negative ones (signing up for a dating website that specializes in extramarital affairs).

In the work we just reviewed, the future self is seen as separated from the current self, but this is not the same as viewing the future self as an explicitly different person altogether. A recent study on university employees comes closer to treating the future self as another person. Namely, Bryan and Hershfield (2012) found that a retirement appeal that explicitly mentioned one's responsibility toward the future self (e.g., "Your future self is completely dependent on you"), increased retirement saving more than a traditional self-interested appeal (e.g., "It is in your long-term interest to save for the future") did. The mention of the future self only produced changes in saving when employees already noted that they felt similar and connected to their future selves. It was helpful to see the future self as another person, but only if it was another person to whom respondents felt a sense of emotional connection. Nonetheless, Bryan and Hershfield (2012) never explicitly tested whether mentions of the future self as another person were the motivating force behind their results. Future work may thus want to further investigate whether messages that frame the future self as an other are more effective at changing saving

behavior than messages that take a different frame (e.g., the future self as a continuation of the present self).

Taken together, the “future self as another” perspective considers the ways in which the future self may be thought of as another person altogether (either metaphorically or literally), and how such thoughts can affect intertemporal decision-making. In the next section, we discuss a different theoretical perspective, one in which what matters for intertemporal decision-making is the sense of continuity between selves over time.

Continuity Between Selves Over Time

Many philosophers have theorized about how we ought to think about the future self and how we should conceptualize what is meant by a lifetime. Whereas much of this (normative) argumentation can seem somewhat abstract, the practical consequences of our representations of what makes a person or a lifetime can be significant. For example, the specific view of what constitutes continuity over a lifetime ought to influence the way one thinks about beginning-of-life issues (e.g., abortion), end-of-life issues (e.g., right to die, estate planning), or whether a future version of someone should be held responsible for a previous person’s actions. Philosophers have posed thought experiments that invite the reader to consider whether a person persists over the course of transformations, how this is affected by the kinds of transformations the person experiences, (see, e.g., Lewis, 1976; Nozick, 1981). Parfit (1984) questions which features of a person have to be sustained to support the continuity of a person, and how numerous and strong the connections between those features have to be for a later person to count as being the same as the original person. He maintains that a reduction in the number and strength of connections between psychological aspects of a person can warrant a reduction in concern for one’s future self (Parfit, 1971). Put another way, when deciding whether to allocate a set of resources to the current self or a set of resources to the future self, what should matter is the “psychological connectedness” – or overlap in personality, beliefs, ideals, preferences, etc. (Perry, 1972, Unger, 1991) – between these selves. With enough overlap, all else being equal, one should be willing to delay commensurate rewards to a future self. But with sufficiently less psychological overlap between selves, one should consume now and ignore the interests of the future self. (Parfit’s normative arguments are controversial; see Dancy, 1997, for an edited volume presenting some opposing views.)

Notably, this perspective on current and future selves does not state that the future self must be seen as another person. Rather, the future self is viewed as a continuation of the current self, but with varying degrees of overlap. Future versions of the self may seem almost identical to the current self or they may be quite different; what matters for patience over time is the degree of continuity that is felt (Bartels & Rips, 2010; Bartels & Urminsky, 2011). In our work, we have often used the terms “connectedness” and “continuity” almost interchangeably because for the majority of contexts we test, they are almost synonymous. But, one way to characterize the difference is that connectedness can be assessed between any two stages of a person (e.g., how much overlap is there in the important psychological characteristics between the 18-year-old and 50-year-old version of some person?), whereas continuity can be assessed over all adjacent stages of a person (e.g., the proportion of those characteristics that are maintained between the 18- and 19-year old persons, the 19- and 20-year-old persons, ..., and the 49- and 50-year-old versions).

Measuring and Manipulating the Link Between Continuity and Patience

Early work by Frederick (2003) investigated the link between psychological connectedness and discounting of financial rewards by asking research participants to rate how connected they felt to future versions of themselves via a numerical scale (0 = completely different; 100 = exactly the same), and then complete a *temporal discounting* task, in which participants had to make choices between smaller amounts of money that they could receive immediately versus larger amounts of money that would arrive at a delay. This initial examination found no link between perceived connectedness and patience for financial rewards. But, using a different measure of connectedness – one that used pairs of successively overlapping circles to represent continuity with future selves (see Figure 1) – Ersner-Hershfield, Garton, Ballard, Samanez-Larkin, and Knutson (2009) found a correlation between ratings of connectedness and patience on an incentive-compatible temporal discounting task, with higher levels of connectedness being positively linked to more patience: participants who felt a greater sense of connection with a future self in 10 years were more willing to wait for larger financial rewards. Respondents who reported greater connection to their future selves had also accumulated more financial assets over time, a relationship that held when controlling for age (which has been found to correlate positively with future self-continuity (Rutt & Loeckenhoff, 2016), income, and education.

At the same time, Bartels and Rips (2010) ran experiments to determine whether changes in perceived connectedness can cause changes in temporal discounting of financial rewards. In some studies, when research participants read vignettes about third parties—hypothetical people who had undergone identity-altering events (e.g., a cross-country move)—participants allocated more funds to the person before rather than after such connectedness-reducing events, providing the first experimental evidence that changes in connectedness causes changes in time preferences. People were less willing to provide benefits to someone else’s “future self “ when the target had undergone a large change indicating a significant discontinuity in the person’s life. Bartels and Rips (2010) also found that people discount the value of rewards more over those periods in which they perceive more personal change (larger decreases in connectedness), as a result of the experimental manipulations

Further evidence for the link between connectedness and patience comes from social neuroscience research. As mentioned earlier, Ersner-Hershfield, Wimmer, et al. (2009) found that neural patterns for thoughts about the future self more closely mimicked neural patterns for thoughts about other people (rather than the neural patterns elicited by thinking about the present self). But there was individual variability in these neural differences: for some participants, thinking about the future self caused neural activation patterns that were almost exactly like patterns that were caused by thinking about another person; for other participants, thinking about the future self showed neural activation patterns that were more or less in line with patterns caused by thinking about the current self. Because other research has shown that a similar region of the brain (i.e., the ventral medial prefrontal cortex) was more strongly active when participants made judgments about the mental states of others who were perceived to be similar to oneself (Mitchell, Macrae, & Banaji, 2006), we interpret variability in neural activation patterns between the current self and the future self to be suggestive of variations in continuity. Along these lines, participants who showed the biggest difference between activation elicited by the current self and activation elicited by the future self (suggesting that they perceived a relative lack of self-continuity over time) were the least patient when it came to waiting for financial rewards (Ersner-Hershfield, Wimmer, et al. 2009).

Recent research has found similar relationships between perceived self-continuity and decision-making in other contexts. For example, higher levels of continuity can help explain the link between power and lower discount rates (Joshi & Fast, 2013; see also Garbinsky, Klesse, &

Aaker, 2014). Other work has found that higher levels of self-continuity are positively correlated with better academic performance (Adelman et al., 2016), a lower likelihood to procrastinate the completion of immediately undesirable tasks (Blouin-Hudon & Pychyl, 2015), a higher likelihood of saving money for the future self rather than giving it to others (Bartels, Kvaran, & Nichols, 2013), and the tendency to forego immediately rewarding but ethically dubious courses of action (Hershfield, Cohen, & Thompson, 2012), a relationship that was distinct from trait levels of self-control (Tangney, Baumeister, & Boone, 2004). In a consumer behavior context, elevated self-continuity is correlated with evaluations of products, brands, and charitable causes meant to be consumed by distant selves (Zhang & Aggarwal, 2015). Conversely, anthropological research found that young people in Canada who had disrupted perceptions of personal identity over time (e.g., because they were part of cultural groups that lacked a sense of cultural continuity) showed dramatically elevated suicide risk (Chandler & Lalonde, 1998). Although these grave events have many causes, Chandler and Lalonde (1998) suggest that these young people, who had a difficult time envisioning, explaining, and empathizing with what they'd be like in the future, were less likely to realize their futures, engaging in behaviors that could be interpreted as extreme expression of alienation from and disregard for the future self.

Recent research has investigated whether manipulating perceived connectedness in a person can also change her patience for outcomes she will receive. Using a variety of methods to alter perceived connectedness (e.g., by telling research participants that research has found that identity is relatively stable or unstable over time), Bartels and Urminsky (2011) found that increasing a person's sense of connection with her future self makes her more patient for financial rewards and consumption experiences. Importantly, the researchers showed that this relationship between connectedness and patience was distinct from other related constructs such as uncertainty of future preferences, predicted change in spending money and free time, positive and negative affect, abstract construal, future time perspective, and self-control. Manipulating levels of connectedness to future selves has also been linked to more ethical decision-making (Hershfield, et al. 2012; Sheldon & Fishbach, 2015), higher grade point averages among children (Nurra & Oyserman, 2015), and personal giving, with lower levels of connectedness leading to more generosity to others with future allocations of money (Bartels et al., 2013).

What is Meant by Continuity?

Although this work has established that there is an important relationship between self-continuity and intertemporal decisions, there has been debate in the literature regarding what exactly continuity entails. This debate has only recently motivated empirical investigations. Theorists disagree about what kind of continuity matters the most. Some philosophers argue that what is most important for the continuity of a person over time is continuity with respect to her consciousness (e.g., Locke, 1975), her body (e.g., Olson, 1997), or various aspects of her psychology (e.g., Johnston, 1987). The following thought experiment was designed to examine what comprises continuity: In which of the following two cases is the self preserved? In one case, one's brain is transplanted to a new body and all memories remain intact, and in the other case, all memories are lost. Intuitively, it seems as if the "self" is preserved when memories are left intact but not when they are destroyed (an intuition that is at the heart of many science fiction stories, e.g., Saunders (1992)). . Indeed, a recent study found that people believed a hypothetical character would be less himself if his memories were erased compared to a situation in which they were preserved (Blok, Newman, & Rips, 2005). And yet, consider another thought experiment in which you'll be tortured tomorrow, but beforehand, complete amnesia will be induced (Nichols & Bruno, 2010; Williams, 1970). None of your memories will survive, but what is the response to the prospect of this torture? If it is fear, then that suggests you feel that *you* will still feel pain, despite the fact that your memories have been demolished. Such thoughts represent an obvious contradiction to the results of the earlier thought experiment.

Apparent contradictions about which kinds of continuity are important has given rise to research asking what laypeople think matters most for continuity. Is it more physical or psychological in nature? In recent work, Nichols and Bruno (2010) examined this question and found that when psychological versus physical continuity are pitted against each other, a majority of people felt that a person's psychology—particularly, their memories—was more important for the continuity of identity.

Other research has examined in more detail which aspects of psychological continuity matter. Specifically, Strohminger and Nichols (2014) found that moral traits (e.g., empathy for the suffering of others) were most central to perceptions of self-continuity, followed by memory (especially emotional and autobiographical memory). Perceptual traits such as the ability to feel pain or see color were most weakly linked to the preservation of identity over time. In follow-up research, Strohminger and Nichols (2015) asked family members of patients with frontotemporal

dementia (FTD), Alzheimer’s disease (AD), and amyotrophic lateral sclerosis (ALS) to rate the extent to which the patients’ identities had remained stable since the onset of disease (e.g., “regardless of the severity of the illness, how much do you sense that the patient is still the same person underneath?”). Patients with FTD, the disease that affects moral traits the most (e.g., decreased inhibition and decreased warmth toward others) were rated as having experienced the most disrupted identity. Taken together, it seems that what matters when considering continuity between successive selves is a sense that a person’s core identity is preserved, and different categories of features are given different weight, in the following order: morality, then personality, then preferences, experiences, and memories (Strohming & Nichols, 2014).

Adding another layer to this work, Molouki and Bartels (2016) examined whether specific kinds of changes to these various categories of features were especially threatening to self-continuity. In their experiments, they asked participants to imagine that a specific feature (drawn from the categories of morality, personality, etc.) changed over the next year and then considered whether, after the change, they would still be substantially the same person they are now, or whether they’d be a different person. Crucially, they found that *improvements* in such features do not undermine a perception of self-continuity, arguing that people generally expect and desire improvement, and changes consistent with these expectations promote self-continuity.

People appear to have theories of how their lives will play out, and future scenarios that differ from those ideas cause a sense of discontinuity. People also have theories of how they came to be the person they are—they have ideas about how the features in their self-concept (e.g., memories, moral qualities, personality traits) are causally linked. For instance, they have theories about how their memories might have caused their personality traits, and these theories contribute to their sense of continuity as a person. Chen, Urminsky, and Bartels (2016) found that some features are perceived to be more causally central than others and that changes in such causally central features are believed to be more disruptive to one’s continuity.

Taken together, a sense of connection between selves over time is causally related to patience over time. Moreover, research in this area has suggested (i) that people place a special emphasis on psychological continuity, (ii) that some kinds of psychological features tend to contribute more to continuity than others (e.g., moral qualities vs. other personality traits), and that (iii) people’s ideas about the future (i.e., their desire and expectation for positive changes on some features) as well as (iv) their ideas about their past (i.e., how some of their features cause

or are affected by others) all have an important role to play in determining how we see continuity in our lives and in the lives of others. We next turn to a final grouping of theories that discuss the ways in which failures to fully imagine the future self can influence decision-making.

Failures of Imagination

An inability to fully think through the implications of one's choices can complicate intertemporal choices. For example, some research suggests that people don't often account for even the very temporally near opportunity costs presented by their choices—that is, not buying a \$15 item at a store leaves you with \$15 to be used for other purposes (Frederick, Novemsky, Wang, Dhar, & Nowls, 2009; Spiller, 2011; Bartels & Urminsky, 2015). Of course, the difficulties get even more complicated for choices with more distant future outcomes, as even the most earnest attempts to imagine what the future will be like will engender representations of future situations that miss (sometimes important) details. Along these lines, Plato (2008) and Pigou (1932) note that distant future experiences may be imagined less vividly and seem less real. Because the future self can only be accessed via imagination, the ability to vividly represent the future self – that is, the ability to not succumb to failures of imagination – may help explain why some people give more or less weight to the concerns of the future self (Blouin-Hedon & Pychyl, 2015).

Vivid perceptions of the future could be crucial for making decisions that have different consequences over time. Vivid examples are often processed more emotionally, and this can affect generosity. For example, the literature on charitable giving suggests vivid appeals are more likely to evoke sympathy and subsequent donations compared to ones that are “colder”—more pallid and/or less emotional appeals. A picture of one starving child can increase generosity more than a passage detailing the number of children who have been affected by malnourishment (Slovic, Vastfjall, Gregory, & Olson, 2016). For this reason, when making intertemporal decisions, the present self may be theoretically favored over the future self if the future self – and its wants, desires, and emotions – is not represented vividly.

Failures of imagination can have many causes. When imagining a future situation, greater temporal distance can result in perceptions of a future self that is more abstract and less detailed (e.g., Trope & Liberman, 2010). With more abstraction, it can be more difficult to fully imagine the emotional experiences of a future self. And, when imagining emotional reactions to future events, people believe that their responses will be less extreme. That is, participants believe that

future events will produce less intense pains and pleasures than if the same event were to occur in the present (Kassam, Gilbert, Boston, & Wilson, 2008). The reverse has also been demonstrated: events that are described as being more intensely emotional are also perceived as less psychologically distant (Van Boven, Kane, McGraw, & Dale, 2010). As a result, the future self tends to be “dehumanized,” and stripped of the warmth and human nature that one might ascribe to the current self (Haslam & Bain, 2007).

Even when people do understand the idea that future events may provoke emotional reactions similar to ones felt in the present, it can nonetheless be challenging to fully understand the future self’s preferences, opinions, and feelings precisely because such feelings and preferences may change once one *becomes* one’s future self. Paul (2015), for example proposes a thought experiment wherein all of one’s close friends and family members have decided to become vampires, claiming that it is the best decision they’ve made. The available data suggests that you will also enjoy the life of a vampire (e.g., the nightlife and the fashionable capes), but the catch is that once you decide to make this transformation, you can never undo it. As is the case with many major life choices, this decision carries with it a great deal of weight: once you become your future self – in this case, a vampire (or a parent) – the preferences that you hold may be fundamentally different from the ones held by the present self. A failure of imagination, then, can occur simply because it can be impossible to know how future tastes may change once the future arrives. So, transformative experiences represent one set of experiences where failures of imagination are inevitable.

But there may be other, more banal situations where failures of imagination also arise. Given the many ways that contextual factors influence identity, people may have a difficult time imagining which future self – among many possible future selves – will arise (e.g., Oyserman, 2015; Oyserman, Elmore, & Smith, 2012; Oyserman, this volume). And, when it comes to imagining much older selves, people may simply be unmotivated to fully engage, due to the negative stereotypes that are associated with the aging process (Levy, Slade, Kunkel, & Kasl, 2002), older people in general (North & Fiske, 2012), and a desire to avoid thinking about death (e.g., Pyszczynski, Solomon, & Greenberg, 2015).

As failures of imagination can reduce the concern afforded to future selves in intertemporal decision-making contexts, recent research has attempted to aid people in the exercise of imagining future selves. For example, Lewis and Oyserman (2015) found that when

research participants were asked to think about the distance between now and some future event in a granular metric (like days), they were more likely to want to take action (e.g., think that they need to start saving sooner for retirement or for their child's education) than when they thought about that distance in a less granular way, like months or years. The granular metric made the future self seem like it was temporally closer (Zauberman, Kim, Malkoc, & Bettman, 2009) to the current self (and presumably more detailed, though the authors did not explicitly test this possibility). More directly, Hershfield et al. (2011) found that research participants who had been exposed to age-progressed avatars expressed more financial patience on a variety of laboratory decision-making tasks. Exposure to such images also resulted in a decreased likelihood of cheating in a laboratory setting (van Gelder, Hershfield, & Nordgren, 2013) and lower levels of delinquent behavior among adolescents in a longitudinal study (van Gelder, Luciano, Kranenberg, & Hershfield, 2015). In the health domain, participants who saw a weight-reduced future self ate less ice cream in an ostensible taste test and were also significantly more likely to try a sugar-free drink as a reward (Kuo, Lee, & Chiou, in press).

Finally, there may be times that people do attempt to imagine the future, but fail to do so in a realistic, grounded way. A recent body of research, for example, has examined how indulging in positive thoughts and images about the future (and the future self) versus grounded expectations about the future affects behavior over time. Oettingen (2012) and colleagues have found that positively daydreaming and fantasizing about the future can lead to worse future outcomes than allowing also for negative thoughts and images; in contrast, judging the future as likely to be positive, as in people's positive expectations, predicted better future outcomes than judging the future to become bleak (Oettingen & Mayer, 2002). Positive fantasies about idealized futures can sap the energy and motivation needed to pursue that fantasized future (H.B. Kappes & Oettingen, 2011). Such positive fantasies have predicted subsequent low effort and low success in a variety of different outcome domains, including weight loss, academic performance, romantic relationships, and job pursuit (Oettingen & Mayer, 2002; Oettingen & Wadden, 1991). For example, among low socioeconomic status students, positive fantasies predicted more days absent and lower grades by the end of a vocational education program (even when controlling for initial academic performance; H.B. Kappes, Oettingen, & Mayer, 2012). In the mental health domain, a recent paper found that engaging in positive fantasies about the future was related to increased depressive symptoms for up to seven months after measurement

(Oettingen, Mayer, & Portnow, 2016). And, positive fantasies seem particularly likely to arise when people have a strong need to that is currently unmet (Kappes, Schwörer, & Oettingen, 2012).

Taken together, this grouping of theories and empirical papers suggests that one cause of impoverished intertemporal decision-making is the inability to fully and vividly imagine a realistic future self. We next discuss some avenues for potential future research.

Remaining Questions and Areas for Future Exploration

Although some progress has been made, there are many avenues for future research that will help to clarify and extend some of the ideas above as well as to open up new areas of research on the future self. Below, we highlight a few promising directions.

Naturally Occurring Differences in Imaginative Capabilities

Notably, although previous studies have demonstrated that imagination aids reduce discounting (e.g., Hershfield et al., 2011), no research has directly examined whether people with better imaginations are also naturally more patient. To some extent, a recent neuroimaging study suggests that a failure of imagination is related to discounting (Cooper, Kable, Kim, & Zauberman, 2013). Could it also be the case that people with more vivid imaginations, i.e., more of an ability to conjure the future self, are also more likely to be patient with future rewards?

End-Of-Life Decision-Making

Many policy issues concern end-of-life decisions, such as the selection of medical care plans and beneficiaries. Although there is debate about what the optimal choice might be, many policymakers would prefer that people make well-informed choices about alternative courses of actions in these contexts, rather than end up in a given situation because it was the default course of action. Yet, recent work suggests that people may fail to spend the time required to make difficult end-of-life decisions because of the aversive nature of thinking about one's death (Salisbury & Nenkov, in press). Death, however, represents another temporal landmark that brings with it its own complicated philosophical issues (Newman, Blok, & Rips, 2006). It could be valuable to learn more about whether, for example, a belief in the afterlife—believing that some version of the self exists after biological death—affects the ease with which people make (or the unease they feel about making) end-of-life decisions (which might be believed to affect a version of the self that exists in the afterlife). Further, could a sense of connection with one's

offspring relate to how much one wants to promote their interests after death, much as connectedness to one's future self might promote the interests of the future self during one's life?

Calibration Regarding How Much the Future Self Will Resemble the Current Self

Much of this review has focused on the ways in which the interests of the current self can at times outweigh those of the future self, with a large focus on how failing to fully consider the future self can lead to suboptimal situations for that distant self. For example, the current self may want to spend money and assume that the future self will be comfortable leading a more frugal life (when in fact she may not be). It's also possible—and quite plausible, actually—that people project more continuity than will obtain. That is, we may overweight the extent to which our current self's interests extend to the future self (e.g., the meaning of the tattoo I am about to get will always be important to me). There might be motivational reasons for this expectation of constancy, which might be an overestimation of actual constancy (Quoidbach, Gilbert, & Wilson, 2013). Recognizing that tastes and other characteristics will change can be akin to recognizing that the current self isn't as constant as we normally assume it to be, which could be anxiety-inducing (Proust, 1949; Pyszczynski et al., 2015). If people predict more constancy in their self than actually obtains (or if they predict less), how might this affect the quality of the choices they make for those future selves? There are a host of questions left to be explored here.

Empirical Links Between Various Theories

In reviewing the literature, we have noticed that the various distinctions between future self as another, continuity, and failure of imagination research traditions can often be blurred and overlapping. Questions arise regarding what exactly the links are between the various lines of research referenced in this chapter. A previous review (Hershfield, 2011) suggested that there might in fact be bi-directional links between connectedness, liking, and vividness. And as an example of how these ideas might come together, Hershfield et al. (2011) found that viewing age-progressed images (thus increasing vividness of imagination) also increased perceived continuity with a retirement-aged self. Bartels and Urminsky (2015) orthogonally manipulated (i) psychological connectedness and (ii) factors relating to failures of imagination—namely, the salience of tradeoffs inherent in spending vs. saving decisions and found that the two factors jointly determined people's choices. We noted earlier that sometimes, people fail to think through the opportunity cost of their choices—that spending \$15 on this item means not having that \$15 available to spend on something else or to save it for the future. It turns out that in order

for people's feelings of connectedness to the future self (which affect their valuation of that future self's outcomes) to influence their decisions in the present, people need to be thinking through these tradeoffs. In these studies, people reduced their discretionary spending (to save for the future self) only when made to feel highly connected to the future self (i.e., causing them to value their future outcomes more) and when the opportunity costs of present spending—i.e., the tradeoffs posed by these decisions—were highlighted.

More work should be done to investigate the relationships between the many factors noted in this review. For example, when might *continuity of the self* versus the (perceived) *otherness of the future self* affect decision-making differently? Here, we suggest that an important factor is the time-scale of intertemporal decisions. It seems likely that there is a high degree of psychological continuity between the night-time self who stays up late watching old episodes of *Law and Order* and the morning self who is exhausted and groggy from only getting 5 hours of sleep (Gammill & Pross, 1993). There is, in other words, no good reason to suspect that these two particular selves don't share the types of things that promote psychological continuity over time (e.g., moral values), though of course other things may differ between these selves, such as their goals and desires. So, in order to produce good outcomes for both of these selves (e.g., to smooth utility across them, rather than slighting either one), it could be useful to view the future self (tomorrow morning) as another person with whom one has a close emotional bond. That is, in the short term, "other person" or "simultaneously existing, competing selves" theories of the future self might tell us the most about how to promote prudence. In contrast, over longer periods of time where greater personal change might occur (e.g., between an earlier time point and retirement), theories about psychological continuity and/or the nature of our relationship with the future self (close or distant) may be most informative.

Future work may also help us better understand the link between future self-continuity and delay of gratification. At first glance, continuity with one's future self may be a necessary precursor to the ability to delay gratification in general. Yet, in the traditional empirical contexts in which delay of gratification has been investigated (e.g., children choosing between one treat now versus two after a 10-15 minute delay; Metcalfe & Mischel, 1999), it is hard to imagine that there could be measurable discontinuities between selves over a fifteen-minute delay. Rather, what may matter more in such short-term contexts is whether the current self can accurately anticipate the feelings of the future self.

Another important direction for future research is to understand what underlies concern for a future self. Some minimalist accounts, like Parfit's (1984), argue that concern for the future self should be tied almost exclusively to psychological connectedness. It seems quite possible, however, that the ability to imagine the future self, independent from feelings of connectedness, may promote concern. For example, prompts to consider the existence of the future self may increase concern, particularly where those prompts increase the vividness of the representation of that future self. Additionally, if one does not have an ability to adequately imagine the future self, connectedness may impair one's ability to make decisions that are in the best interest of the future self. For example, if a person believes that she will remain mostly the same over time—i.e., is highly connected to the future self—her simulations of her future self may be overly similar to what her current self looks like and lead to decisions that undermine the future self's well-being. For example, putting off a rock-climbing vacation so that a future self can enjoy it may not be a good idea if that future self doesn't have the abilities and preferences of the current self. We leave it to future (and ongoing) work to examine these interesting possibilities.

Conclusion

People must regularly tradeoff present wants and desires against future ideals and hopes. Previous research has gone a long way toward understanding some of the antecedents and consequences of such intertemporal choices. Here, we take a slightly different approach and focus on the thoughts that people have about their selves over time, and how such thoughts can affect the decisions that they make. We have discussed three groups of theoretical perspectives that have received empirical attention over the last several years. First, "future self as another" theories examine the extent to which the future self is seen as a separate, different person from the current self. Second, "continuity" theories focus on the degree of psychological overlap that is perceived between selves over time. Third, "failures of imagination" theories look at how vividly people are able to represent their future selves. This research has used both measurement of individual differences and experimental designs to better understand how considerations of the future self affect the propensity to make prudent long-term decisions. Although this recent research has made impressive strides, much still remains to be done. We leave it to your future selves and ours to push this body of work further along.

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Figure

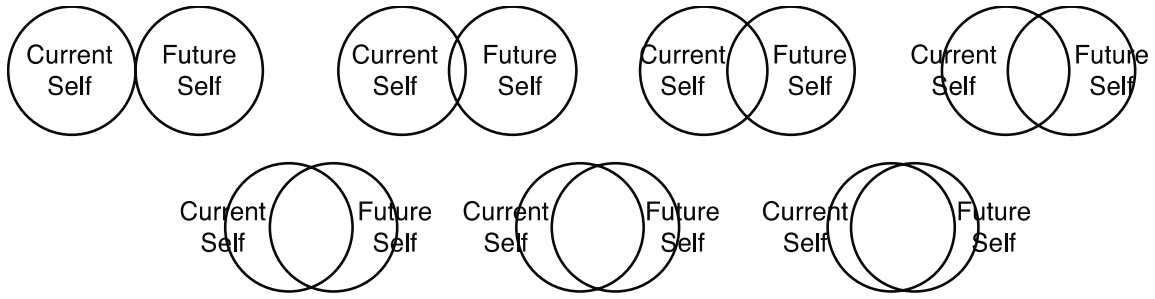


Figure 1. Pictorial scale used to measure continuity with future selves (Ersner-Hershfield et al., 2009; Bartels & Rips, 2010)