

**LOOKING FORWARD:  
TIME, CHANGE, AND THE PERSISTENTLY POSITIVE FUTURE**

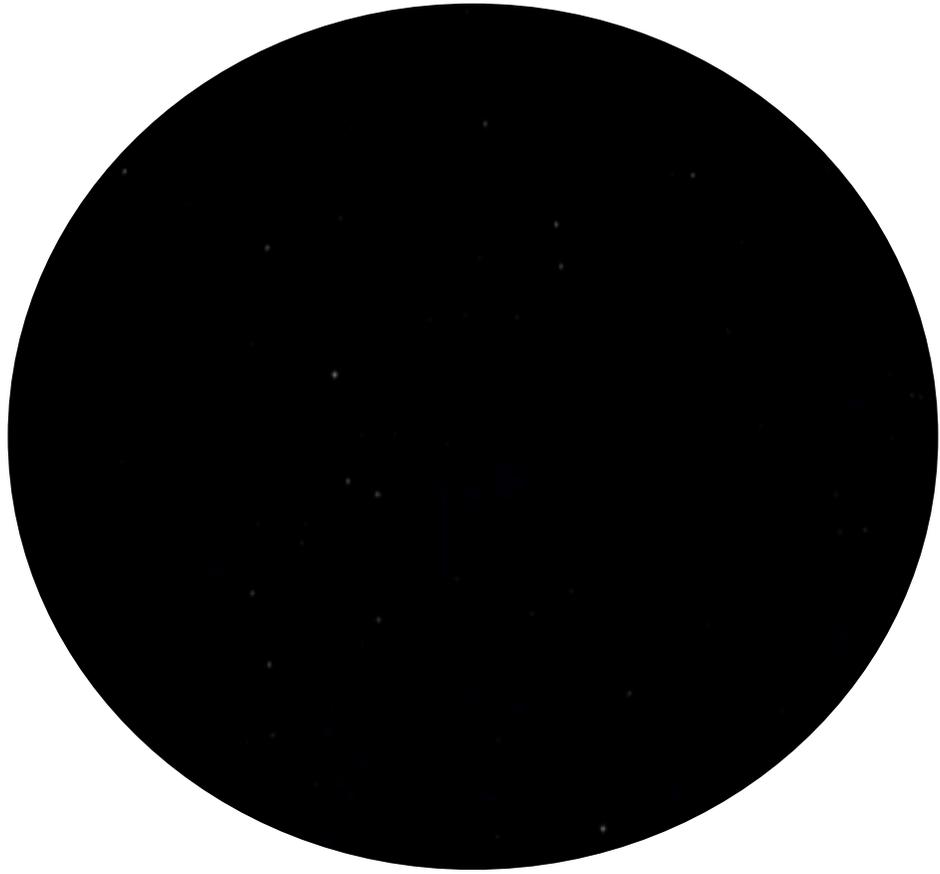
by

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## **DEDICATION**

To Lin: my persistently positive past, present, and future.

## ACKNOWLEDGEMENTS

This is the part where I'm supposed to reflect back on my life and figure out the people and events that got me here, to thank what made this possible. But it's a hard task, because in life you can never know for sure how slightly different experiences might or might not have changed it all. Nonetheless, I'm pretty confident about a few things:

- 1) If everything I wanted to happen happened, I wouldn't be here—some of the most challenging and unexpected circumstances lit the fire in me to go to grad school;
- 2) If certain people didn't put their faith in me, I wouldn't be here—Joe Feeney, Phyllis Anastasio, Matt Anderson, Brad Bushman, Steve Garcia, Dick Nisbett, Sara Konrath, Phoebe Ellsworth, and Norbert Schwarz were all critically involved in either me being admitted to Michigan and/or staying and thriving, along with Leaf Van Boven, Troy Campbell, and Katherine Burson serving as vital support;
- 3) If my friends weren't around, I wouldn't be here—Kevin Smith, Ryan Bremner, Spike Lee, Eric Smith, Rob Kononowech, and Bill Chopik make it all worthwhile, along with many others who I feel fortunate to say are too numerous to list here;
- 4) If I never met Linda, I wouldn't be here—I will feel forever indebted to Michigan for a host reasons, but none are more important than for bringing us together;
- 5) If it weren't for my family, I wouldn't be here—Mom, Dad, G, Awe, Ahmom, and Big Ed, you're listed last because you've shaped all I've done and will do.

THANK YOU! My time in Ann Arbor has been the best of my life, made possible by these things. Oh, and Clooney (note to self: use this as a speech if I ever win an Oscar).

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## **ABSTRACT**

Thinking about past and future experiences is a fundamental component of mental and social life. My goal is to explore asymmetries in how people's perceptions of the future uniquely differ from perceptions of similar experiences in the past and present. A large literature suggests that people are pervasively optimistic about the future, believing their lives are headed in an increasingly positive direction. I seek to examine how such beliefs come to be maintained and reinforced. Two particular "strategies" are highlighted, the evidence for which is drawn from 11 studies across 2 empirical papers. First, I show that people simply discount cues that forewarn of negative events in their futures, stubbornly believing that those events will not actually occur ("Easy to Retrieve but Hard to Believe: Metacognitive Discounting of the Unpleasantly Possible: O'Brien, 2013). Second, I show that people perceive their future selves as possessing superior mental capacities compared to their past and present selves; hence, even if bad events were to happen, people believe their future selves will be better equipped to handle them ("Emotional Pasts and Rational Futures: The Mind Perception of Self Over Time": O'Brien, 2014). Taken together, these findings reveal that people are persistently optimistic by reinforcing their perceptions of a positive future across two routes: in how they perceive the likelihood of external events, and in how they perceive changes in their own internal abilities. This observation helps integrate the existing literature on optimism by making predictions about when a positive future should signify an advantageous boon versus a problematic bias. And more broadly, my dissertation seeks to highlight time as a central construct of social psychology study.

## CHAPTER I

### Time in the Mind

“Where is it, this present? It has melted in our grasp, fled ere we could touch it, gone in the instant of becoming...In short, [it] is no knife-edge but a saddle-back, with a certain breadth of its own on which we sit perched, and from which we look in two directions...”

— William James, *The Principles of Psychology* (1890, Ch. XV, p. 608)

It is difficult to imagine a mental system that cannot process time. Our sense of duration helps us plan and prepare; our sense of sequence instills order and meaning; and our sense of change impels us toward growth, progress, and fulfillment. And yet, with so many temporal components at work, our actual experience of time eludes us. Moments come and go, their tangible reality ever fleeting, and we are left with little beyond a psychological present that “barely has time to exist” (Kahneman & Riis, 2005, p. 285). The real importance of time to social psychology, then, may depend less on its in situ phenomenology and more on how people *think about* temporal life at a distance.

As James notes in the opening quote above, one fundamental way in which people think about time is in terms of tense: if the present swiftly expires, then what endures are perceptions of moments once felt and of those still to come. James’ “two directions” thus comprise the focus of my dissertation, and in particular the differences that can emerge when people think about a given experience as it already occurred in their pasts versus how they believe it might unfold in their futures. My central thesis is that perceptions of

the future are perpetually more positive than perceptions of the past and present, even when there is reason to believe otherwise. I seek to demonstrate specifically how these optimistic beliefs come to be maintained and reinforced. First, I show that people simply discount cues that forewarn of negative events in the future, stubbornly believing those events will not actually occur. Second, I show that people perceive their future selves as possessing superior mental capacities as compared to their past and present selves; hence, even if bad events were to take place, people believe that their future selves will be better equipped to handle them. Ultimately, I argue that people are *persistently* optimistic by actively reinforcing a positive future in at least two distinct ways: in how they (i) predict the probability of external events, and (ii) perceive changes in their own internal states.

I begin by outlining the literature on “temporal asymmetries,” a growing body of work that highlights general differences in how people mentally represent the same event at equidistant points in the past versus in the future. I then focus more specifically on one pervasive difference—the future’s strong association with positive change—and discuss relevant findings in the optimism literature since Weinstein’s (1980) foundational studies on how people estimate their own versus others’ likelihood of encountering good and bad life outcomes. Next, I describe how my own findings can help integrate and supplement this work, and provide evidence across 11 studies from 2 empirical papers. Finally, I end by proposing unexplored research questions that might further advance the topic at hand.

Despite James’ discerning words from nearly 130 years ago, social psychology is only beginning to consider time as a central construct of study. I hope this dissertation helps shed light on the dynamic impact of temporal forces in social and mental life, and in shaping how people actually experience the world in the ever fleeting here and now.

## Temporal Asymmetries

One of the more prominent social psychological frameworks in recent years is known as *construal level theory* (for a thorough review see Trope & Liberman, 2010). The basic proposition is that people process events differently depending on whether those events feel close to or far from current experience. Just as physical objects appear blurrier to our visual system the farther away they withdraw into space, construal level theory proposes that our mental representations lose detail the farther away they “feel” from us, and hence are processed on more abstract (versus concrete) dimensions. This effect has been demonstrated across a wide array of domains. In terms of social distance, for example, people tend to judge distant strangers according to abstract, bigger picture principles that are ‘hard to see’ (“*Why* did she get the job?”), whereas close friends are judged more according to ‘easy to see’ concrete details (“*What* did she wear to work?”: Liviatan, Trope, & Liberman, 2008). Most relevant for current purposes, construal level theory has also been applied to temporal distance: people tend to place a greater emphasis on abstract qualities when imagining events that are far away in time (“Will next year’s vacation be *fun*?”), but on concrete qualities when imagining events that are close in time (“Will tomorrow’s vacation be *feasible*?”: Liberman, Sagristano, & Trope, 2002).

Importantly, although this temporal construal framework has certainly helped integrate and advance a number of social psychological findings, it has been relatively silent about the potential role of tense. In other words, the theory assumes that the effect of “distance from now” is symmetric: people should process an event that is 1 year into the past in the same way as they would if the event were 1 year into the future, because

distance is held constant and thus their levels of abstraction are comparable. A growing body of work, however, has begun to uncover qualitative differences in how people think about past versus future events across an equidistant point in time, findings that have been termed “temporal asymmetries.” These asymmetries manifest in many forms.

For example, the popular metaphor of “time flies like an arrow” in Western thought invokes a spatial asymmetry: the past is mentally represented on the left side of space and feels like it is “behind” us, whereas we move “ahead” towards a future that is represented on the right side of space (Boroditsky & Ramscar, 2002). Further, people actually lean their bodies forwards and to the right when thinking about the future, but backwards and to the left when thinking about the past (Miles, Nind, & Macrae, 2010). People tend to view their future selves from a third-person perspective but their past selves from a first-person perspective (Pronin & Ross, 2006); and the future more generally feels closer to the present at a subjective level (Caruso, Van Boven, Chin, & Ward, 2013), evokes more arousal (Van Boven & Ashworth, 2007), and feels more intentional (Burns, Caruso, & Bartels, 2011) and important (Caruso, Gilbert, & Wilson) than thinking about similar events at an equidistant point in the past (see Van Boven, Kane, & McGraw, 2009 for a comprehensive review).

Clearly, then, thinking about the same event at a past, present, or future point can generate critical differences on various evaluative, emotional, and behavioral outcomes. Tense matters; 1 year into the past is not the same as 1 year into the future, even though objective distance and content are held constant. Next, I narrow my focus on perhaps the most pervasive and well-documented difference across tense: asymmetries in valence.

## Changing for the Better

The Beatles once famously admitted that “it’s getting better all the time.” Diverse empirical evidence confirms this familiar everyday experience: despite current conditions or whatever we have endured in the past, people cling to the idea that tomorrow promises greener pastures and sunnier circumstances, representing a robust temporal asymmetry.

Most people construct idealized versions of their futures (Higgins, 1987), which helps maintain self-esteem (Maslow, 1970), foster confidence (Sedikides & Skowronski, 2000), and subdue negative moods (Taylor & Brown, 1988), as well as motivate present action and goal-pursuit (Markus & Nurius, 1986; Taylor & Gollwitzer, 1995). The very narratives on which we rely to summarize and make sense of daily life are imbued with optimism: people generally believe their lives move *towards* something, that they learn and grow wiser over time (see Heckhausen & Krueger, 1993; Markus & Ruvolo, 1989; McAdams, 2006; Sedikides & Hepper, 2009). When people are asked to directly reflect on how they have changed in recent years, they tend to denigrate past selves in ways that bolster the present and future (e.g., “I used to lack brains, but now I’m much smarter and headed in the right direction”)—even if this criticism is unwarranted (e.g., when past and present intelligence scores do not objectively differ: Ross, 1989; Wilson & Ross, 2001).

In one especially influential demonstration that epitomizes optimism’s pervasive impact on perception and judgment, Weinstein (1980) asked college students to estimate their chances of experiencing various life events throughout adulthood. Participants also estimated the likelihood that other students from their university would encounter the same events within the same period. The results were clear. For nearly every desirable possibility (e.g., attaining a well-paying job, owning a home, living past 80 years old),

participants vastly overestimated their own chances compared to the chances of similar others, and also compared to base rates of objective likelihood. In contrast, for nearly every undesirable possibility (e.g., developing a drinking problem, having a heart attack, getting divorced), participants underestimated their own chances compared to others and also to base rates. People thus believe that their own futures will be uniquely bright. This claim has been further corroborated across numerous populations, settings, and measures (see Chambers & Windschitl, 2004; Schachter & Addis, 2007; Weinstein & Klein, 1996).

### **The Persistence of Optimism?**

In the past 30 or so years since Weinstein's (1980) seminal findings, research into optimism has largely fallen into 1 of 2 camps. On the one hand, researchers have sought to uncover positive benefits of perceiving a positive future, and to establish optimism as an advantageous tendency. Taylor and Brown (1988) famously argued that optimism is a key harbinger of health benefits, from enhancing mood and self-esteem, to strengthening coping abilities, to improving social relationships and professional productivity. Their more intriguing claim, however, was that such benefits should be gained even when optimistic beliefs are exaggerated, false, or unfounded, and in fact that "*accurate* self-knowledge may be *negatively* related to psychological health" (p. 197, italics added). More recently, Seligman (1998, 2008) and others in the positive psychology movement have sought to extend this notion to physiological outcomes, maintaining that optimism can help protect against stroke (Kim, Park, & Peterson, 2011), coronary heart disease (Kubzansky, 2001), and even death (Maruta, Colligan, Malinchoc, & Offord, 2000).

On the other hand, a different group of researchers has sought to establish optimism as a disadvantageous tendency, and to highlight its undermining impact on judgment accuracy. From this perspective, perceiving the future as overly positive is viewed as a bias with detrimental consequences. For example, the *planning fallacy* describes the systematic tendency for people to underestimate how much time they will need to successfully complete a task (Kahneman & Tversky, 1979). This misperception is thought to be driven by the optimistic belief that one's future will be successful even with poor planning in the past (Wilson, Meyers, & Gilbert, 2001), and that others are less fit to complete the task than oneself (Buehler, Griffin, & Ross, 2002). More generally, overestimating one's own skills compared to peers can lead people to pursue certain goals or tasks on which they will not actually be able to succeed (Moore & Healy, 2008). And of course, believing that others are more at risk of aversive life circumstances than oneself can discourage people from seeking out preventative treatments; changing one's current eating or buying habits seems unnecessary if future health or financial problems seem unlikely (Weinstein & Klein, 1995). Many such arguments are summarized in a recent popular press book, the title of which succinctly captures this camp's viewpoint: "The Optimism Bias: A Tour of the Irrationally Positive Brain" (Sharot, 2012).

In this dissertation, my goal is to take a more impartial perspective on the role of optimism in everyday experience. Rather than trying to argue for benefits versus biases, these disparate literatures might benefit from a broader analysis of how such beliefs come to be initially maintained and reinforced. In other words, understanding how optimism *persists*—how people perpetuate their positive beliefs about the future despite learning information that suggests otherwise (e.g., base rates, past failures, others' success)—

might help integrate the two perspectives, in pointing to different situations for *when* it may help and *when* it may backfire. Indeed, like most psychological constructs, optimism is likely not entirely beneficial or detrimental. Hence, I hope to shed more basic light on how and when optimistic beliefs exactly “stick,” so as to help disentangle the contexts in which the asymmetry should serve as something to embrace versus something to contain.

### **Preview of Empirical Evidence**

The approach of this dissertation is to highlight basic ways in which people reinforce their positive perceptions of the future. Two particular ‘routes’ are proposed, which are drawn from the results of 11 experiments across 2 original empirical papers.

The first route is external, in that it examines how people estimate the likelihood of good and bad events. I begin with a brief literature review specific to the hypothesis, which will test whether people optimistically ignore feelings of fluency when thinking about bad events (i.e., easily and clearly imagining them), which allows people to be untroubled by the prospect of an unpleasant future. I then describe 5 studies that provide supportive evidence. The first 2 studies establish the effect by asking participants to think about good and bad events that either occurred during the preceding year or that might occur during the following year. In this way, I show that the pattern is specific to people’s perceptions of the future, and does not reflect an effect of time or distance more broadly. The final studies further confirm that the pattern generalizes across multiple measures (Study 3), does not generalize to estimates of peers (Study 4), and is indeed driven by perceived likelihood (Study 5)—all in line with standard accounts of optimism. Thus, positive futures persist because people discount cues that forewarn of negative events.

The second route is internal, in that it examines how people optimistically perceive changes over time in their own mental states. After a brief review of research into how people think about identity, development, and change, I provide evidence from 6 studies demonstrating that people perceive their future selves as possessing superior mental capacities (e.g., self-control, rational thought) as compared to their past and present selves; hence, even if bad events were to occur, people believe that their future selves will be better equipped to handle them. The first 3 studies establish this effect at the self-report level by asking participants to describe their past and future abilities via open-ended essays (Study 1) and on fixed scales (Studies 2-3). As also shown in the “internal” studies above, I then confirm that the pattern is specific to thinking about the self and does not emerge when people think about change in peers (Study 4). The final studies highlight consequences for judgment and behavior in the present (Studies 5-6).

Throughout this dissertation, each chapter that corresponds to the internal and external routes ends by outlining direct follow-up studies for future work. In the chapter that follows, I more generally discuss how the findings fit in and add to the existing state of optimism research, and how they can help make predictions about *when* perceiving a positive future should help versus hurt. Finally, I return to James and use my work as a springboard from which to promote time as a core construct in mental and social life.

## CHAPTER II

### Evidence from the Perception of External Events

This chapter is adapted from my original paper “Easy to Retrieve but Hard to Believe: Metacognitive Discounting of the Unpleasantly Possible” (O’Brien, 2013):

How happy were you last year? How much happiness might next year bring? Such questions invite people to recall or imagine events in their lives that contain joy and pleasure, sorrow and sadness. Traditional theories of evaluative judgment (e.g., Higgins, 1996; Wyer & Srull, 1989) assume that people who generate many thoughts of positive events should feel happier than those who generate few, and people who generate many thoughts of negative events should feel unhappier than those who generate few. However, thinking about one’s life not only involves thought content but also the phenomenological experience of bringing thoughts to mind, in particular how easily they are processed and retrieved. Accordingly, people’s metacognitive experience of ease (“fluency”) may lead them to perceive more or less happiness when pleasant and unpleasant moments feel easy to imagine (Alter & Oppenheimer, 2009; Schwarz, 2004; Tversky & Kahneman, 1973; Winkielman & Schwarz, 2001). For example, if negative events from last year come easily to mind, people could infer that they must not have been very happy after all—even if, paradoxically, they recall only a handful of unpleasant memories.

At the same time, although the past is affectively mixed such that both good and bad events are easily accessible (Newby-Clark & Ross, 2003), our expectations about the

future tend to be far less diluted by negative thoughts. Rather, most of us are pervasively optimistic that things will go right, that tomorrow promises greener pastures and sunnier circumstances (e.g., see Schacter & Addis, 2007; Sharot, 2012; Weinstein, 1980). In its extreme form, this bias can of course lead to problematic misperceptions of one's own skill and status (Moore & Healy, 2008). In general, however, people's natural tendencies to assume positive, desirable, and successful outcomes prove quite useful for navigating everyday life—whether by helping us literally get out of bed (“Will I safely arrive at the office?”) or inspiring us toward broader goals (“Will my effort pay off down the road?”).

For these reasons, it is perhaps unsurprising that perceptions of the future tend to be dominated by pleasant (versus unpleasant) expectations; our normative orientation is to assume positive outcomes unless we find reason to believe otherwise (e.g., Chambers & Windschitl, 2004; Lench & Ditto, 2008; Taylor & Brown, 1988). Two pilot surveys confirmed this view (participants in these two surveys and in all studies that follow were recruited online via Amazon's Mechanical Turk; recruitment is not discussed further).

In the first survey, 50 online participants ( $M_{\text{age}} = 34.36$ ; 40% women) were asked to rate what percentage of their thoughts on an average day contain positive, negative, and neutral content. As predicted, participants reported that they thought about positive content far more frequently ( $M = 43.80\%$ ) than negative ( $M = 27.02\%$ ) or neutral ( $M = 29.18\%$ ) content. Moreover, they explicitly described their *future*-oriented thoughts by choosing whether they tend to “assume most things will go right” or “assume most things will go wrong” in their lives. A majority (74%) expected their futures to go well.

The second survey expanded upon this observation by recruiting a new sample of 50 participants ( $M_{\text{age}} = 27.50$ ; 30% women) to specifically forecast if their lives next year

would contain (A) only positive events, (B) mostly positive events and some negative events, (C) equal occurrences of positive and negative events, (D) mostly negative events and some positive events, or (E) only negative events. As expected, most (60%) chose B. In a similar vein, when these participants were asked to choose whether they were more focused on “attaining happy moments” or “avoiding unhappy moments” next year, most (88%) chose the former. Together, these pilot data confirm that people tend to think about their future lives in positive terms: most of us expect things to go well (not poorly), and that tomorrow promises many more happy experiences than unhappy experiences.

Thus, people hold preexisting beliefs about what their emotional futures might be like, in contrast to their pasts that necessarily include both good and bad moments. In terms of fluency, this distinction suggests that although recalling both happy and sad *past* events might be susceptible to metacognitive assimilation, an interesting valence-specific departure could emerge for *future* events once people’s initial assumptions are met with conflicting metacognitive cues. Namely, imagining positive futures should be susceptible to fluency, but its effect may be eliminated when thinking about negative futures. Indeed, people who struggle to generate positive forecasts may find reason to feel worse—after all, people are accustomed to thinking about the future in positive terms, and we naturally expect that many good events will occur. Hence, the salient act of trying (and failing) to generate pleasant possibilities might seem like a telling sign that something is “wrong.” Accordingly, people could infer future unhappiness in line with fluency effects. By the same logic, however, easily imagining negative events need not sound the alarm—after all, most of us rarely think about the future in negative terms, and we expect that negative outcomes are highly unlikely. Hence, generated images of an unhappy future could seem

undiagnostic or uninformative about more “realistic” future states. In line with this view, people may *discount* their metacognitive experience: they may be no more likely to infer future unhappiness when unpleasant futures feel easy (versus difficult) to think about.

Five studies tested these possibilities by asking participants to generate happy or unhappy events from the preceding or upcoming year, and comparing ease of retrieval with global assessments of wellbeing. Based on previous findings, it was predicted that fluency would indeed influence people’s perceptions of happy pasts, happy futures, and unhappy pasts; however, its effect might be eliminated when imagining unhappy futures.

### Study 1

Study 1 directly examined the effects of fluency on perceptions of past and future wellbeing via a correlational design.

**Method.** In a 2 (time: past or future) x 2 (valence: happy or unhappy) between-subjects design, 389 participants ( $M_{\text{age}} = 33.31$ ; 72% women) were asked to generate lists of 8 personal experiences from “last year” or “next year” that made or would make them happy or unhappy. In this and all studies, participants were recruited near the middle of the calendar year, which accounts for the possibility that “last year” was at a farther or closer distance than “next year.” Then, participants rated how difficult the experiences were to generate and how happy they were or would be overall (1 = *not at all*, 10 = *very*).

**Results.** Data were submitted to bivariate correlational analyses. Consistent with fluency effects, the easier it was to generate positive past experiences, the happier people thought they used to be,  $r = -.49, p < .001$ , and the easier it was to generate negative past experiences, the unhappier people thought they used to be,  $r = .36, p = .001$ . But this was

*not* the case for future events, marking the critical departure. The easier it was to generate positive future experiences, the happier people thought they would be,  $r = -.26, p = .009$ , as expected. However, there was *no relationship* between easily imagining negative futures and overall judgments of future emotional states,  $r = -.07, p = .52$ . These findings provide support for the hypothesis: global perceptions of past and future happiness were strongly associated with the ease of retrieving good and bad events—*except* when people tried to imagine unhappy futures.

## Study 2

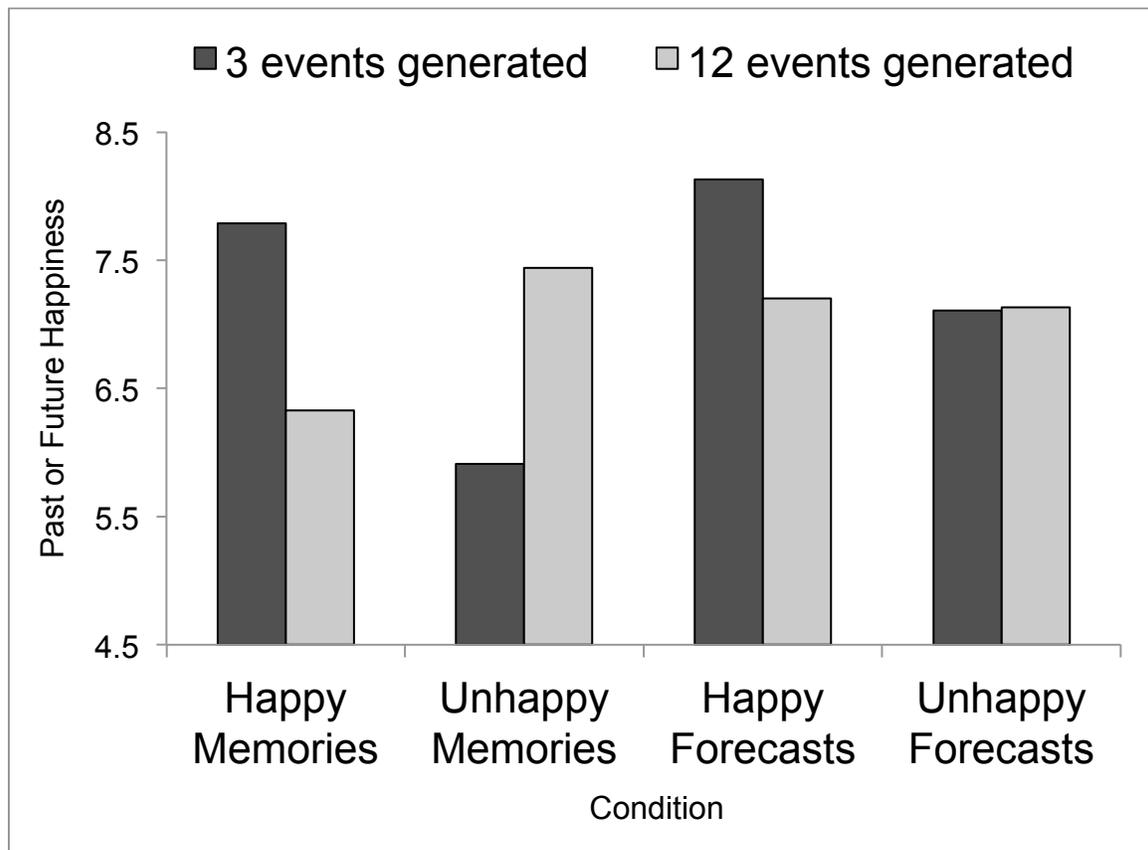
Study 2 sought to replicate the patterns observed in the prior study in a fully-randomized experiment by manipulating fluency (adapted from Schwarz et al., 1991).

**Method.** In a 2 (time: past or future) x 2 (valence: happy or unhappy) x 2 (fluency: easy or difficult) between-subjects design, 180 participants ( $M_{\text{age}} = 32.97$ ; 54% women) were asked to list either 3 (easy task) or 12 (difficult task) happy or unhappy personal experiences from last or next year, then answered the questions from Study 1.

**Results.** Data were submitted to MANOVA analyses, with ratings of difficulty and overall happiness serving as dependent variables, and time, valence, and fluency conditions serving as the independent variables. Validating the fluency manipulation, 12 experiences were indeed harder to generate ( $M = 6.14$ ) than 3 experiences ( $M = 3.52$ ),  $p < .001$ . More important, global assessments were qualified by the predicted 3-way interaction,  $F(1, 179) = 3.96, p = .048$  (see Figure 1). Ironically, people who recalled only 3 positive past events remembered being happier overall ( $M = 7.79, SD = 1.25$ ) than people who recalled 12 positive past events ( $M = 6.33, SD = 2.26$ ),  $p = .009$ , but people

who recalled 12 negative past events remembered being happier overall ( $M = 7.44$ ,  $SD = 1.50$ ) than people who recalled only 3 negative past events ( $M = 5.91$ ,  $SD = 1.98$ ),  $p = .01$ . Moreover, the same critical departure emerged: although listing 3 positive future events led people to imagine being happier overall ( $M = 8.13$ ,  $SD = .85$ ) than listing 12 positive future events ( $M = 7.20$ ,  $SD = 1.40$ ),  $p = .01$ , people predicted equal happiness regardless of listing 3 ( $M = 7.11$ ,  $SD = 1.85$ ) or 12 ( $M = 7.13$ ,  $SD = 2.11$ ) negative future events,  $p = .97$ . These findings replicate those of Study 1 with a fully randomized design.

**Figure 1.** Mean ratings of past or future happiness as a function of condition and the number of events that participants were asked to generate. Conditions were defined by whether participants were instructed to remember or predict happy or unhappy events. As can be seen, fluency had its predicted effect in all conditions but Unhappy Forecasts.



Having established the general effects of fluency on people's perceptions of wellbeing over time, Studies 3-5 sought to further unpack its unique (null) effect on future unhappiness. First, does the departure remain when using more diverse measures of wellbeing (Study 3)? Second, given the well-established connection between traditional optimism biases and motivated reasoning, does the departure contain a motivational component (Study 4)? Third, is the effect indeed mediated by people's perceptions of how likely good and bad events are to actually occur (Study 5)?

### Study 3

Studies 1-2 are restricted to a single-item measure of happiness, but many studies of wellbeing employ multi-dimensional measures. Study 3 sought to address this concern.

**Method.** In a between-subjects correlational design, 51 participants ( $M_{\text{age}} = 29.24$ ; 61% women) were asked to generate lists of 8 happy or unhappy personal experiences that could occur next year and also rated how difficult they were to generate (1 = *not at all*, 10 = *very*). Participants then completed 2 wellbeing scales. First, they completed the 5 future-related items from the well-established Temporal Satisfaction with Life Scale (e.g., "The conditions of my life next year will be excellent": Pavot, Diener, & Suh, 1998), which were rated on scales from 1 (*strongly disagree*) to 7 (*strongly agree*). Second, participants completed 5 global assessments of future wellbeing: how *happy* and *satisfied* they will be next year, how much they will *enjoy* next year, how much *fun* they will have, and how *positive* they will feel, rated on scales from 1 (*not at all*) to 10 (*very*).

**Results.** Data were submitted to bivariate correlational analyses. Items from the Temporal Satisfaction with Life Scale were collapsed into a composite index of

prospective satisfaction ( $\alpha = .89$ ), and global items were collapsed into a composite index of prospective happiness ( $\alpha = .97$ ). As expected, the easier it was to generate positive future experiences, the more satisfied ( $r = -.42, p = .028$ ) and happier ( $r = -.51, p = .006$ ) people thought they would be overall. However, as in prior studies, there was *no relationship* between easily imagining negative futures and overall predicted satisfaction ( $r = .14, p = .50$ ) or overall predicted happiness ( $r = .12, p = .59$ ). These results extend the patterns from Studies 1-2 beyond a single-item wellbeing measure.

#### Study 4

As outlined in this chapter's introduction, most people naturally expect their futures to contain many more happy moments than unhappy moments. A large literature suggests such optimistic perceptions stem from motivated reasoning: people are biased to expect mostly good outcomes as a means to enhance mood, maintain self-esteem, and impel behavior (see Kunda, 1990; Sharot, 2012; Taylor & Brown, 1988). Accordingly, research shows that people only necessarily believe that *their own* futures will be bright (for a review see Chambers & Windschitl, 2004). In other words, although Studies 1-3 suggest people discount personal negative futures, people who easily imagine *someone else's* negative future should still be affected by fluency if, as presumed, the departure is rooted in these well-established optimistic expectations. Study 4 tested this possibility.

**Method.** In a between-subjects correlational design, 80 participants ( $M_{\text{age}} = 31.45$ ; 49% women) completed a survey about how people think about their friends. On the opening screen, they were asked to indicate the name of a close friend whom they knew much about, which restricted judgments to highly familiar others (people are

affected by fluency differently when thinking about familiar versus unfamiliar targets: Caruso, 2008). Next, participants were asked to list 8 experiences that might make their friend happy or unhappy during the upcoming year, and rated how difficult they were to generate (1 = *not at all*, 10 = *very*). Then, they completed adapted versions of the measures used in Study 3: the Temporal Satisfaction with Life Scale (e.g., “The conditions of my friend’s life next year will be excellent”:  $\alpha = .82$ ) and the 5-item wellbeing scale (e.g., “How happy will your friend be next year?”:  $\alpha = .96$ ).

**Results.** Data were submitted to bivariate correlational analyses. Again, the easier it was to generate positive future experiences, the more satisfied ( $r = -.28, p = .069$ ) and happier ( $r = -.35, p = .021$ ) people thought their friend would be overall. However, unlike previous studies, this pattern *remained* for negative forecasts: the easier it was to generate negative future experiences, the less satisfied ( $r = .38, p = .022$ ) and less happy ( $r = .36, p = .03$ ) people thought their friend would be. This finding is important for integrating Studies 1-3 into traditional optimism accounts. The act of imagining negative events itself cannot account for the null effect of fluency; rather, the *target* of those negative forecasts predicts whether fluency has an effect (generating for others) or whether it is discounted (generating for the self). Thus, Study 4 corroborates the proposition that this departure reflects people’s optimistic expectations of *their own* futures. The next study sought to establish direct evidence for this process.

## Study 5

A final question pertains to specific reasons for why people discount feelings of fluency when generating negative (but not positive) forecasts. As proposed, the departure

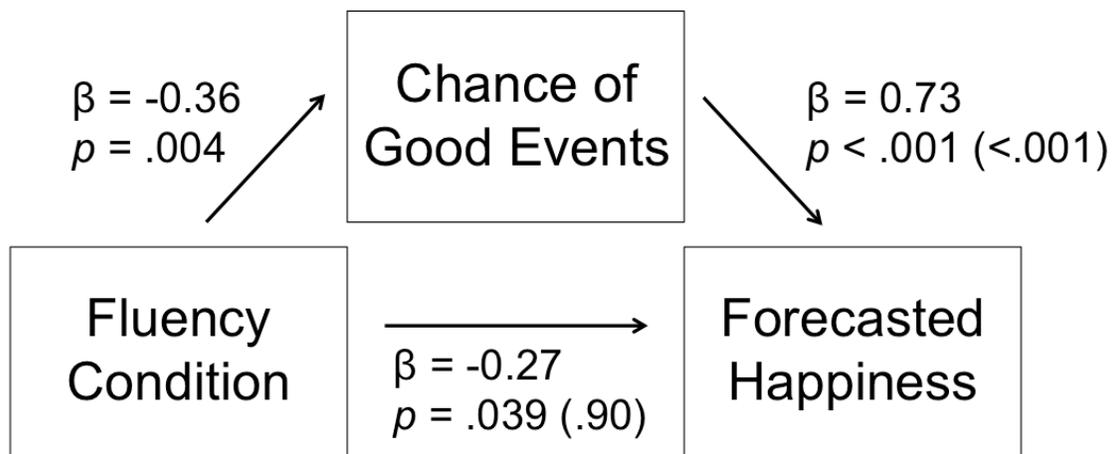
should depend on people's expectations that good events are much more likely to happen to them than bad events. Because we expect many happy events to occur, the salient act of struggling to imagine happy moments may decrease their perceived likelihood, leading to lower predicted happiness. On the other hand, easily imagining unhappy events need not sound the alarm if we naturally assume they are highly unlikely. Study 5 explored whether perceived likelihood indeed mediates the effect of fluency on global perceptions.

**Method.** In a 2 (valence: positive or negative) x 2 (fluency: easy or difficult) between-subjects design, 196 participants were invited to take a survey about their own upcoming summer vacations. On the opening screen, 25 subjects admitted they had no vacation plans and were removed. Thus, 171 real vacationers ( $M_{\text{age}} = 29.43$ ; 46% women) generated 3 or 12 “positive things that could go right” or “negative things that could go wrong” on their trip. As a pure manipulation check, they indicated whether this list was “generally difficult” or “generally easy” to fill (people with inconsistent responses were eliminated for a more explicit test of the hypothesis). For dependent measures, subjects completed the (modified) 5-item global wellbeing scale from Studies 3-4 (e.g., “How happy will you be on this vacation?”:  $\alpha = .96$ ), counterbalanced with the question: “What are the chances that many things will go right [wrong] on this vacation?” (0% to 100%).

**Results.** Data were submitted to MANOVA analyses, with ratings of difficulty and overall happiness serving as dependent variables, and valence and fluency conditions serving as the independent variables. Prospective happiness was indeed qualified by the predicted interaction,  $F(1, 117) = 4.51, p = .036$ . People who listed only 3 positive events predicted that they would be happier on the vacation ( $M = 8.95, SD = 1.28$ ) than those who listed 12 positive events ( $M = 8.20, SD = 1.14$ ),  $p = .034$ . Similarly, participants

believed the chance that many things would go right on the vacation was less likely after they listed 12 positive events ( $M = 73.76\%$ ,  $SD = 14.60\%$ ) than after they listed 3 positive events ( $M = 84.54\%$ ,  $SD = 11.77\%$ ),  $p = .008$ . In turn, and in line with the theoretical framework, perceptions of the chance of good events actually occurring on vacation fully mediated the effect of fluency on forecasted trip wellbeing (Hayes, 2012: 95% bootstrap confidence interval = [-1.42, -0.22], which excludes the value 0; see also Figure 2).

**Figure 2.** Multiple regression mediation model (Baron & Kenny, 1986) showing the influence of fluency condition (easy or difficult) on forecasted happiness on vacation, as influenced by perceptions of how likely it was that good events would occur. The  $p$ s in parentheses show the strength of the path between two variables when the third variable is controlled for.



Importantly, however, people expected equal happiness regardless of whether they listed 3 ( $M = 8.75$ ,  $SD = 1.23$ ) or 12 ( $M = 9.02$ ,  $SD = 1.11$ ) negative events,  $p = .42$ . Accordingly, bad vacation experiences seemed *just as unlikely* after participants listed 3 negative events ( $M = 22.14\%$ ,  $SD = 16.08\%$ ) as after they listed 12 negative events ( $M =$

16.50%,  $SD = 12.85\%$ ),  $p = .14$ . Thus, the discounting effect may be explained by a difference in the perception of good and bad experiences actually occurring.

### Chapter Discussion

These findings appear to be clear in cause and rich in consequence. First, how happy people think they were or will be is strongly shaped by incidental metacognitive cues. Paradoxically, happiness seems to be maximized when people generate *few* pleasant memories or forecasts—not many—because struggling to generate positive moments leads people to infer less positive lives. This observation is critical for marketers, policy-makers, and everyday people alike, who often endorse opposite strategies for enhancing wellbeing (e.g., promoting the belief that more happiness in quantity yields more happiness in quality: see Oishi, Diener, & Lucas, 2007).

Second, this effect is eliminated when imagining negative futures, because people expect that few negative experiences are just as unlikely to occur as many. This finding reveals important boundaries to the axiom that fluently-processed information represents “real” information, that thoughts which easily come to mind are perceived as believable, accurate, and true (Alter & Oppenheimer, 2009; Begg, Anas, & Farinacci, 1992; Brennan & Williams, 1995; Dechêne, Stahl, Hansen, & Wänke, 2010; Hilbig, 2012; Kelley & Lindsay, 1993; McGlone & Tofiqbakhsh, 2000; Reber & Schwarz, 1999). People who easily imagined negative future experiences were no more inclined to believe that they would be unhappy, stubbornly insisting upon the same pleasant tomorrow as people who *struggled* to imagine negative future experiences. Thus, metacognitive states themselves can apparently feel “wrong”, which are not brought to bear on our subsequent judgments

and perceptions. These results indicate that people may “tune out” their metacognitive voices depending on the valence and content of their thoughts, in addition to their preexisting expectations, beliefs, and motives.

**Theoretical Extensions.** The observation above complements past work showing that people are less influenced by fluency when thinking about unfamiliar others, because they infer that their fluent or disfluent state reflects a lack of private knowledge rather than something meaningful about the target (Caruso, 2008). Generally speaking, people might be unswayed when metacognitive feelings are perceived as *undiagnostic* about the content domain—which may help explain why fluency seems to lose its power when people think about unfamiliar targets and when the thinking experience itself feels unfamiliar or unnatural (e.g., trying to generate negative forecasts or to imagine negative futures rather than engaging in our normative orientation toward the positive). Ironically, generating downsides of an upcoming positive event could yield just as much excitement as generating some upsides—and *more* excitement than imagining many upsides.

This valence-specific asymmetry reveals novel and nuanced phenomenology underlying how people think about the future. In one sense, the fluent experience of easily imagining negative futures could have led people to increase their estimates of the likelihood of bad events and thus infer future unhappiness in line with standard fluency effects. But this was not the case. Rather, ease of retrieval was apparently not powerful enough to nudge participants away from their preexisting expectations, consistent with a huge number of prior attempts (and subsequent failures) to change people’s pervasively optimistic beliefs about the unlikelihood of personally experiencing negative events (see Moore & Healy, 2008, for a review). Note, however, that the very nature of such biases—

our natural orientation toward the positive and our expectation that the future promises many more happy experiences than unhappy experiences—may present a double-edged sword for maintaining rosy outlooks once we are faced with reason to believe otherwise:

On the one hand, people expect that bad experiences are highly unlikely, which helps us stay hopeful in the face of unpleasant prospects. Moreover, even if participants were asked to think of highly probable negative events, they still might be comforted by their perception that *most* future events will nonetheless be positive. On the other hand, precisely because we expect that good experiences are highly likely, optimistic beliefs can be readily challenged by the *lack* of pleasant prospects. Indeed, people who struggle to imagine positive events seem to be left with nowhere else to turn. Paradoxically, then, the *same* beliefs and expectations that lead people to initially assume brighter tomorrows can serve as a metacognitive blessing when thinking about unhappy future experiences but a metacognitive curse when thinking about happy future experiences.

**Future Directions.** This valence-driven distinction in future-oriented thinking may lead to important differential consequences. One avenue for follow-up research might explore people’s (non)-reliance on metacognitive cues for different types of content. Thinking about the hypothetical future is often just as constrained by reality as thinking about the actual past (see Johnson & Sherman, 1990; Ross & Buehler, 2004)—in these situations, one could expect similar patterns as the current studies. However, it seems less intuitive to rely on metacognitive cues when sampling from a potentially infinite or impossible population of future experiences; although “next year” and “next vacation” are relatively defined and realistic, easily daydreaming about hitting game-winning home runs should not lead people to infer that they have better chances of

playing professional baseball for the Philadelphia Phillies. Nonetheless, the fact that “happy future” participants *were* sensitive to metacognitive cues suggests that people can be influenced by fluency not only when generating “literal” thought content.

A related avenue should extend these principles beyond the temporal domain. If a negative future generally represents something that people tend not to think about or do not naturally expect, then similarly “hard to believe” content should also be discounted. For example, if unfavorable reviews of a desired product or unwelcome news stories of a preferred political candidate come easily to mind, people might be uninfluenced their experience of ease and stubbornly maintain their original opinions. Future work should fruitfully explore this possibility, as well as its problematic implications. Indeed, in some situations our sense of ease probably *should* signal a need to adapt our opinions, choices, or judgments, particularly in the case of easily imagining potential problems in our lives (e.g., thinking about future experiences that could very well make us unhappy).

**Summary.** Ultimately, the current studies help expose some of the phenomenological foundations underlying people’s potentially misguided thought processes and misperceptions of wellbeing in everyday life, and thus suggest important topics for research. In doing so, they shed light on and raise new questions about how people perceive their well-being over time. More broadly, they reveal the need for a better understanding of when otherwise strong subjective experiences do not influence judgment—perhaps when more pleasant beliefs and biases prove to be more satisfying.

## CHAPTER III

### Evidence from the Perception of Internal Change

This chapter is adapted from my original paper “Emotional Pasts and Rational Futures: The Mind Perception of Self Over Time” (O’Brien, 2014):

People regularly ascribe mental capacities to friends, pets, and spirits despite the fact that mental states beyond one’s own immediate experience cannot be seen or felt in any tangible sense. Others’ intentions, thoughts, and feelings are necessarily *perceived*, and people’s penchant for perceiving other minds is one of nature’s finest and most frequently utilized gifts (Epley, Akalis, Waytz, & Cacioppo, 2008; Gray, Young, & Waytz, 2012). Less well understood, however, is how people perceive *their own* mental states beyond the here and now, namely, in the past and future. To the extent that mental representations of past and future selves bear resemblance to other people (Pronin & Ross, 2006), processes underlying mental inference across space (e.g., from *me* to *you*) might extend across time and tense (e.g., *me 10 years ago* to *me now* to *me in 10 years*).

Building on a two-dimensional model of mind perception (Gray, Gray, & Wegner, 2007) that distinguishes between “experience” (e.g., emotional capacity, body sensitivity) versus “agency” (e.g., cognition, rationality), 6 experiments reveal that people indeed ascribe mental capacities to past and future selves but appear to redistribute these capacities over time, demonstrating a robust temporal asymmetry in perceiving one’s

own mental states. How much emotional experience and rational agency people see in themselves depends on whether they are looking back to the past or ahead to the future.

### **Perceiving Other Minds**

Social psychology enjoys a rich tradition of exploring the mental processes and intergroup dynamics that underlie how people interpret others' thoughts and actions (Gilbert & Malone, 1995; Jones & Harris, 1967; Ross & Nisbett, 1991; Swann, 1984). One recent instantiation of this literature has emerged under the diverse scope of mind perception. *Mind perception* might generally be defined as the psychological process of attributing, inferring, and interpreting others' internal states that otherwise cannot be observed or accessed directly with one's own senses, such as others' thoughts, feelings, intentions, goals, desires, and consciousness (Baron-Cohen, 1994; Morewedge, Preston, & Wegner, 2007; Premack & Woodruff, 1978). Despite obvious difficulty in establishing proof that such states objectively exist, people's tendency to perceive minds in the world is nonetheless pervasive and well-documented across social psychology, philosophy, and cognitive sciences (e.g., Bain, Vaes, Haslam, Kashima, & Guan, 2012; Dennett, 1996; Galinsky & Moskowitz, 2000; Gopnik & Wellman, 1992; Gray et al., 2007; Knobe & Prinz, 2008; Hassin, Aarts, & Ferguson, 2005; see Epley & Waytz, 2009, for a review).

Indeed, minds seem to be all around. People perceive other minds spontaneously with little or no conscious effort (Hassin, Bargh, & Uleman, 2005), not only in other people but also in gods and spirits (Barrett, 2000), in cars and other cherished material possessions (Chandler & Schwarz, 2010), in large corporations like McDonalds or Walmart (Waytz & Young, 2011), in entitative groups (Morewedge, Chandler, Smith,

Schwarz, & Schooler, 2013), and even in inanimate objects like rocks and computers (Waytz, Cacioppo, & Epley, 2010). Not surprisingly, then, the ability to perceive other minds is implicated in many important psychological processes, including perspective taking and empathy (Epley, Caruso, & Bazerman, 2006; Hodges & Wegner, 1997), the development of “theory of mind” beliefs (Baron-Cohen, 1994; Gopnik, 2010), emotion detection (Ekman, Friesen, & Ellsworth, 1972), the dehumanization of outgroup others (Haslam, 2006), and moral reasoning (Ditto, 2006; Gray et al., 2012).

### **Two Dimensions**

Insight into the nature of mind perception can be traced back long before contemporary research, rooted in classical Greek philosophy. In a famous treatise, Aristotle (350 BCE) defined mind as “the part of the soul by which it knows and understands” and argued that people’s possession of a mind imbued them with reason, which he claimed was alone sufficient for establishing more accurate self-knowledge and a better understanding of the thoughts and intentions of others (*De Anima*, 429a9-10).

While modern scholars might not fully disagree with an Aristotelian view of the mind, they likely would find it somewhat incomplete. Recent empirical research in psychology suggests people perceive other minds not along a single dimension but along two: what might best be labeled as a dimension of agency and a dimension of experience (Gray et al., 2007). *Agency* is associated with rational thought and refers to people’s tendency to ascribe cognitive skills to others, such as their abilities to exert self-control, make plans, and act morally. *Experience* is associated with emotionality and refers to people’s tendency to ascribe affective sensitivities to others, such as their capacities to

feel pain and joy. Some targets are attributed high agency and low experience (e.g., gods), others high experience and low agency (e.g., pets), and still others high agency and high experience (e.g., adult humans) or low scores on both dimensions (e.g., cadavers).

The agency/experience bifurcation maps closely onto distinctions that have been made in similar lines of research, particularly competence/warmth models of stereotyping (Fiske, Cuddy, Glick, & Xu, 2002), cold/warm models of person perception (Asch, 1946; Kelly, 1950), and dominance/nurturance models of personality judgments (Wiggins & Broughton, 1991). While Aristotle rightly emphasized the rational mind, his quote above seems to have missed an equivalent importance of the emotional mind, as highlighted by these varied literatures. People ascribe mental capacities to others along *two* dimensions, not one. Perhaps Descartes (1646) was more apt, who wrote in many years after Aristotle: "By the word 'thought' I understand everything we are conscious of as operating in us. And that is why not only understanding, willing, imagining, but also feeling, are here the same thing as thinking" (*Principles of Philosophy*, 1-9).

### **The Self as an Other**

Until this point, mind perception has been discussed in terms of people's tendency to attribute rationality and emotionality to *other* people, objects, and entities. However, because the assumed process is generally rooted in how people come to understand the world beyond the immediate senses, it seems reasonable to examine how people might perceive *their own* minds over time. Indeed, present moments are strikingly brief. As Kahneman and Riis (2005) poignantly note, "The experiencing self that lives each of these moments barely has time to exist" (p. 285). Thus, like the internal states of others,

our own lives before and after that vanishing window of experience lack any tangible qualities and thus are necessarily perceived and inferred (Robinson & Clore, 2002).

Interestingly, prior research suggests that people often perceive their past and future selves from a third-person perspective, as if they were looking at someone else (Cohen & Gunz, 2002; Frank & Gilovich, 1989; Libby & Eibach, 2002; Lorenz & Neisser, 1985; Nigro & Neisser, 1983; Pronin, Olivola, & Kennedy, 2008; Pronin & Ross, 2006). Moreover, people seem to *treat* their past and future selves as if they were other people (Lieberman, Trope, & Stephan, 2007), in that they choose smaller immediate rewards instead of larger rewards in the future (Frederick, Loewenstein, & O'Donoghue, 2003), delay undesirable experiences now at the expense of doing them later (Ainslie & Haslam, 1992), and assign the same amounts of rewards and punishments to future selves as they assign to present others (Pronin et al., 2008). Even at a neuropsychological level, thinking about one's own experiences across time (e.g., retrospection and prospection) and about others' experiences across space (e.g., theory of mind, perspective taking) may activate a shared brain network, which may suggest that people process and represent their past and future selves as if those selves were literally other people (Buckner & Carroll, 2006; Ochsner et al., 2004; Pronin, 2008; Saxe & Kanwisher, 2003).

Thus, people's perceptions of their own mental states over time might closely parallel their perceptions of mental states in others. Given the predominant two-dimensional model of perceiving others' minds, one intriguing but yet untested question is how people might ascribe agency and experience to their own past and future selves, and if there are any systematic differences in these ascriptions as a function of tense.

## Minds in Time

How might people perceive the minds of their past and future selves? On the one hand, people may ascribe greater agency *and* greater experience to their future selves compared to their past or present selves. People tend to construct idealized versions of their futures (Higgins, 1987; Levinson, 1978), which can help us maintain self-esteem (Maslow, 1970), promote confidence (Sedikides & Skowronski, 2000), and subdue negative moods (Taylor & Brown, 1988), as well as motivate present action and goal-pursuit (Markus & Nurius, 1986; Taylor & Gollwitzer, 1995). The overarching view in this literature suggests that people tend to perceive the future as uniformly bigger, better, and “more” than yesterday or today. For example, most of us assume that our personal futures promise more opportunities, more purpose, more time, and more “refined” knowledge, opinions, and perspectives (Albert, 1977; Easterlin, 2001; Newby Clark & Ross, 2003; Ross & Newby-Clark, 1998; Wilson & Ross, 2003; Pavot, Diener, & Suh, 1998; Sedikides & Hepper, 2009). “The past is prologue,” a popular saying goes, “...the future is everything.” In line with this view, people might perceive their future selves as exhibiting more agency (e.g., rational thought) and more experience (e.g., emotions).

On the other hand, the two-dimensional framework of mind perception affords a more nuanced interpretation of this literature, which turns out to focus almost exclusively on agency-related traits. People may believe that their futures will be bigger and better—to the extent that they perceive increases in mastery (Taylor, 1983), willpower (Helzer & Gilovich, 2012), competency and efficacy (Bandura, 1982), goal achievement (Johnson, 2009), autonomy (Ryff, 1991), and self-control (Ferrante, Giroto, Stragà, & Walsh, 2013; Williams & LaBoeuf, 2014), as well as corresponding decreases in susceptibility to

situational influences (Griffin, Dunning, & Ross, 1990), bad luck (Landau & Chisholm, 1995), and immaturity (Robins, Nofle, Trzesniewski, & Roberts, 2005). Even one of the most influential existing frameworks, Wilson and Ross's (2001) temporal self-appraisal theory, posits that people perceive their "positive traits" as constantly rising over time—but nearly all the traits that reportedly rise are also specifically associated with agency (e.g., independence, self-reliance, seriousness about school, self-motivation).

In terms of mind perception, past selves might indeed be ascribed less agency than the present and future selves more, consistent with these findings. But importantly, contrary to the generalized conclusion that the future is always "more" or "bigger," there is reason to predict that ascriptions of *experience* may not follow the same pattern, and might sometimes even be greater for *past selves* than for future selves.

### **Emotional Pasts and Rational Futures?**

Although attributions of agency and experience are traditionally thought to be orthogonal such that targets can be independently attributed varying levels of each, situations that allow for explicit comparisons between the two often result in a dynamic interplay of yin-and-yang, in which having a capacity for one can negate capacities for the other (Bloom, 2004; Gray, Knobe, Sheskin, Bloom, & Barrett, 2012; Kervyn, Yzerbyt, Judd, & Nunes, 2009). Based on this dualistic property of mind perception, people "...have a tendency to view someone as capable of *either* agency *or* experience, either as someone capable of thinking or as someone capable of feeling" (Gray et al., 2012, p. 2, emphasis in original). For example, the less a given target is described in experiential terms (e.g., a character who is born 'genetically insensitive' to pain), the

more agency people attribute to the target (e.g., the character is perceived as more responsible than others for a group crime: Gray & Wegner, 2009). This compensatory relationship is further demonstrated in the stereotyping literature, for instance, in people's disinclination to attribute warmth to targets that have already been strongly stereotyped as competent, or vice versa (Fiske, Cuddy, & Glick, 2007). Thus, based on the previously described research suggesting that attributions of agency may exhibit a strong linear pattern with past selves having much less and future selves having much more, it follows that ascriptions of experience could simply reflect the opposite: people may perceive non-agentic (but experiential) past selves and agentic (but non-experiential) future selves.

There are a number of possible reasons to predict this asymmetric split between “past = emotional” and “future = rational.” Four feasible possibilities are discussed here, each of which likely contribute to varying degrees across different judgment contexts.

First, people's temporal perceptions may sometimes simply be correct. It is well documented that people at younger life stages (e.g., adolescent youth) are prototypically more emotional and less rational than their older counterparts (e.g., middle aged adults; see Damon & Eisenberg, 1998; Green, Fry, & Myerson, 1994; O'Brien, under review). Thus, to the extent that people evaluate past selves who are closer to youth and future selves who are closer to adulthood, the hypothesized asymmetry should be observed. I attempt to disentangle this issue by focusing mainly on short time frames, such that no actual “changes” should develop (e.g., rating one's past and future self across 1 year). Nonetheless, given that these components are inherently inseparable (it is impossible to imagine one's past or future self without simultaneously seeing oneself as younger or older), actual age is likely a driving mechanism across a number of real-world contexts.

Second and in a similar vein, people may overextend these beliefs about age and maturation for more “motivated” reasons. In other words, even if no actual development occurs across a given time frame, people may bring to bear prototypical notions of youth and adulthood onto past and future thinking. Indeed, going beyond actual age differences, people tend to believe that life moves *towards* something, that they learn and grow wiser over the course of their lives (Heckhausen & Krueger, 1993; Markus & Ruvolo, 1989; McAdams, 2006; Sedikides & Hepper, 2009). In line with this view, people may desire to perceive their time as progressing along a positive and rational route, even at the cost of judgment accuracy (Aspinwall, 2006; Burger, 1985; Seligman, Railton, Baumeister, & Sripada, 2013). If one’s future seems brighter than one’s past—and given the pervasive belief that being rational is superior to being emotional (see Haidt, 2001, for a historical discussion)—people may perceive changes in rationality and emotionality accordingly.

Third, these associations between “past = emotional” and “future = rational” may sometimes be less motivated and more rooted in core principles of cognitive accessibility, namely the focalistic tendency for people to attend to select bits of whatever information comes to mind (see Robinson & Clore, 2002; Schwarz, Kahneman, & Xu, 2009). On the one hand, no past is homogenous. All of us have met and not met goals, done things of which we are proud and ashamed, and been through highs and lows. Accordingly, we simply know more about the past than other points (Albert, 2000; Horwich, 1987), and so it is easier to remember than forecast events that are affectively-mixed (Newby-Clark & Ross, 2003), idiosyncratic (Kane, 2009), detailed (D’Argembeau & Van der Linden, 2004), and constrained by reality (Van Boven, Kane, & McGraw, 2009); after all, an actual variety of past experiences is easily accessible. In contrast, our tomorrows have yet

to occur, and people tend to paint personal futures that are decontextualized (Wilson & Gilbert, 2003), prototypic (Kane, Van Boven, & McGraw, 2012), controllable (Johnson & Sherman, 1990), and immune to outside influences (Kahneman & Lovallo, 1993). Thus, if people simply *can* recall the inevitable times when plans went awry and they were caught by emotional forces—but *fail* to predict the impact of these “hot” emotional states in the future—the hypothesized asymmetry in mind perception might be observed.

Fourth, there may be phenomenological differences between the act of thinking about past versus future moments that could contribute to an asymmetry. For example, retrospection often triggers more distant mindsets than prospection (Caruso, Van Boven, Chin, & Ward, 2013), and evokes less arousal (Van Boven & Ashworth, 2007). Many of these factors are accounted for in the current paper. In general, however, differences in the thought generation itself may further facilitate an asymmetric perception of mind.

### **Overview**

Six studies tested a temporal redistribution hypothesis in the mind perception of self: the possibility that past selves are ascribed strong emotional experience but weak rational agency, whereas people’s ascriptions of emotions and rationality are reversed when they think about equidistant points in the future. Studies 1-3 sought to establish these patterns by explicitly assessing how people perceive their past and future selves across a wide range of measures and parameters. In turn, Study 4 tested whether these results generalize to any type of past/future thinking (e.g., imagining how a friend might change over time), or if they are specific to the self. The final studies went beyond direct

ratings to explore downstream consequences of temporal redistribution for how people actually think (Study 5) and behave (Study 6) in the present.

Collectively, these studies were designed to highlight theoretical as well as practical insights into a number of psychological domains. Theoretically, they represent the first exploration of how the interpersonal agency/experience framework might extend to intrapersonal processes, mapping out the mind perception of past and future selves. In doing so, they not only help integrate many previous findings on intertemporal thinking (e.g., error versus accuracy in retrospection and prospection; identity and change over time; goal pursuit), but also suggest novel implications for how people's concepts of past and future selves may be able to influence their emotional and cognitive experiences in real time—for better and worse. Finally, the multiple candidate mechanisms are revisited in the Chapter Discussion, which further serve to integrate a number of literatures. It is worth noting that, despite various drivers, they all predict the same overarching pattern: past selves may be perceived as emotional experiencers, future selves as rational agents.

### **Study 1**

In the first 3 studies, participants were randomly assigned to recall the person they used to be or imagine the person they might become. A wide variety of methods were used across the studies, so to best test for converging patterns in how people perceive their past and future mental states. Study 1 avoided demand by asking participants to simply describe their past and future selves in a free writing session. In this way, people's initial associations for past and future mental states could be assessed. Details for Study 1 are provided below. As a complement to this experiment, Studies 2-3 then assessed fixed

ratings, and tested potential differences across distance by asking people to rate both distant selves (Study 2) and proximate selves (Study 3). Each study sought to employ different types of samples, methods, and dependent variables in order to establish the general patterns of how people perceive their own minds in time, above and beyond any particular phrasing or method. Below are the methods and results specifically for Study 1.

**Method.** In individual sessions, 38 people ( $M_{\text{age}} = 33.19$ ; 61% women) completed an online study via Amazon's Mechanical Turk. Participants were told that they would complete an open-ended, free-writing session in a study ostensibly about how people describe themselves. They were asked to write about what traits, characteristics, and tendencies come to mind when they think about their "past self" and "future self." The study design was within-subjects, such that all participants wrote about both selves one at a time in random order. They were asked to provide at least 5 full sentences for each description, and were not given any other specific instructions or details.

After compiling the writing samples into a single data file, a group of naïve research assistants stripped away all demographic information and past/future phrasing. For example, one representative "future" participant originally wrote: "My future self will seek to control life events as much as possible, rather than allowing them to control her." This phrase was rewritten as: "I seek to control life events as much as possible, rather than allowing them to control me." In other words, descriptions were translated in ways that made them unidentifiable as to whether the original participants had written about their past or future selves, while maintaining all descriptive language.

Then, these stripped descriptions were presented to a new sample from the same population (Amazon Turk:  $N = 52$ ;  $M_{\text{age}} = 29.37$ , 31% women) who served as raters. In a

mixed-block design, each rater was presented with a random selection of 8 descriptions. After reading each description, raters were asked to think about the person who wrote it and to indicate how emotional he or she might be (1 = *not at all of an emotional person*, 7 = *very much an emotional person*), how rational he or she might be (1 = *not at all of a rational person*, 7 = *very much a rational person*), and also to directly compare these dimensions (1 = *this is mostly an emotional person*, 7 = *this is mostly a rational person*). “Emotional” was defined as: “This person has a big capacity for feeling pleasure and pain, and has strong feelings; he/she is emotionally reactive and goes with his or her gut”. “Rational” was defined as: “This person has a big capacity for thought and planning, and has strong self-control; he/she is proactive and goes with his or her head”. It was also explicitly indicated that both definitions were meant to be equally desirable and important, in order to help reduce demand such that the raters automatically infer “emotional” to mean “bad” or “negative,” and “rational” to mean “good” or “positive.”

**Results.** To simplify the analyses, t-tests were conducted such that the past/future variable of the original sample was used to examine differences in raters’ fully naïve perceptions, which were treated as independent observations. As predicted, descriptions of past selves seemed like they were depicting much more emotional people ( $M = 5.05$ ,  $SD = 1.67$ ) than descriptions of future selves ( $M = 4.12$ ,  $SD = 1.64$ ),  $t(414) = 5.73$ ,  $p < .001$ . In contrast, descriptions of future selves seemed like they were depicting much more rational people ( $M = 5.30$ ,  $SD = 1.42$ ) than descriptions of past selves ( $M = 3.29$ ,  $SD = 1.56$ ),  $t(414) = -13.74$ ,  $p < .001$ . Moreover, regarding the direct comparison item, past selves were rated as *mostly* emotional ( $M = 3.26$ ,  $SD = 1.68$ ) and future selves were

rated as *mostly* rational ( $M = 4.84$ ,  $SD = 1.56$ ),  $t(414) = -9.97$ ,  $p < .001$ ;  $ps < .001$  when compared against the midpoint of the scale.

These findings provide initial support for the hypothesis: people spontaneously and naturally described their past selves as emotional and their future selves as rational. These patterns emerged within a design that largely avoided demand characteristics, both for the writers who were not given any specific prompts or timeframes for how to describe their other selves, and for the outside raters who were completely blind to the past/future variable. The next study sought to extend these findings by using a different population, new methods and measures, control variables, and a specified timeframe.

## Study 2

In Study 2, participants were asked to rate their past or future selves on a variety of experience-related and agency-related dimensions. Rather than using open-ended essays as in the prior study, participants responded to specified, closed-ended scales. In this study, participants thought about distant selves from 10 years into the past or future.

**Method.** In individual sessions, 80 people ( $M_{\text{age}} = 19.95$ ; 59% women) were recruited across public campus areas to voluntarily complete a short (between-subjects) survey about how people think about themselves. Participants were randomly assigned to think about themselves “10 years ago” (*past* condition) or “10 years from now” (*future* condition). First, they indicated what age they would be and what year it would be at the given time point. Then, they rated their past or future selves on 6 experience-related domains and 6 agency-related domains, taken from Gray et al. (2012). They were specifically asked: “Compared to your present self as you are right now, how much is this

past [future] self capable of..." *feeling pain, feeling pleasure, feeling desire, feeling fear, feeling rage, and feeling joy* (i.e., 6 experience domains), as well as *self-control, acting morally, planning, communication, memory, and thought* (i.e., 6 agency domains), from 1 (*much less capable*) to 5 (*much more capable*). The midpoint of the scale was labeled as 3 (*equally as capable*). These domains were randomly presented in 1 of 2 random orders.

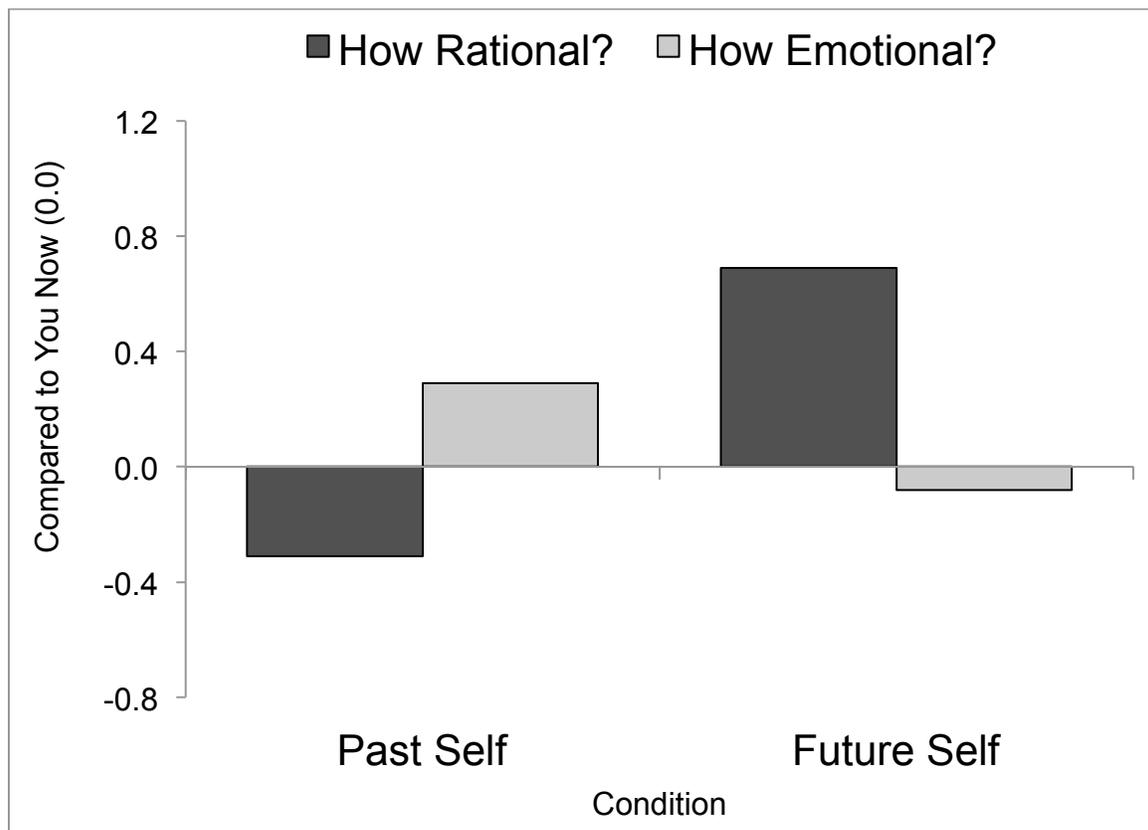
Next, participants rated how far their past or future felt (1 = *very near*, 7 = *very far*), how difficult it was to generate images of their past or future (1 = *very easy*, 7 = *very hard*), and how much they liked their past or future self (1 = *not at all*, 7 = *very much*). These questions were included in order to control for potential differences between mental representations of the past and future beyond agency and experience.

**Results.** Data were submitted to repeated measures MANOVA analyses. Consistent with prior research (e.g., Gray et al., 2012), the 6 agency items ( $\alpha = .87$ ) and 6 experience items ( $\alpha = .51$ ) were collapsed into composite scores that represented people's general sense of rationality versus emotionality, which were used as the within-subject factor. Past versus future condition served as the between-subjects factor.

There was no main effect of the agency/experience variable ( $p = .37$ ). There was a main effect of condition such that future selves were attributed more mind overall ( $M = 3.31$ ,  $SD = .28$ ) than past selves were ( $M = 2.99$ ,  $SD = .50$ ),  $F(1, 78) = 12.00$ ,  $p = .001$ . Importantly, this effect was qualified by the predicted interaction between condition and the agency/experience variable,  $F(1, 78) = 55.40$ ,  $p < .001$  (see Figure 3). As expected, past selves were attributed more experience ( $M = 3.29$ ,  $SD = .46$ ) than future selves were ( $M = 2.92$ ,  $SD = .35$ ),  $p < .001$ . In contrast, future selves were attributed more agency ( $M = 3.69$ ,  $SD = .41$ ) than past selves were ( $M = 2.68$ ,  $SD = .92$ ),  $p < .001$ . Comparing

experience and agency *within* each condition is also informative: past selves were attributed significantly more experience than agency ( $p < .001$ ), whereas future selves were attributed significantly more agency than experience ( $p < .001$ ).

**Figure 3.** Mean ratings of the presence of rational-related qualities and emotional-related qualities (within-subjects) as perceived in past versus future selves (between-subjects), relative to the present centered at 0.0.



Finally, regarding the covariate questions, participants did not differ between how far away their past or future felt ( $p = .77$ ) or how difficult it was to generate past or future images ( $p = .56$ ). Conversely, participants did like their future selves ( $M = 5.70$ ,  $SD = 1.07$ ) more than they liked their past selves ( $M = 5.10$ ,  $SD = 1.71$ ),  $p = .066$ . Importantly, all effects remained when entering these items as covariates in MANCOVA ( $ps < .05$ ).

These findings further support the hypothesis: past selves were characterized by experience whereas equidistant future selves were strongly characterized by agency. Consistent with related research on how people think about themselves over time (e.g., see Hershfield, 2011), these effects were observed across distant 10-year periods.

### Study 3

Study 3 sought to extend the results of Studies 1-2 in two important ways. First, participants were asked to think about themselves only 1 year into the distance and were recruited from a non-student population. This change serves as a check that the previous patterns indeed reflect differences in tense and not just a specific age gap between the perceived targets. Second, the next study employed original measures that were designed to more explicitly test the hypothesis. A practical reason for this change was to address the relatively low alpha of the experience scale from the last study ( $\alpha = .51$ ). This score is comparable to prior research—for instance, Gray et al. (2012) report experience alphas of .21, .53, and .56—but it may be useful to examine more diverse and explicit measures related to the hypothesis. In doing so, the next study can further check that the prior effects do not simply reflect a particular scale or phrasing.

**Method.** In individual sessions, 80 people ( $M_{\text{age}} = 29.79$ ; 55% women) completed an online study via Amazon’s Mechanical Turk. Following a between-subjects design, participants were randomly assigned to think about the person they “used to be 1 year ago” (*past* condition) or the person they may be “in 1 year” (*future* condition). The dependent variables were broken into two parts (see Appendix A for details of all measures). In one part, participants read 6 experience scenarios and 6 agency scenarios,

designed to map onto the 12 mind domains that were used in Study 2. For each rating, participants estimated how intensely their past or future self would react (e.g., “You get stung by a bee and feel pain. How much pain would your past self have felt? [might your future self feel?]), on scales from 1 (*not much*) to 7 (*a lot*). In the other part, participants assessed their past or future selves on 5 global, explicit measures of emotionality and 5 comparable measures of rationality (e.g., “In general, how emotional was your past self? [might your future self be?]), on scales from 1 (*not at all*) to 7 (*very*). All measures were presented in 1 of 2 random orders. Finally, participants also responded to 2 manipulation checks (“In this study, did you think about your past or future?” and “How many years into the distance were you asked to think about?”). Only 2 participants wrongly answered any of these manipulation checks, and thus they were removed from analyses ( $N = 78$ ).

**Results.** Data were submitted to independent samples t-tests, with past versus future condition as the independent variable.

For the scenario part of the study, the 6 experience scenarios ( $\alpha = .71$ ) and 6 agency scenarios ( $\alpha = .72$ ) items were collapsed into composite scores, which acted as the dependent variables. Note that this experience alpha is substantially higher than was observed in the experience scale from Study 2. More important, as expected, participants perceived their past selves as reacting with significantly more experience ( $M = 4.96$ ,  $SD = .91$ ) than how they thought their future selves would react ( $M = 4.44$ ,  $SD = .96$ ),  $t(76) = 2.39$ ,  $p = .019$ . Conversely, participants perceived their future selves as exhibiting significantly more agency ( $M = 5.43$ ,  $SD = .84$ ) than how much they thought their past selves exhibited ( $M = 4.83$ ,  $SD = .89$ ),  $t(76) = -3.08$ ,  $p = .003$ .

The same results were observed for participants' global and explicit assessments. The 5 emotionality items ( $\alpha = .75$ ) and 5 rationality items ( $\alpha = .80$ ) were collapsed into composite scores. Again, this emotionality alpha is much higher than in Experiment 1a. Moreover, as expected, participants thought their past selves were significantly more emotional ( $M = 4.81, SD = 1.00$ ) than their future selves ( $M = 4.21, SD = .91$ ),  $t(76) = 2.73, p = .008$ . Conversely, participants thought their future selves were significantly more rational ( $M = 5.58, SD = .86$ ) than their past selves ( $M = 4.78, SD = .90$ ),  $t(76) = -3.96, p < .001$ . Finally, for all dependent variables, these effects remained when covarying question order, age, sex, and ethnicity ( $ps < .05$ ). These findings extend the previous studies by showing that the same asymmetric patterns emerge when people are asked to rate proximate selves on more explicit measures.

#### Study 4

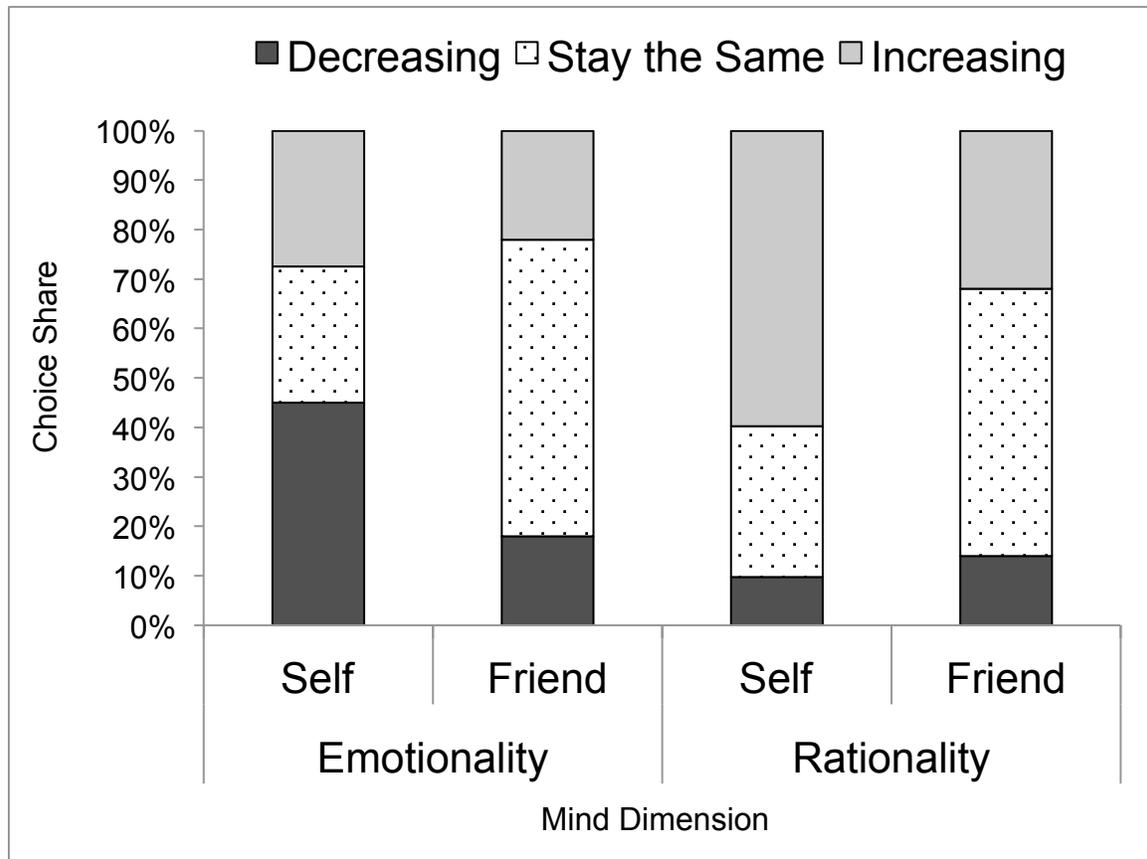
The first 3 studies helped establish the general effect: past selves are viewed in emotional terms whereas future selves are viewed in rational terms. The next study sought to examine whether these patterns reflect a more general past/future difference, or whether they indeed reflect something specific about the self. If temporal redistribution is completely driven by age and development, or by some phenomenological difference between thinking about the past versus future, then people should rate other targets in the same way as they rate themselves. In other words, people should also rate a *friend's* future as more agentic and past as more emotional than the present. Conversely, if the patterns reflect something about one's own development over time (e.g., beliefs about

personal progress and asymmetries in focalism, the primary posited mechanisms that were described in the introduction), then the patterns should only be observed for the self.

**Method.** In individual sessions, 202 people ( $M_{\text{age}} = 32.43$ ; 57% women) completed an online study via Amazon's Mechanical Turk. Following a between-subjects design, participants completed a survey about how people change over time. They were randomly assigned to compare "[themselves] about one year ago" to "[themselves] about one year from now" (*self* condition), or to type the initials of a good friend whom they knew much about and to compare "[this friend] about one year ago" to "[this friend] about one year from now" (*other* condition). Then, in random order, participants were asked to rate the target's change in "emotionality" and "rationality" across the given time period. Definitions were provided for each term and were described in a similar way to Study 1: emotionality was defined as big capacities for pleasure and pain and the ability to express strong feelings, whereas rationality was defined as big capacities for thought and planning and the ability to exert strong self-control. Again, both dimensions were described as being equally desirable to help prevent demand. For each, participants were given 3 answers from which to pick the most accurate: whether the target's emotionality and rationality will *increase*, *decrease*, or *stay the same* over the given period of time.

**Results.** Given that all dependent measures were comprised of forced-choice items within a mixed-model design, independent multinomial logistic regressions were conducted for emotionality and rationality, split by target. In other words, the percent chosen of each choice (*increase*, *decrease*, or *stay the same*) was compared within each dimension (*emotionality* or *rationality*), between targets (*self* or *friend*: see Figure 4).

**Figure 4.** Percentage of participants in each condition who chose either “decreasing,” “stay the same,” or “increasing” regarding the change in emotionality and rationality across a 2-year period within themselves or within a friend. As can be seen, temporal redistribution appears to occur only when thinking about changes in the self.



In terms of emotionality, there was the expected overall effect of target in line with the hypothesis,  $\beta = 1.32, p < .001, \text{Wald} = 16.22$ . When thinking about changes in emotions over time, most people indicated that *their own* emotionality will decrease (45.1%)—significantly more than the percentage of people who chose that their emotionality will increase (27.5%) or stay the same (27.5%),  $\beta = -.50, p = .038, \text{Wald} = 4.29$  for each comparison. In contrast, most people indicated that *their friend's* emotionality will stay the same (60.0%)—far more than the percentage of people who

chose that their friend's emotionality will decrease (18.0%:  $\beta = -1.20, p < .001, \text{Wald} = 20.07$ ) or increase (22.0%:  $\beta = -1.00, p < .001, \text{Wald} = 16.20$ ).

Accordingly, the opposite patterns emerged for rationality. Again, there was the expected overall effect of target,  $\beta = 1.15, p < .001, \text{Wald} = 15.28$ . When thinking about changes in rationality over time, most people indicated that *their own* rationality will increase (59.8%)—far more than the percentage of people who chose that their rationality will decrease (9.8%:  $\beta = -1.81, p < .001, \text{Wald} = 28.09$ ) or stay the same (30.4%:  $\beta = -0.68, p = .002, \text{Wald} = 9.42$ ). In contrast, most people indicated that *their friend's* rationality will stay the same (54.0%)—far more than the percentage of people who chose that their friend's rationality will increase (32.0%:  $\beta = -0.52, p = .019, \text{Wald} = 5.50$ ) or decrease (14.0%:  $B = -1.35, p < .001, \text{Wald} = 20.26$ ). In other words, temporal redistribution appears to only occur when thinking about the self.

Finally, given that judgments of emotions and rationality were made within subjects, it is also informative to examine how many people chose the hypothesized combination (i.e., decreasing emotionality plus increasing rationality) for themselves versus their friends. A one-sample binomial t-test revealed that, among all participants who reported this combination, the vast majority were in the “self” condition (84.6%) rather than in the “other” condition (15.4%),  $t(38) = -4.16, p < .001$ . Moreover, in terms of raw numbers via multinomial regressions, the relative majority of “self” participants (32.4%) reported the combination—significantly more often than any other possible combination of answers (all  $\beta\text{s} < -.79$ , all  $p\text{s} < .011$ ). In contrast, only 6% of “other” participants reported the combination, which was not significantly more often than any other possibility—and, in fact, much *less* often than a combination of “stay the same”,

$\beta = 1.64, p < .001$ . In other words, most “self” participants reported that their past selves were more emotional *and* their future selves will be more rational, whereas most “other” participants reported that their friends’ emotionality and rationality will stay the same.

These findings help shed more nuanced light on the asymmetric patterns that were observed in the first 3 studies. “Past = emotional” and “future = rational” associations were much more pronounced when people compared *their own* change across a two-year period than when they compared *a friend’s* change across the same points in time. In fact, when thinking about a friend, most people reported that capacities for emotionality and rationality will essentially remain unchanged. Thus, temporal redistribution cannot merely reflect some incidental effect of target age or general difference between past and future thinking, because these factors remain constant when thinking about a friend.

The final studies mark a departure from Studies 1-4 in the types of methods and measures that were employed. Specifically, Experiments 5-6 went beyond people’s explicit reports of their past and future mental capacities. Instead, these studies explored implications for changing real-time judgments (Experiment 3) and behaviors (Experiment 4) in the present, across a variety of parameters and outcomes.

Study 5 explored a downstream consequence with important interpersonal costs: how people might differentially explain away their own bad actions or behaviors that they remember committing in the past versus imagine committing in the future. In related research, Caruso (2010) measured people’s perceptions of fairness after manipulating external decisions over time (e.g., manipulating whether a fictional target had already done something unethical versus whether they were contemplating doing it: Caruso, 2010). The next study, however, specifically explored the role of perceived agency in

*one's own* actual behaviors. Given the intimate connection between agentic involvement and perceptions of morality (see Gray et al., 2012), Study 5 sought to explore the role of temporal redistribution in driving differences in moral judgment.

### Study 5

If past selves have more experience and future selves have more agency, then people might make different attributions for the same event that they imagine doing in the past versus in the future. Specifically, people may be more likely to “explain away” their bad behaviors from the past than bad behaviors from the future if they perceive their past selves as possessing relatively weak personal agency in bringing those behaviors about. In other words, people may feel less responsible for past bad acts than future bad acts. Ironically, an action that has already happened—thus involving actual responsibility—may seem less offensive than a future behavior that has yet to occur, precisely because people may differentially perceive the mental capacities of the “self” who commits it.

Study 5 explored this possibility. People were asked to think about bad behavior that they either had actually committed during the previous year, or that they may commit during the upcoming next year. If past selves are perceived as possessing weaker agentic capacities than future selves, then people should be inclined to claim less responsibility for past bad behavior than similar bad behavior at an equidistant future.

**Method.** In individual sessions, 68 people ( $M_{\text{age}} = 31.78$ ; 40% women) completed an online study via Amazon’s Mechanical Turk. Following a between-subjects design, participants were randomly assigned to remember a bad behavior that they actually committed last year (*past* condition) or imagine a bad behavior that they could commit

next year (*future* condition). Bad behavior was defined as “an incident in which you do something bad, such as lying, cheating, stealing, or being mean to someone else.” To help encourage honesty, participants were explicitly asked to not identify the behavior.

Next, participants rated their agreement with the following 6 statements on a sliding scale from 0 (*disagree completely*) to 100 (*agree completely*): how much this behavior is *excusable* and *understandable*, and how *bad*, *guilty*, *regretful*, and *shameful* this behavior makes them feel. These questions served as the measure of responsibility. Then, participants also rated how detailed their generated behavior seemed (1 = *not at all*, 7 = *very*) in order to help control for potential differences beyond responsibility.

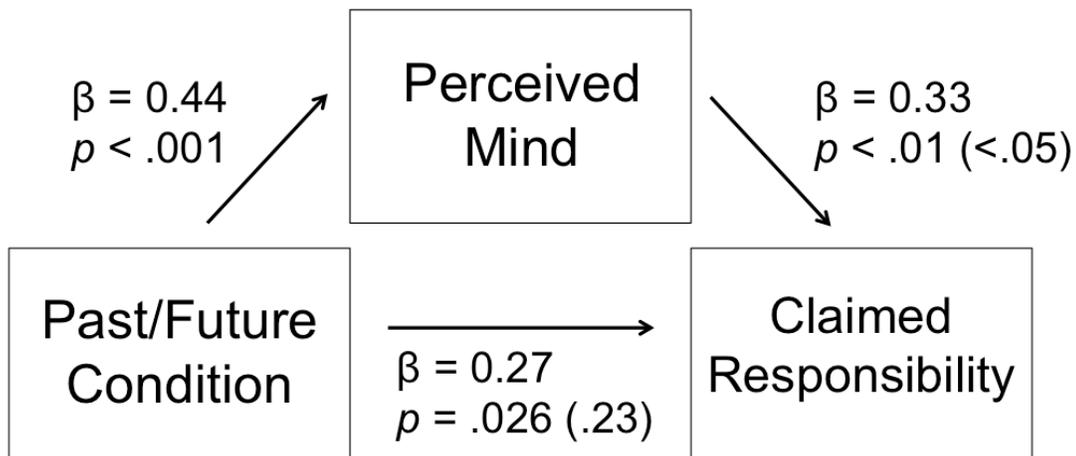
After this main part of the study, participants were asked to rate their past or future mental capacities in terms of agency and experience, as a means of replicating the temporal redistribution patterns and also to serve as a possible mediator. Participants in the past condition rated their agreement with the following two statements: “My past self from last year is the type of person who is a strong ‘agent’: proactive and rational” and “My past self from last year is the type of person who is a strong ‘experiencer’: reactive and emotional” (each from 0 = *disagree completely*, 100 = *agree completely*). A difference score was calculated by subtracting rational from emotional, in order to obtain an overall “mind” rating for past selves. The same items and procedures were used to rate future selves from next year among participants in the future condition.

**Results.** A composite index of responsibility was created for the dependent variable (reverse-coded excusable, reverse-coded understandable, feel bad, feel guilty, feel regretful, and feel shameful:  $\alpha = .81$ ). Data were then submitted to independent samples t-tests, with past versus future condition as the independent variable.

As predicted, participants claimed significantly less responsibility for past bad behavior ( $M = 63.28$ ,  $SD = 15.89$ ) than future bad behavior ( $M = 73.01$ ,  $SD = 19.24$ ),  $t(66) = -2.28$ ,  $p = .026$ . Moreover, there was no difference between the level of detail for thinking about the past ( $M = 5.22$ ,  $SD = 1.56$ ) versus future ( $M = 5.33$ ,  $SD = 1.04$ ),  $t(66) = -.36$ ,  $p = .72$ , and the effect of the past/future variable on responsibility remained when entering detail as a covariate in ANCOVA ( $ps < .05$ ).

Regarding the proposed mediator, the asymmetric patterns were replicated from previous studies: mental capacities were rated as much more rational when participants thought about their future minds ( $M = 33.03$ ,  $SD = 32.36$ ) than when thinking about their past minds ( $M = -.34$ ,  $SD = 36.43$ ),  $t(66) = -4.00$ ,  $p < .001$ . In turn, and in line with the theoretical framework, mind perception fully mediated the effect of the past/future variable on how much responsibility people claimed (Hayes, 2012: 95% bootstrap confidence interval = [.41 to 10.42], which excludes the value 0; see also Figure 5).

**Figure 5.** Multiple regression mediation model (Baron & Kenny, 1986) showing the influence of temporal condition (past or future) on claimed responsibility, as influenced by perceptions of mind. The *ps* in parentheses show the strength of the path between two variables when the third variable is controlled for.



These results highlight an important downstream consequence of temporal redistribution. Because people perceive their past selves as possessing relatively less agency than in the present and future, they are less likely to claim responsibility their own immoral behaviors that occur in the past than at other time points. The mediation analysis provides direct evidence suggesting that differences in how responsible participants feel about their own bad behaviors over time are driven by the perceived mental capacities associated with the type of “self” who is thought to commit them. On the other hand—and on a more comforting note—people feel quite responsible for their bad behaviors yet to come, because future selves seemingly possess more agency in bringing them about.

### Study 6

The final experiment tested another consequence of people’s associations for “emotional pasts” and “rational futures,” extending beyond judgments of past and future actions to how they might potentially influence people’s choices and preferences in the present. If past selves are perceived as emotional experiencers, then inducing people to feel connected to their pasts may lead them to make more emotional choices and prefer feeling-related content. By the same logic, inducing people to feel connected to their futures should lead them to make more rational choices and prefer thinking-related content. Study 6 tested these possibilities. In doing so, it sought to use temporal redistribution as a novel framework for understanding differences in actual choice.

**Method.** In individual sessions, 190 undergraduates ( $M_{\text{age}} = 19.47$ ; 50.5% women) completed a laboratory study in exchange for course credit. Following a

between-subjects design, participants completed a study ostensibly about role playing and imagination. They were randomly assigned to *past*, *future*, or *present* (control) conditions. To start the study, “past” participants were told to think about the type of person they were from about 1 year ago, and “future” participants were told to think about the type of person they will be about 1 year from now. They were asked to reflect on this other self and spend a minute forming a mental image of this person. Importantly, participants were not given any specific details or boundaries in order to prevent demand (e.g., “reflect on how you used to *feel* or *think*”); they were primed only with their freely generated images of their past or future self.

Next, participants were asked to “role play” as this past or future self and perform subsequent tasks as if this other self had come into the lab. This role playing design was adapted directly from prior work on how people think about themselves over time (e.g., O’Brien, under review; Pronin & Ross, 2006). Because participants are never instructed how to exactly act or what to specifically imagine in their other selves, their behavioral responses can thus serve as a discreet proxy for their perceptions of mind over time. “Present” participants skipped right to the movie selection measure (described below).

Then, participants moved to the actual role playing task. They were shown a list of movies and were asked to choose which ones they prefer. Materials were adapted from prior work on preferences for “should” versus “want” entertainment content (Williams & LeBoeuf, 2013). The list was divided between 10 prototypical “thinking” movies that had been released on DVD during the preceding few years, and 10 similar “feeling” movies. “Thinking” movies were defined as follows: “These types of movies are typically serious, thoughtful, and intellectual, like documentaries, art films, and foreign films. They may

not be a rollicking good time, but they provide enrichment and intellectual stimulation. In short: people tend to watch these movies for more rational reasons.” Examples included *The Reader*, *Milk*, and *Doubt*. Conversely, “feeling” movies were defined as follows: “These types of movies are typically fun, funny, or frivolous, like a comedy, romance, or action flick. They are very enjoyable to watch in the moment, but are somewhat forgettable after the fact. In short: people tend to watch these movies for more emotional reasons.” Examples included *Star Trek*, *The Hangover*, and *Duplicity*. A picture of the cover art and a brief plot description were provided for each movie. Participants were explicitly told that both categories of movies should be viewed as equally valuable and desirable, but were simply meant for different types of occasions.

Participants were then asked, “Assuming you had enough free time right now, which type of movie would you choose?”, and chose either the “thinking” or “feeling” category. It was also made clear that their choice was not limited to the movies indicated on the list, and that the list was simply meant to provide possible examples. Afterwards, “past” and “future” participants rated how difficult it was to role play as their other self (1 = *not at all*, 7 = *very*), how difficult it was to imagine their other self (1 = *not at all*, 7 = *very*), and how far away their other self feels from the current moment (1 = *not very far*, 7 = *very far*). These measures served to help account for potentially relevant differences caused by the manipulation beyond agency and experience.

**Results.** Data were submitted to binary logistic regression analyses, with condition as the predictor variable (“past,” “present,” or “future”) and movie choice (“thinking” or “feeling”) as the dependent variable. In terms of the “present” control group, participants generally preferred “feeling” movies to “thinking” movies (68.85%).

However, as expected, connecting to one's future self significantly diminished this preference (46.88%), whereas connecting to one's past self significantly enhanced it (83.08%),  $\beta = -.86$ ,  $p < .001$ , Wald = 17.66. Put another way, connecting to one's future self led participants to choose "thinking" movies more often than they typically would, whereas connecting to one's past self led to a stronger preference for "feeling" movies.

Finally, regarding the covariate and demographic questions, "past" and "future" participants did not differ between how difficult it was to role play as their other selves ( $p = .83$ ), how difficult it was to imagine their other selves ( $p = .47$ ), or how far away their other selves felt ( $p = .28$ ). And importantly, the effect of time on movie choice remained significant when controlling for all of these variables,  $\beta = -.98$ ,  $p < .001$ , Wald = 18.18.

These results highlight novel implications for temporal redistribution to change real-time preferences and choices in the present. Because past selves are perceived as emotional experiencers, people who are induced to connect to their past selves are more likely to choose emotional, feeling-based content; conversely, connecting to agentic future selves makes people more likely to choose rational, thinking-based content.

## **Chapter Discussion**

Many people spend many moments mentally travelling through time, journeying beyond immediate experience to retrace what once was and to entertain what might be (Gilbert & Wilson, 2007; Trope & Liberman, 2003; Tulving, 2002). Six experiments revealed that the type of person awaiting our arrival depends on which direction we have embarked. When thinking about their pasts, people see someone who is more capable of emotionality but less capable of rational thought. But when thinking about an equidistant

future, people see someone who is more capable of thinking rationally but less sensitive to emotions. This temporal asymmetry reflects a redistribution of mental capacities for experience (emotional reactivity, body sensitivity) versus agency (cognition, rationality). Participants spontaneously described their past selves in emotional terms and future selves in rational terms (Study 1). Further, they explicitly ascribed experiential qualities to past selves but agentic qualities to future selves—at both distant (Study 2) and proximate (Study 3) points. These associations were specific to imagining one's own change over time (Study 4), and had important consequences for how people construe their own behaviors (Study 5) and for what they actually choose (Study 6) in the present.

**Multiple Mechanisms.** As outlined in the introduction to this chapter, there are a number of likely pathways that could lead people to perceive their past selves as emotional and their future selves as rational. Collectively, however, the current studies help rule out some of these possibilities and also point to a candidate explanation.

On the one hand, people's temporal perceptions may simply be correct, to the extent that they look back to the past at an objectively more emotional life stage (e.g., adolescence) and to a more cognitive-focused life stage in the future (e.g., working adulthood: for a detailed developmental review see Damon & Eisenberg, 1998). This account, however, does not fit the current studies, which find the hypothesized patterns among participants of older age groups and using short time frames (e.g., people in their mid 30's who thought about only 1 or 2 years across time). Here, it seems unlikely that participants were thinking about past and future selves who were significantly more or less mature or among a qualitatively different age bracket than in the present.

Another possible explanation might reflect general phenomenological differences between the act of thinking about past versus future moments, or perhaps broader beliefs about general change in the world (see Van Boven et al., 2009 for a review). Again, however, many of the current studies controlled for relevant differences (e.g., perceived temporal distance from the present; difficulty in generating past versus future images) and still found significant effects. More telling is Experiment 2, which showed that temporal redistribution does *not* occur when thinking about a friend over time. This finding cannot be accounted for by the above explanation, given that tense was held constant and differences were still observed *within* past and *within* future conditions.

Thus, the candidate mechanism proposed in the current paper draws a bridge between the literatures on perceptions of progress and focalism. It is well-established that people believe their lives move towards something, that they learn and grow wiser over the course of their development regardless of their actual life stage (e.g., Heckhausen & Krueger, 1993; Markus & Ruvolo, 1989; McAdams, 2006; Sedikides & Hepper, 2009). In short, people tend to optimistically believe that their futures will be more positive and promising than their pasts (see Burger, 1985). In turn, one reason for this optimism may be due to basic asymmetries in focalism: both ups and downs from the actual past are accessible and can be brought to mind, whereas thoughts of the hypothetical future are decontextualized and largely focus on successful outcomes (Johnson & Sherman, 1990; Kahneman & Lovallo, 1993; Newby-Clark & Ross, 2003; Wilson & Gilbert, 2003). Thus, if people simply *can* recall the inevitable times when plans went awry and they were caught by emotional forces—but *fail* to predict the impact of these “hot” emotional states in the future—the hypothesized asymmetry in mind perception should be observed.

Taken together, the current studies suggest that traditional conceptualizations of the future as uniformly bigger, better, or “more” may need to be amended to consider not just a single dimension but two. Consistent with prior work on perceptions of increasing competency, control, willpower, and motivation (Helzer & Gilovich, 2012; Ryff, 1991; Taylor, 1983; Williams & LaBoeuf, 2014; Wilson & Ross, 2001), participants perceived their future selves as stronger agents than their present selves, and past selves as weaker. Going beyond prior work, however, participants did not rate their future selves as greater experiencers. Rather, future selves were ascribed *less* experience than their past or present selves, and *past* selves were perceived as most emotional of all. This distinction, although prominent in research on perceptions of others (Asch, 1946; Fiske et al., 2002; Gray et al., 2007; Schneider, Hastorf, & Ellsworth, 1979; Wiggins & Broughton, 1991), has thus far been lost in describing how people think about themselves. As a result, prior work has largely lumped agency-specific characteristics into a single category of “self,” concluding that the future is uniformly “increasing” from the past. These results reveal that people do *not* uniformly perceive the future as “more” but specifically more agentic, with correspondingly weaker emotional experience. Perceptions of the past and future are not more or less in general but sensitive to perceived capacities of past and future *minds*.

**Theoretical Insights.** The perceived distinction between emotional pasts and rational futures provides an overarching structure from which to understand why people make overly optimistic plans (Buehler, Griffin, & Ross, 2002; Kahneman & Tversky, 1979), hyperbolically discount future rewards (Frederick et al., 2003), predict that they will have unrealistically positive life outcomes (Weinstein, 1980), imagine behaving more morally than they actually would behave (Epley & Dunning, 2000), and a host of

related forecasting errors (for reviews see Johnson & Sherman, 1990; Ross & Buehler, 2004; Wilson & Gilbert, 2003). If future selves are seen as highly agentic and not very emotionally reactive, these “errors” in predicting future feelings, thoughts, and behaviors may only be wrong to the extent that we think the person doing the feeling, thinking, and behaving possesses a different type of mind than the one we have today; there is an “error” in who we think we will *be*, not how we think that person might respond. Indeed, the notoriously weak correlation in the social sciences between attitudes (e.g., intending to vote) and behavior (e.g., actually voting; see Wicker, 1969) seems reasonable if people believe their highly agentic future selves will follow through with the plans, insensitive to the inevitable emotional pulls that come along the way. Someone who is independent and hard-to-sway might very well meet deadlines, finish plans, react less intensely to small rewards, and wait for \$500 in 12 months in lieu of \$450 in 11 months—precisely the type of person who we imagine being in prospect, but not necessarily who we are in real time.

On a more specific note, these findings help explain the phenomenon of *future anhedonia*, in which people predict that identical hedonic states will be less satisfying in the future than in the present (Kassam, Gilbert, Boston, & Wilson, 2008). This insight may also account for why people so often struggle to empathize with their future selves (Hershfield, 2011); it might be difficult to feel empathy for someone who we think has relatively weak emotional capacities. Furthermore, it may account for why people can accurately recall past reactions and yet *still* wildly mispredict their reactions in the future (Novemsky & Ratner, 2003; Wilson, Meyers, & Gilbert, 2001)—like comparing apples and oranges, past selves are perceived as strong experiencers who may not seem like an appropriate proxy to judge future agents. Similarly, Experiment 3 suggests people may be

inclined to explain away bad behaviors in terms of a past capacity for affective reactivity, which not only has obvious interpersonal costs (e.g., justifying past transgressions) but may blind them to past decisions they may prefer to not repeat. For example, a struggling dieter could have failed an exercise plan because of a poor trainer or book, but attribute the failure to their past emotional mind and return to the same unhelpful advice. Clearly, any benefits of perceiving tomorrow as more agentic seem limited once people reach the future and find themselves no better off than how they were before.

More generally, these results help enrich the literature on construal level theory of temporal distance (Liberman et al., 2007; Trope & Liberman, 2010), which posits that the same event is represented in different ways depending on if it feels close or far from now. Because people infer distinct mental capacities in themselves at equidistant points in time, these results complement a growing body of work highlighting phenomenological asymmetries between mental representations of the past and future at a constant distance (Burns, Caruso, & Bartels, 2011; Caruso, 2010; Caruso, Gilbert, & Wilson, 2008; Van Boven & Ashworth 2007). For example, Burns et al. (2011) showed that people perceive others' behavior as more intentional when they imagine it in the future versus the past, which maps closely onto an "agentic" perspective.

Perhaps most interestingly, Study 6 suggests that goal-directed choices and behavior may be facilitated by employing a fit between one's goal and one's current temporal orientation. Experiential goals (e.g., to more fully enjoy an upcoming vacation, meal, date, party, or leisure activity) might be facilitated by encouraging a sense of connection between one's present and past ("How would my past self have reacted?"). Agentic goals (e.g., to fight pain, stick with a plan, resist temptation, act morally) might

be facilitated by encouraging a sense of connection between one's present and future ("How might my future self react?"). Given the prevalence of self-regulatory failures and impediments to goal pursuit (e.g., see Baumeister, Heatherton, & Tice, 1994; Fishbach & Ferguson, 2007), examining the connection between how people perceive their pasts and futures in relation to the present may afford novel and surprisingly simple solutions.

**Future Directions.** These results provide many interesting avenues for follow-up research. From an individual difference perspective, naturally past-oriented people could be more in touch with their emotions and naturally future-oriented people could be more in touch with their thoughts (Zimbardo & Boyd, 1999). Also, there may be important boundary conditions to the general patterns, such as intense negative mood (i.e., people who are depressed may not perceive their future selves as highly agentic: Alloy & Ahrens, 1987) or if people have reason to believe they have changed over time (Ross, 1989). Other work might continue to explore problematic implications. For example, a student who strongly believes in an agentic tomorrow might actually be *more* inclined to procrastinate and delay study efforts today, assuming that his or her future self will be better suited to handle the work.

Conceptually, future studies might tease apart more exact parameters of the effect. One interesting route could more closely examine exactly what types of emotions and cognitions do or do not follow the pattern. More "proactive" emotions, for example—like feeling determined or interested—may be perceived as ever-increasing, particularly if the phenomenon is capturing people's perceptions of declining reactivity or passivity. On a similar note, there could be a variety of interesting cultural differences in temporal redistribution, to the extent that people's valuation of agentic and experiential traits varies

beyond relatively homogenous Western samples. Intriguingly, one might be able to flip the patterns simply by manipulating people to value their emotions more highly (e.g., by first reading an alleged science article about the value of emotions in decision making).

**Summary.** Results of 6 studies have provided converging evidence for a robust temporal asymmetry in how people perceive changes in their internal mental states: past selves are viewed as emotional experiencers, whereas future selves are viewed as rational agents, reflecting people's optimism about growing more in control and wiser over time. This observation thus adds to a rich literature on how people think about the minds of others, which so far has focused on mind perception across space but not time (Epley & Waytz, 2009). Perceiving minds has been established as a pervasive component of many interpersonal processes—and apparently the *intrapersonal* process of mental time travel is no exception. When looking back to the past we see a person who is generally more emotional and less rational, but waiting in the future is someone generally more rational and less emotional. This asymmetry has important implications for how people make sense of past and future behaviors, and for how they navigate the world in real time.

## CHAPTER IV

### Conclusion

If the present “barely has time to exist” (Kahneman & Riis, 2005, p. 285), then all that remains of a life are mere perceptions of moments gone by and of those still to pass. This inescapable component of mental and social life has comprised the broad scope of my dissertation. I sought to explore the role of tense in everyday judgment and decision making, and examine the temporal asymmetries that can emerge in how people process an otherwise similar experience. Indeed, tense matters: 1 year into the past is not the same as 1 year into the future, even if their level of abstraction is comparable (in contrast to other popular accounts of construal; see Trope & Liberman, 2010). More specifically, my dissertation highlighted asymmetries in valence: people’s pervasive and deep-rooted beliefs that their tomorrows will be more positive than their yesterdays or their todays.

The 2 papers presented here provide complementary evidence for how such optimistic perceptions persist and come to be maintained and reinforced, even when people face information that may suggest otherwise. At an “external” level—how people think about the possibility of life events themselves—I demonstrated that people simply discount cues that forewarn of negative events in their futures (i.e., fluency for imagining unhappy future experiences), stubbornly believing those events will not actually occur (Chapter II). Similarly, at an “internal” level—how people think about changes in their own internal traits and abilities—I demonstrated that people perceive their future selves

as possessing superior mental capacities (e.g., self-control and rational thought) as compared to their past and present selves (Chapter III); hence, even if bad events were to happen, people believe that their future selves will be better equipped to handle them. Rather than trying to “prove” that optimism is uniformly advantageous (e.g., in that it provides health benefits, boosts mood, and facilitates goal pursuit: Seligman, 2008) or uniformly detrimental (e.g., in that it biases decision making and puts people in overly risky situations: Sharot, 2012), these findings add to the dense and diverse literature on optimism by pointing to *when* positive perceptions of the future should help versus hurt.

The “discounting fluency” paper suggests that optimism should pose particular problems to the extent that people focus on future events that are both negative and objectively likely to occur, given that people may disregard this objective information and put themselves at risk of being unprepared for the unpleasant. By the same logic, however, optimism should help to the extent that people focus on future events that are negative and unlikely (because they will rightly not be bothered), or any positive events. One real “problem” of optimism, then, may rest on this valence-specific split: that the prospect of negative events has less aversive impact than the boosts provided by positive events. Objective likelihood of future events hence may represent a critical moderator of when optimism should serve as an advantage or as a disadvantage. The “emotional pasts and rational futures” paper takes this implication a step further: after likely negative events inevitably occur, people may not learn from their past mistakes of (not) preparing because they overestimate their future ability to cope. Getting people to better appreciate the impact of *bad* life experiences (rather than taming their overly positive perceptions) may thus represent a fruitful way to tighten the focus of the existing optimism literature.

Finally, going beyond optimism per se, one of my overarching interests in choosing this dissertation topic was to highlight the role of time as a central social psychological construct. In the opening quote, James urged us to think about temporal life dualistically with regards to how people divide their pasts from their futures, in what would ultimately become his broader theory of the “specious present” (1890). In the many years since, empirical studies have more or less followed this train of thought. Lewin (1943) helped formalize James’ perspective with his “life-space” framework, which emphasized the primacy of the present in dynamically shaping how people perceive distant experiences. And more contemporary work (including this dissertation) has continued to focus on time in terms of the past versus present versus future, such as research into affective forecasting (e.g., Gilbert & Wilson, 2007), temporal construal (e.g., Trope & Liberman, 2003), and autobiographical recall (e.g., Wilson & Ross, 2001).

In addition to the various nuances that have been uncovered about past and future thinking, there remain many ways to define time as a variable of interest. For example, awareness of “when” an event occurs—such as how we come to understand “beginnings” and “endings”—may play an important role in evaluation and liking; the “thought speed” in processing our experiences could impact broader inferences, behaviors, and wellbeing; feeling connected to certain life stages or eras might predict differences in personality and preferences; and our sense of change may be intimately tied to everyday goal pursuit.

A number of studies have begun to address these and other questions, building a case for time as a rich construct of social psychological inquiry deserving of its own book chapters, seminars, conference themes, and beyond. I hope my dissertation not only sheds light on past and future processes, but in doing so helps add to this burgeoning subfield.

## APPENDIX

A. All dependent measures in Chapter III, Study 3. All participants completed all measures, but were randomly assigned to rate either their past or future self 1 year into the distance. For the scenarios, participants were asked to estimate how intensely their past or future self would respond on scales from 1 (*not much*) to 7 (*a lot*). For the global assessments, each item began with the phrase “In general...”, and participants responded on scales from 1 (*not at all*) to 7 (*very*).

### Experience Scenarios

- 1) You get stung by a bee and feel pain.
- 2) You take a nap and feel pleasure.
- 3) You crave your favorite food and feel desire.
- 4) You scream at the sight of a bug and feel fear.
- 5) You get into a fight with a friend and feel rage.
- 6) You turn on your favorite movie and feel joy.

### Agency Scenarios

- 1) You are tempted by a guilty pleasure but need to exhibit self-control.
- 2) You are in a dilemma and need to act morally.
- 3) You need to make careful and detailed plans ahead of time.
- 4) You need to give a public speech and communicate your words powerfully.
- 5) You need to rely on your memory.
- 6) You need to organize your thoughts clearly and think independently.

### Global Assessments of Emotions

- 1) How emotional was your past self? [might your future self be?]
- 2) How reactive was your past self? [might your future self be?]
- 3) How sensitive was your past self? [might your future self be?]
- 4) How easily moved was your past self? [might your future self be?]
- 5) How swayable was your past self? [might your future self be?]

### Global Assessments of Rationality

- 1) How rational was your past self? [might your future self be?]
- 2) How proactive was your past self? [might your future self be?]
- 3) How strong-minded was your past self? [might your future self be?]
- 4) How in-charge was your past self? [might your future self be?]
- 5) How cognitively-skilled was your past self? [might your future self be?]

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