

**The Affective Consequences of Mental Time Travel: An investigation of the  
immediate affective consequences of past and future-oriented thoughts and their  
regulation via cognitive reappraisal and social regulation strategies**

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**The Affective Consequences of Mental Time Travel: An investigation of the immediate affective consequences of past and future-oriented thoughts and their regulation via cognitive reappraisal and social regulation strategies**

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The ability to mentally time travel means that people are also subject to the negative affective consequences associated with past and future-oriented thoughts. Across three lines of research, I investigate the immediate affective consequences of past and future-oriented thoughts as well as how they can be regulated through both cognitive and social regulation techniques.

In the first set of studies, I demonstrate that *busyness* is spontaneously construed in terms of its negative features, which undermines well-being. Specifically, this work demonstrates that individuals' subjective feelings of time (i.e., feelings of time scarcity; perceptions of work-life balance) are predictive of well-being above and beyond the effects of objective time use (i.e., the number of hours worked; objective work-life balance). Moreover, this effect is ubiquitous and unaffected by individual differences in personality traits (i.e., extraversion; neuroticism), demographic factors (i.e., age, gender, income, geographic location, or living environment), or the circumstances in which the feelings are experienced (e.g., work; home; driving).

In a second set of studies, I demonstrate that busyness can also be construed in terms of its positive features (i.e., productivity) if people are explicitly prompted to do so. Moreover, this work demonstrates that construing busyness in terms of these positive (vs. negative) features can causally increase well-being.

In the last set of studies, I demonstrate that the negative affective consequences elicited by the recall of upsetting memories can be preemptively buffered by the imagined presence of an attachment figure (i.e., mother; partner). Moreover, the present work provides evidence the positivity elicited by the imagined presence of an attachment figure (vs. more specific attachment-related feelings such as comfort and support) are sufficient to drive this buffering effect.

## **BIOGRAPHICAL SKETCH**

Steve Strycharz was born in Providence, RI, but left the Ocean State when he was three years old. He spent the rest of his childhood in the metro-Detroit area and then began his undergraduate studies at the University of Michigan. Throughout his life he was always captivated by the way different people would often interpret and respond to the same situation in vastly different ways. This interest in people's subjective experience of their environments led him to pursue a degree in psychology, where he conducted research in Dr. Ethan Kross's Emotion and Self Control Lab. After graduating from the University of Michigan, he moved to Ithaca, NY to begin a Ph.D. program at Cornell University, partially because he felt uncomfortable with the notion of living in a city that did not experience at least 8 months of snow and ice. While at Cornell, Steve worked with Dr. Vivian Zayas in the Personality, Attachment, and Control Lab, in addition to working as a Graduate Resident Fellow on Cornell's West Campus Housing System.

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## CHAPTER I. Introduction

Imagine you were offered the opportunity to win one million dollars by playing a dating game designed to assess the strength of the bond between you and your romantic partner. To win the prize money, the only thing you have to do is correctly guess how your partner is currently feeling in the present moment. To make it easier, you are provided with information regarding what your partner is currently doing (e.g., working, visiting with friends, or eating dinner), who they are with (e.g., their friend Casey, their co-worker Alex, or their sibling Pat), and you are even provided with four options to choose from (e.g., happy, sad, or angry), one of which is the correct answer that was provided by your partner minutes earlier. Do you feel confident that you could answer correctly and win the prize? Do you think the provided information is sufficient for you to accurately guess your partner's mood? Or could your partner's mood instead be primarily determined by factors unrelated to their current objective environment, such as thoughts related to the past (i.e., a positive memory) or the future (i.e., a stressful upcoming deadline)? The present work is primarily interested in how past and future-oriented thoughts can influence affective experiences in the present and how these in-the-moment affective responses can be regulated.

People often believe that they can accurately perceive how others are feeling and why they feel that way. Although these perceptions can at times be accurate, people are much less accurate than they assume (Dunning, et al., 1990; Dunning, Heath, & Suls, 2004; Fischhoff, Slovic, & Lichtenstein, 1977; Moore & Healy, 2008; Russo & Schoemaker, 1992; Vallone, et al., 1990). One reason for this inaccuracy is the assumptions we make about the causes of other people's affective states. For example, when we observe and

attempt to explain another person's affective state, we often assume that it must be the direct result of their immediate objective environment. This is because our judgments are often based on the small subset of available information, which is often limited to the observable features of the external environment (Karylowski & Ranieri, 2006; McGuire & McGuire, 1986; Pronin et al., 2001). Since we do not have access to the content of other people's minds, we cannot know the internal processes that might be influencing their affective states. Not only is it difficult to know the cause of another person's affective state because different people perceive and interpret objective situations based on their own unique memories and experiences (Mischel & Shoda, 1995; Engler, 2008), but people's affective states can also be the direct result of past or future-oriented thoughts, independent of the features of their current environment (Bower, 1981; Damasio et al., 2000). For example, the anxious, distressed expression on the face of someone waiting for their flight at an airport might not have been caused by factors related to the current situation (i.e., a delayed flight, excessive travel hours, or a fear of flying) but instead by their thoughts of the unusually long hours they will be working while on the work trip. Indeed, previous research has demonstrated that past and future-oriented thoughts can elicit strong affective responses in the present (Bowers, 1981; Damasio et al., 2000; McFarland & Buehler, 1998; Nolen-Hoeksema et al., 2008; Speer & Delgado, 2017). Moreover, these in-the-moment affective responses elicited by past or future-oriented thoughts can have important effects on well-being (Richard, van der Pligt, & de Vries, 1996; Speer & Delgado, 2017; Zeelenberg, 1999; Zeelenberg & Pieters, 2004). The present work investigates the causes of these in-the-moment affective reactions to past and future-oriented thoughts and how the associated negative affective consequences can be regulated. The current chapter

reviews past research on the human ability to mentally time travel into the past and future and the affective consequences that can result.

### **Mental time travel**

The ability to mentally time travel into the past or the future can, at times, be beneficial and have important effects for both the present and future. A number of scholars have argued that the primary function of this ability is to enhance biological fitness for the future (Ansuini et al., 2015; Benoit, Berkers, & Paulus, 2018; MacLeod & Conway, 2007; Orbell, Hodgkins, & Sheeran, 1997). Mentally simulating negative future circumstances and their consequences can spontaneously motivate goal-relevant behavioral changes in the present in order to avoid future negative outcomes (Milne, Sheeran, & Orbell, 2000). For example, when future-oriented thoughts elicit fear in the present, it can lead people to form adaptive strategies that facilitate attitudes, intentions, and behaviors that are instrumental for avoiding potential negative outcomes associated with the fear-eliciting situation (Boster & Mongeau, 1984; Milne, Sheeran, & Orbell, 2000; Sutton, 1982). Moreover, these feelings elicited in response to future situations significantly increase behavioral intentions and their enactment, even when controlling for other determinants of behavior such as attitudes, subjective norms, perceived behavioral control, or past behavior (Parker, Manstead, & Stradling, 1995; Perugini & Bagozzi, 2001; Richard et al., 1995; Richard et al., 1996). This functional role of future-oriented thoughts occurs in response to positive future events as well (Abraham & Sheeran, 2004; Lowenstein & Lerner, 2003; Zeelenberg, 1999). For example, prospecting about a potential future work promotion might elicit feelings of excitement, thereby increasing the accessibility and likelihood of engaging in constructive behaviors that make the promotion more likely.

If mentally time travelling into the future can function to motivate goal-relevant behaviors, can mentally time travelling into the past also serve important functions? Indeed, people often draw on past experiences in order to extract content that can be used to simulate future events (Dudai & Carruthers, 2005). This is because memories contain information of past outcomes (i.e., failures and successes) and the behaviors that were instrumental (or detrimental) for successfully attaining these outcomes (Conway et al., 2004). Therefore, future-oriented thoughts can elicit feelings that motivate people to engage in behaviors that allow them to avoid undesirable situations (or approach desirable ones), while past-oriented thoughts can provide relevant content that can enable people to plan what specific behaviors ought to be enacted in order to attain those desired outcomes (Dudai & Carruthers, 2005).

### **The affective consequences of mental time travel**

The ability to mentally time travel into the past and future can provide beneficial functions, but this ability also means that people are subject to the affective consequences associated with these past and future-oriented thoughts (Bower, 1981; Damasio et al., 2000). When someone is recalling an autobiographical memory, they often experience the same affective reaction or even an enhanced experience of the affective reaction that occurred when the situation was initially encountered (Bowers, 1981; Damasio et al., 2000; Nolen-Hoeksema et al., 2008). Moreover, bringing autobiographical memories to mind not only elicits the associated affect (McFarland & Buehler, 1998; Speer & Delgado, 2017), but also engages the associated neural circuitry, such as corticostriatal circuits that are influential in maintaining mood (Admon & Pizzagalli, 2015; Heller et al., 2009; Speer, Bhanji, & Delgado, 2014). The in-the-moment affective experiences associated with

memories are so strong and reliable that they have been used to serve different functions in psychological research. For example, researchers often have participants recall upsetting autobiographical memories as a way of eliciting negative affect (Dunn & Schweitzer, 2005; Goritz & Moser, 2006; Strack, Schwarz, & Gschneidinger, 1985). Similarly, positive memories have been used as a way of regulating both the negative affect and cortisol responses that are normally produced from a stress-inducing lab task (i.e., immersing hand in ice-cold water while being recorded) (Speer & Delgado, 2017). Not only can memories elicit affective reactions in the present when they are intentionally recalled, but their spontaneous recall can have significant effects as well. For example, the spontaneous activation of negative memories is associated with aversive states like rumination, which is characterized by the repeated and uncontrollable focus on events that cause negative affect (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008). Not surprisingly, the inability to control these negative memories can lead to psychological disorders such as depression, PTSD, and generalized anxiety disorder (e.g., Brewin, 2007; Mathews & MacLeod, 2005; Nolen-Hoeksema et al., 2008), as well as physical health problems including cardiovascular disease (e.g., Brosschot et al., 2006; Schwartz et al., 1981).

Like memories, future-oriented thoughts can also elicit in-the-moment affective reactions (Abraham & Sheeran, 2004; Conway et al., 2004; Lowenstein & Lerner, 2003). Empirical research conducted on affective reactions to future events (i.e., future oriented emotions) has focused on both *anticipatory emotions* and *anticipated emotions* (Abraham & Sheeran, 2004; Lowenstein & Lerner, 2003; Richard, van der Pligt, & de Vries, 1996; Zeelenberg, 1999; Zeelenberg & Pieters, 2004). Anticipatory emotions are affective

reactions that are experienced in the present due to the prospect of a desirable or undesirable future event. For example, imagine an individual is waiting to hear back about a job they recently applied for. The individual might experience anticipatory emotions such as hope or fear, depending on how optimistic they feel about the outcome. Anticipated emotions, on the other hand, are based on an individual mentally simulating what it would feel like when a future event occurs, such as an individual feeling joy while imagining receiving a prestigious award (Zeelenberg, 1999; Zeelenberg & Pieters, 2004). Similar to the feelings elicited by autobiographical memories, emotions experienced in the present that are elicited by future events can be so strong that people rely on them to manipulate stress and emotion in experimental studies (Dickerson & Kemeny, 2004; Kirschbaum et al., 1993; Williams, Hagerty & Brooks, 2004). For example, in order to manipulate stress and investigate various ways of regulating the stress, researchers might tell participants that they will be giving an impromptu speech in 5 minutes that will be judged by experts and also recorded, since it leads participants to ubiquitously experience negative anticipatory emotions (Kirschbaum, Pirke & Hellhammer, 1993; Kudielka, Hellhammer, & Kirschbaum, 2007). These future-oriented emotions have such a large impact on present affect that they are a predictor of mental health (MacLeod & Salaminiou, 2001). For example, those who are optimistic about their future often experience mental health benefits (Newby-Clark & Ross, 2003), while those whose thoughts about the future are less positive have a higher likelihood of depression, other mental health issues, and even suicide (MacLeod & Conway, 2007). Given the negative affective consequences of the spontaneous and intentional activation of both past and future-related thoughts, the

development of techniques and strategies that can regulate these affective responses is important.

### **Regulating affective reactions to past and future-oriented thoughts**

The way people think about the future can differ from how they think about the past (Caruso, Gilbert, & Wilson, 2008; Helzer & Gilovich, 2012). For example, people's thoughts about their past often have a relatively balanced amount positive and negative content, while people's thoughts about their future are more likely to be positively biased (Buehler, Griffin, & Ross, 1994; MacLeod & Conway, 2007; Weinstein, 1980). These differences might lead to the assumption that the regulation of affect resulting from present, past, and future-oriented thoughts might require different regulation strategies, but current research suggests that this is not the case. Regardless of the source of an affective reaction (i.e., past, present, future), the affective response is experienced in the same way (MacLeod & Conway, 2007; McFarland & Buehler, 1998). For example, the experience of affective responses to autobiographical memories mirrors the response that was elicited when the situation was initially encountered (Bowers, 1981; Damasio et al., 2000; McFarland & Buehler, 1998; Nolen-Hoeksema et al., 2008; Speer & Delgado, 2017). Similarly, past work has demonstrated that people's self-reported affective responses to prospective events is highly correlated with their in-the-moment affective responses to immediate events (MacLeod & Conway, 2007). Moreover, upsetting memory recalls and prospectations focused on stressful future events are often used in empirical tests designed to verify the effectiveness of regulation techniques and to explore their boundary conditions (Goritz & Moser, 2006; Kirschbaum et al., 1993; Kudielka, Hellhammer, & Kirschbaum, 2007; Strack, Schwarz, & Gschneidinger, 1985). Together, these findings support that notion that

the same regulation techniques can be used to regulate affective responses, regardless of whether the reactions were elicited from past, present, or future-oriented stimuli.

The present work focuses on two different techniques: cognitive reappraisal and social regulation. Cognitive reappraisal is a regulatory strategy based on the appraisal processes of emotions (Gross, 1998; Gross, 2002; Jameison et al., 2016). When an affect-eliciting situation is encountered, the specific emotional reaction experienced by a particular individual is determined by the way they explain the situation, the meaning they extract from it, and the source to which they attribute the reaction (Ellsworth & Scherer, 2000; Frijda, 1986; Lazarus, 1966; Roseman, 1984; Smith & Ellsworth, 1985). Similarly, cognitive reappraisal regulates affective reactions by manipulating the construal and meaning of a stimulus (Gross, 1998; Gross, 2002; Gross & John, 2003; Hayes et al., 2010; John & Gross, 2004; Wrosch et al., 2000). Initial investigations of the effects of cognitive reappraisal were typically conducted in laboratory settings and were based on participants' reconstrual of photographs or short video clips (Dillon et al., 2007; Gross, 2002; Hayes et al., 2010; Richards et al., 2003). However, more recent work has demonstrated the real-world benefits of cognitive reappraisal by testing its effects in a more ecologically valid setting (Jameison et al., 2016). Specifically, this work has demonstrated that construing stress as a tool that can improve performance (vs. an obstacle that can hinder performance) can result in beneficial affective, cognitive, and behavioral reactions that are instrumental for goal pursuit (Jameison et al., 2016). Since the regulatory benefits of cognitive reappraisal have been demonstrated in a real-world environment and result from changes in the cognitive representation of a situation (vs. the objective features of a situation), the present work utilized this technique to investigate whether construing an upcoming period

of busyness in terms of its positive features (e.g., productivity) as opposed to negative features (e.g., feelings of time scarcity) could attenuate its negative impact on well-being.

Social regulation is another form of regulation technique that relies on the affective benefits provided by others (Gump et al., 2001; Holt-Lundstad et al., 2003; Mikulincer & Shaver, 2007; Simpson, Rholes, & Nelligan, 1992). Past work has demonstrated that the physical presence of close others can regulate both physiological and affective systems (see Sbarra & Hazan, 2008; Selcuk, Zayas, & Hazan, 2010, for reviews). For example, being in the physical presence of a relationship partner while anticipating a stressor (e.g., electric shock or anxiety associated with giving a speech) can dampen the neural threat response (Coan et al., 2006) and decrease physiological responses (i.e., blood pressure, heart rate, and cortisol levels) (Ditzen et al., 2007; Ditzen et al., 2008; Grewen et al., 2003). Moreover, the physical presence of an attachment figure can also regulate the subjective experience of stress and pain (Brown et al., 2003; Jackson et al. 2005). In addition to the regulatory benefits provided by the physical presence of close others, their imagined presence can also confer these benefits as (Hofer, 1984; Mikulincer & Shaver, 2007). Over time, associations between support seeking and subsequent reductions in stress, pain, and negative affect are stored in memory (Beckes, Simpson, & Erickson, 2010; Bowlby, 1973, 1982; Collins, Guichard, Ford, & Feeney, 2004; Mikulincer & Shaver, 2007; Zayas, Surenkok & Pandey, 2017). Thus, the mental representation of an attachment figure (i.e., the imagined presence of the attachment figure) ought to also provide regulatory benefits by activating physiological and psychological states similar to those that were elicited during the original interactions (Depue & Morrone-Strupinski, 2005; Hofer, 1984; Mikulincer & Shaver, 2007; Uvnas-Moberg, 1998). Past work has primarily focused on how the imagined

presence of attachment figures can help an individual recover from a negative experience after it has been encountered (Eisenberger et al., 2011; Master et al., 2008; Younger et al., 2010). However, since exposure to an attachment figure should automatically activate feelings of safety and positivity (e.g., Mikulincer & Shaver, 2007; Zayas & Shoda, 2005), regulatory benefits ought to also arise when the mental representation of an attachment figure (i.e., imagined presence) is activated *prior* to a negative affective stimulus or stressor. The present work assessed whether the negative affective responses to upsetting memories can be preemptively regulated by the imagined presence of an attachment figure.

## **Outline of subsequent chapters**

### ***Chapter II***

This chapter focuses on “busyness,” a topic that is relatively understudied empirically, yet has received significant amounts of attention from the general public and popular media sources. Across six studies, we explore people’s spontaneous construals of what it means to “be busy” and the downstream consequences these different construals might have on well-being. The opening sections review previous work related to busyness, including the ways in which it previously has been operationalized. Additionally, these sections report past research that demonstrates the effects these previously established conceptualizations can have on well-being.

The experiments were designed not only to learn more about how people spontaneously construe what it means to be busy, but also to assess the affective consequences of the various features of busyness. Specifically, Study 1 assessed how people spontaneously construe busyness and coded these construals to identify important features of busyness. Studies 2 and 3 were designed to explore how well-being is affected

by both subjective feelings of busyness (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance). Specifically, these studies assessed whether subjective feelings of busyness are predictive of well-being above and beyond the effects of the objective time use, and whether the relationship is influenced by individual differences in personality traits (i.e., extraversion and neuroticism) or by demographic factors (i.e., age, gender, income, living environment, and geographic location). Studies 4 and 5 sought to test whether the effects reported in Studies 2 and 3 would replicate in a more ecologically valid environment when the busyness-related feelings were elicited from the immediate environment. Specifically, Study 4 investigated whether subjective feelings of busyness continue to predict well-being when people are working in a more natural setting (i.e., while working at a library), while Study 5 utilized an experiencing sampling methodology to assess whether this relationship depends on the particular activity an individual is currently doing (e.g., working, making dinner, or getting dinner with friends). In order to establish a causal relationship between subjective feelings of busyness and well-being, Study 6 directly manipulated feelings of time scarcity.

### ***Chapter III***

After initially establishing the relationship between subjective feelings of busyness and well-being (independent of the effects of objective time use), the next set of studies investigated whether these affective responses could be regulated. Specifically, the work assessed whether busyness can be construed in terms of positive features in addition to its negative features and whether construing busyness in terms of its positive features could provide affective benefits. This section begins by reviewing the negative effects of

busyness, but then proposes that being busy might actually have beneficial effects as well. After suggesting and providing examples of these potentially positive features of busyness, the section reviews a regulation technique (i.e., cognitive reappraisal) that could allow people to attenuate the resulting affective responses by construing busyness in terms of these positive features.

Study 1 was designed to investigate whether people can construe busyness in terms of its positive features and to identify the specific content of these positive features. Study 2 provided an initial investigation of whether these positive features of busyness can attenuate or even reverse the negative affective consequences of being busy. In Study 3, participants were instructed to construe a busy situation in terms of its negative or positive features, thereby providing causal test of whether construing busyness in terms of its positive (vs. negative) features influences well-being.

#### ***Chapter IV***

This chapter shifts focus away from the affective consequences of busyness and future-oriented thoughts and instead focuses on how close others can help regulate the affective sting elicited from upsetting autobiographical memories. Specifically, the work assessed whether the *imagined presence of an attachment figure* can preemptively buffer against the negative affect elicited from *upsetting memories*. Moreover, the mechanism through which this buffering effect might occur was explored. The initial sections of this chapter review past research focused on the regulatory benefits of attachment figures. They describe work demonstrating how the physical presence of an attachment figure can aid in the regulation of stress, pain, and negative emotional experiences. It also highlights research that has shown that the imagined presence of an attachment figure can also help

individuals *recover* from negative affective experiences *after* they have occurred. The present work builds on this past research by investigating whether these mental representations of attachment figures can *preemptively buffer* against the negative affect elicited by upsetting autobiographical memories.

Studies 1a and 1b assessed whether the imagined presence of an individual's mother can preemptively buffer against the negative affect elicited by negative memories. Study 2 built on the findings from Studies 1a and 1b, exploring whether these preemptive affective benefits can result from exposure to the imagined presence of an individual's relationship partner as well. Study 3 was designed to address a limitation of the previous studies, thereby seeking to demonstrate whether the preemptive buffering effect is indeed driven by affective benefits resulting from the exposure to the attachment figure primes as opposed to negative affective consequences resulting from exposure to the control conditions used in Studies 1a-2 (i.e., a photograph of a stranger). Studies 1a-3 sought to provide initial evidence that the positivity elicited by the attachment figure photograph acts as the mechanism through which the buffering effect can occur. Studies 4 and 5 aimed to further explore this mechanism by directly manipulating positivity through the use of new control conditions. Specifically, Study 4 used a photograph of a participant-chosen celebrity, since they have been shown to elicit positivity. However, it is possible that celebrities might elicit attachment-related feelings (e.g., comfort and support) in addition to general positivity, given that they are social in nature. Therefore, Study 5 used another positive control (i.e., a photograph of a positive object) in order to elicit positivity without eliciting attachment-related feelings. By comparing the buffering ability of attachment

figures, positive objects, and neutral controls, the present work investigated the mechanism driving this buffering.

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## **CHAPTER II. Pressed for Time? Perceived time scarcity undermines well-being**

### **Abstract**

The pervasiveness of busyness in Western culture is viewed as a major public concern. People today claim to be feeling busier than ever before and believe that this busyness is a leading contributor to the decline in the quality of daily life. However, reports of people's average number of working hours are mixed, with some claiming an increase and others claiming a decrease. Moreover, the objective number of hours people spend working can indeed have negative affective consequences, but past work has suggested that time is also experienced subjectively, and that the subjective feelings associated with time can have affective consequences as well. In order to more accurately assess the relationship between busyness and these negative affective consequences, the present work first sought to identify the specific features of busyness. Then, the remaining studies investigated how these specific features of busyness predict well-being. Specifically, Study 1 used a bottom-up, qualitative approach to identify the features participants use when mentally construing busyness. Importantly, some of these features were associated with objective time use (e.g., number of working hours and objective balance between work-related and nonwork-related time use), while others were related to subjective feelings about time (e.g., feelings of time scarcity and perceptions of work-life balance). Studies 2 and 3 sought to assess how these features, related to subjective feelings (i.e., feelings of time scarcity and perceived work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance), predict well-being. Specifically, the results provided initial evidence that these subjective feelings predict well-being above and beyond objective time use. Study 4 sought to increase ecological validity and to assess how

well-being is affected by subjective feelings of time scarcity associated with a present task (vs. feelings of time scarcity associated with a future task). The results indicated that these subjective feelings of time scarcity did indeed decrease well-being. As an initial investigation of a causal relationship between subjective feelings of time scarcity and decreased well-being, Study 5 utilized an experience sampling methodology to assess how feelings of time scarcity predict fluctuations in well-being. The results demonstrated that these fluctuations co-occur, suggesting that subjective feelings of time scarcity decrease well-being, independent of situational and demographic factors. Study 6 provided further evidence of a causal link between subjective feelings of time scarcity and decreased well-being by directly manipulating participants' subjective feelings of busyness. These findings demonstrated that *subjective* perceptions of busyness predict well-being above and beyond the effects of objective time use.

### **Pressed for Time? Perceived time scarcity undermines well-being**

In 1926, Henry Ford decreased the number of hours his Detroit production plant employees were required to work, thereby establishing the prototypical 40-hour (vs. 50-hour) work week. Imagine how Ford Automotive Company employees would respond if they were told that this policy would be eliminated next year, and they would again be required to work an additional 10 hours per week. Upon receiving this news, would these employees be likely to suffer negative affective consequences due to their knowledge of this upcoming change? If so, would this negative affective response be the direct result of the increased number of hours the employees would be working? Or could the affective response be the result of their subjective interpretation of how this change would affect their lives?

In Western Cultures it is common to express “being busy” but empirical research investigating what it means to be busy, as well as the consequences of being busy, has lagged behind its colloquial usage. However, researchers have recently begun theorizing about busyness as a construct, suggesting that it has both an objective component (i.e., how time is spent) and a subjective component (i.e., how time is experienced) (Thompson et al., 2006; Yang & Hsee, 2018). Moreover, some researchers have started to investigate how objective time use (e.g., the number of hours someone spends working and the objective balance between work-related and nonwork-related time use) can influence well-being. Similarly, others have recently assessed how subjective feelings of time (e.g., the amount of time someone *feels* they have and their perceptions of their work-life balance) predict well-being. However, to my knowledge, the present work is the first to 1) use a bottom-up, qualitative approach to identify common features of busyness and 2) to assess how

subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) predict well-being above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance).

### **Objective workings hours**

The pervasiveness of busyness in Western culture is viewed as a major public concern (Menziez, 2009), with reports indicating that more Americans than ever before are “always feeling rushed” (Gleick, 1999). However, despite many people and popular media sources expressing an increase in “busyness” (Menziez, 2009), evidence of an objective increase in the number of hours people spend working is mixed. Some sources report an increase in the average number of hours people spend working (Schneider et al., 2004; Zuzanek, 2004), while others report a yearly decline in working hours per year since the end of the Industrial Revolution (Ramey & Francis, 2009; Roser, 2019). Moreover, other databases indicate neither an increase nor a decrease in working hours, claiming that the average number of hours worked has remained relatively stable over the past 40 years (Aguiar & Hurst, 2007). In addition to the number of hours an individual spends working, past work has suggested that people can also feel busy due to their subjective experiences of time (Thompson et al., 2006; Yang & Hsee, 2018). Thus, the present work investigates the effect that these subjective feelings have on well-being above and beyond the effects of objective time use.

### **The affective consequences of objective time use**

It is reasonable to assume that objective time use (e.g., number of hours worked and objective work-life balance) would influence well-being. Indeed, the number of hours employees spend working is a predictor of stress and can lead to burnout, anxiety,

depression, and negative physical health outcomes (Perlow, 1999; Shanafelt et al., 2012). Research conducted by Zuzanek (2004) and Schneider et al. (2004) indicate that increased hours of paid work is one of the contributors to the increased stress experienced by contemporary families. Similarly, the number of hours worked and spent commuting to work per week (Bohen & Viveros-Long, 1981; Burke et al. 1980; Schafer & Keith, 1980; Pleck et al., 1980), as well as the amount and frequency of overtime, all contribute to a work-life imbalance, which has been reported to have negative psychological and physical consequences (Pleck et al., 1980; Keeton et al., 2007; Linzer et al., 2000). Additionally, the amount of time people spend working influences the amount of time left for other aspects of their life, such as spending time with family or engaging in leisure activities. This can create a conflict and an imbalance between work-related and nonwork-related time use. Past work on the effects of objective work-life balance has demonstrated that these imbalances can lead to burnout, stress, physical health problems, and both job and life dissatisfaction (Keeton et al., 2007; Linzer et al., 2000; Mazerolle, Bruening, & Casa, 2008; Shanafelt et al., 2012). Together, these findings demonstrate that the objective number of hours people work and their objective work-life balance can be important factors in determining well-being. However, the present work is interested in whether subjective feelings of time predict well-being above and beyond the effects of objective time use.

### **Subjective experiences and well-being**

Objective circumstances can indeed influence well-being, but a person's subjective experience of a situation can also have important consequences (Armenta, Ruberton, & Lyubomirsky, 2015; Diener, 1994, 2000; Diener et al., 1999; Lyubomirsky, 2000). For example, when it comes to the relationship between income and happiness, it is not the

objective amount of money different individuals earn yearly that predicts happiness (Diener & Biswas-Diener, 2002; Myers, 2000). Instead, happiness is the result of how individuals choose to spend their disposable income (Aknin et al., 2013; Dunn, Aknin, & Norton, 2014; Van Boven & Gilovich, 2003; Whillans et al., 2016), how individuals mentally represent what they buy (i.e., whether the focus is directed to the technical aspects of the product or instead the experience of using the product) (Carter & Gilovich, 2010; Rosenzweig & Gilovich, 2012), and how much income they have relative to others (Easterlin, 1995; Easterlin, 2003). Similarly, past research has demonstrated that work-life balance can be conceptualized both as objective work-life balance (i.e., the actual balance between work-related and nonwork-related time use) and as subjective work-life balance (i.e., an individual's subjective perceptions of the balance between their work-related and nonwork-related time use) (Haar et al., 2016; Kossek et al., 2014; Maslach, 2003; Maslach & Johnson, 1981; Maslach & Leiter, 2016). These subjective perceptions of work-life balance have important implications for well-being (Brough et al., 2014; Lunau, et al., 2014; Lyness & Judiesch, 2014). For example, people who perceive balance between their work-related and nonwork-related roles tend to be more satisfied with their life and report better physical and mental health (Brough et al., 2014; Carlson, Grzywacz, & Zivnuska, 2009; Ferguson, Carlson, Zivnuska, & Whitten, 2012; Greenhaus et al., 2003; Haar, 2013; Lunau, et al., 2014). Moreover, these subjective perceptions of work-life balance have been demonstrated to increase stress and burnout (Maslach, 2003; Maslach & Johnson, 1981; Maslach & Leiter, 2016).

In line with work demonstrating the important effects subjective experiences have in other diverse domains (including theoretically similar ones such as work-life balance), I

reasoned that an individual's subjective feelings of time ought to have an important impact on well-being. Specifically, I hypothesized that these subjective feelings of time and subjective perceptions of work-life balance will predict well-being above and beyond the effects of the objective number of hours an individual spends working and the objective balance between their work-related and nonwork-related time use. Providing initial support for this view, past research has demonstrated that subjective feelings of time pressure can increase stress (Kaluza, 2007) and decrease mood and well-being (Garling et al., 2014). Moreover, people who subjectively perceive themselves as being overworked show elevated levels of physiological markers of stress, such as cortisol levels (Frankenhaeuser et al., 1989; Schlotz et al., 2004). Similarly, subjective perceptions of work-life balance are predictive of overall mental health (Brough et al., 2014; Carlson, Grzywacz, & Zivnuska, 2009; Ferguson et al., 2012; Greenhaus et al., 2003; Haar, 2013; Lunau et al., 2014; Lyness & Judiesch, 2014; Maslach, 2003; Maslach & Johnson, 1981; Maslach & Leiter, 2016). This past work demonstrates the importance of subjective feelings, but the present work builds on these findings by investigating whether these subjective feelings predict well-being above and beyond the influence of objective time use.

### **The components of well-being**

In order to investigate how both subjective feelings of time and objective time use influence well-being, it is important to understand the processes through which well-being arises. According to Diener et al. (2010), well-being is comprised of both moment-to-moment affective feelings (i.e., mood) and broader evaluations of life more generally (i.e., life satisfaction). These two components (i.e., mood and life satisfaction) are interrelated and often correlated, but they arise from different processes. The first component is

hedonic, focusing on moment-to-moment fluctuations between positive and negative affective states (Diener, 2000). The momentary affective experiences give rise to an individual's current mood. The second component focuses on cognitive evaluations of global life circumstances, such as an individual's assessment of whether they have gotten the things they want in life and how satisfied they are with their life (Diener et al., 1985). These cognitive assessments result in an individual's overall life satisfaction. Although some work has suggested that life satisfaction is a stable, dispositional trait (Costa & McCrae, 1980; McCrae & Costa, 1991; Pavot & Diener, 1993), other work has demonstrated that life satisfaction fluctuates based on an individual's situational environment (Schwarz & Clore, 1983; Schwarz & Strack, 1999). The distinctive qualities of mood and life satisfaction have been corroborated by studies demonstrating that they statistically diverge as independent factors when assessed together and are therefore assessed using separate measures (Andres & Whitey, 1976; Lucas, Diener, & Suh, 1996; Lyubomirsky & Lepper, 1999; Watson et al, 1988).

Despite mood and life satisfaction arising from different processes, they are both likely to be affected by subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance). A long line of research has supported the notion that positive and negative affect (i.e., the two components of mood) function as indicators of goal progress (Carver & Scheier, 1981; Powers, 1973). Specifically, they are components of a feedback loop that involves an awareness of an individual's current state and desired state (Powers, 1973). When progress toward the desired state occurs more slowly than expected, negative affect is elicited to motivate people to engage in behaviors that will aid in goal progress. Similarly, when goal progress is occurring faster than usual, positive affect is elicited to

signal successful progress to the individual (Carver & Scheier, 1981). Thus, feelings of time scarcity are likely to elicit negative affect in order to signal that the pace of progress must be increased in order to achieve the desired goal within an allotted amount of time. Additionally, these subjective feelings ought to decrease an individual's satisfaction with life. Specifically, if an individual feels that there is not enough time to meet the current demands of their life, that individual is likely to view their life as less than ideal. This negative assessment of their life circumstances is likely to decrease their overall life satisfaction. Given that well-being arises from both moment-to-moment affective reactions and cognitive assessments of life circumstances, the present work assessed how subjective feelings and objective time use predict both mood and life satisfaction.

### **The Present Research**

The present research aimed to 1) identify features of busyness using a bottom-up, qualitative approach and 2) to investigate how subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) predict well-being above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance). Six studies were conducted to address these aims. Study 1 was designed to identify the various features people use to construe “busyness” and what it means to “be busy.” Specifically, the results revealed that people spontaneously construe busyness in terms of the following features: *subjective feelings of time scarcity* (i.e., feeling as if there is not enough time to do what needs to be done), *long working hours*, *a lack of work-life balance*, *multi-tasking*, and *extrinsic motivation*. The remaining studies focused on how subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance) predict

well-being. Study 2 investigated how these subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance) predict well-being, while controlling for individual differences in personality traits (i.e., extraversion and neuroticism) that could potentially influence feelings of time scarcity, well-being, or the relationship between the two. The results demonstrated that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) significantly predicted well-being above and beyond the effects of objective time use (i.e., number of working hours and objective work-life balance). Study 3 investigated the same question as Study 2, but with a larger, more nationally representative sample. Study 3 replicated the findings from Study 2 and demonstrated that the relationship between subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and well-being is present in people from various demographic backgrounds. Study 4 investigated whether these subjective feelings would still predict well-being outside of the lab, in a more ecologically valid setting. Specifically, the findings revealed that subjective feelings of time pressure related to a current task are negatively correlated with well-being. Study 5 was designed to provide initial evidence of a causal relationship between subjective feelings of time scarcity and decreased well-being. An experience sampling methodology (ESM) was used to demonstrate that this relationship occurs for all people regardless of their dispositional characteristics and regardless of the activity in which they are currently engaged. Study 6 experimentally manipulated feelings of time scarcity to demonstrate that they causally decrease well-being.

## Study 1

Past work has suggested that busyness has both an objective component (i.e., how time is used) and a subjective component (i.e., how time is perceived or experienced) (Thompson et al., 2006; Yang & Hsee, 2018). However, few other scholars have attempted to define busyness as a construct or to identify its various features. Thus, Study 1 was designed to advance our understanding of busyness and what it means to “be busy.” Specifically, I was interested in whether people generally construe busyness as a negative or positive state. Moreover, I sought to identify the specific features individuals use to construe busyness. Importantly, I assessed the content of participants’ construals using open-ended questions. I intentionally used this bottom-up, qualitative approach to ensure that participants’ construals of busyness were not biased by my own prior conceptualizations.

### Method

**Participants.** The sample consisted of forty participants (20 women) recruited from Amazon Mechanical Turk. Since this was a more representative sample (vs. exclusively undergraduate participants), age ranges were used instead of specific ages. The percentage of participants from each age bracket was as follows: 17% 18-24, 53% 25-34, 13% 35-44, 10% 45-54, 2% 55-64 and 5% 65+. Participants received a small monetary payment as compensation for their participation. The number of participants was determined by the principle of saturation (see *Design* section below).

**Procedure and materials. Overview.** Participants were recruited in groups of 20 and asked to complete several open-ended questions designed to investigate the way they spontaneously construe busyness. Two research assistants assessed whether participants’

construals of busyness were positive or negative and then grouped them into categories based on the busyness-related features they identified. Since participants responded to three different open-ended questions, it was possible for each participant's responses to be coded into multiple themes. Participants were then debriefed regarding the purpose of the study and provided monetary compensation.

**Design.** A bottom-up, qualitative design was used to assess how people spontaneously construe busyness. In the first phase of the study, 20 participants were recruited. After the responses from the first 20 participants were coded and categorized, 20 more participants were recruited. Data collection was ended after the recruitment of 40 total participants based on the principle of saturation, that is, because the responses collected from the second set of 20 participants did not reveal any additional features, data collection was ended and no more participants were recruited (Crouch & McKenzie, 2006; Glaser & Strauss, 1967; Guest, Bance, & Johnson, 2006).

In order to assess participants' spontaneous construals of busyness, they first read an introductory prompt: "*In everyday life, people sometimes say they are 'busy' or 'feel busy.' We are interested in your definition of busyness.*" Then, they were asked to provide an open-ended response to each of the following three questions (1) "*How do you define busyness?*" (2) "*Please think about the last time you felt busy. Describe the specific situation below.*" (3) "*What was it about this situation that made you feel busy?*" Although the primary investigation of busyness was focused on present feelings elicited from future tasks and deadlines, we asked participants to recall a busyness-related situation from the past because this was likely to provide more concrete details (vs. situations in the future

that have not yet occurred, which were likely to have been mentally represented more abstractly).

**Data Analytic Strategy.** To assess the way participants spontaneously construed busyness, two independent research assistants coded responses in three ways: First, participants' responses were coded based on valence, that is, they were coded as either containing positive or negative features. For example, responses were coded as negative if the participant construed busyness in terms of subjective feelings of time scarcity or having to work long hours. Second, responses were categorized based on the features identified in their construals. Importantly, these features were categorized without *a priori* assumptions, that is, the coders were not provided with an initial set of features to guide their categorization. Instead, any responses containing novel features were sorted into a new group, while any subsequent responses that contained a previously identified feature were added to the already established group. For example, any responses that referred to feelings of time scarcity were placed into one group and any responses referring to objective number of hours spent working were placed into another group. Third, the features were categorized into two larger groups based on whether they were subjective (e.g., subjectively *feeling* rushed and short on time) or objective (e.g., I spend so many hours at work that I have little time to complete my non-work responsibilities). Since the two research assistants who coded the responses identified the same features, both in terms of number and content, I felt confident that the feature-based categories were objectively distinguishable from each other. Once responses from the 40 participants were coded, another independent coder went back through each response to code for the presence of these newly identified features.

## Results

**Valence.** Participants' responses were first coded based on valence, which revealed that participants almost unanimously (39 of the 40) construed busyness in terms of negative features (i.e., negative feelings and objectively negative situations). The single participant who construed busyness in terms of positive features defined it as "... *the feeling of doing something that is important, that matters.*"

**Features.** Participants responded to only three separate questions about busyness, but there was an average of 2.35 features reported by each participant (94 in total). Participants' construals of busyness revealed five important features: 1) *number of hours worked* (i.e., the objective number of hours spent on work-related activities,) 2) *subjective feelings of time scarcity* (i.e., feeling rushed or like there is not enough time to do what needs to be done), 3) *work-life balance* (i.e., dissatisfaction with the amount of time allocated to work-related activities vs. nonwork-related activities), 4) *multi-tasking* (i.e., working on multiple tasks at the same time), and 5) *extrinsic motivation* (i.e., working on things that one needs to do vs. wants to do). The frequency of these themes can be found in Figure 2.1.

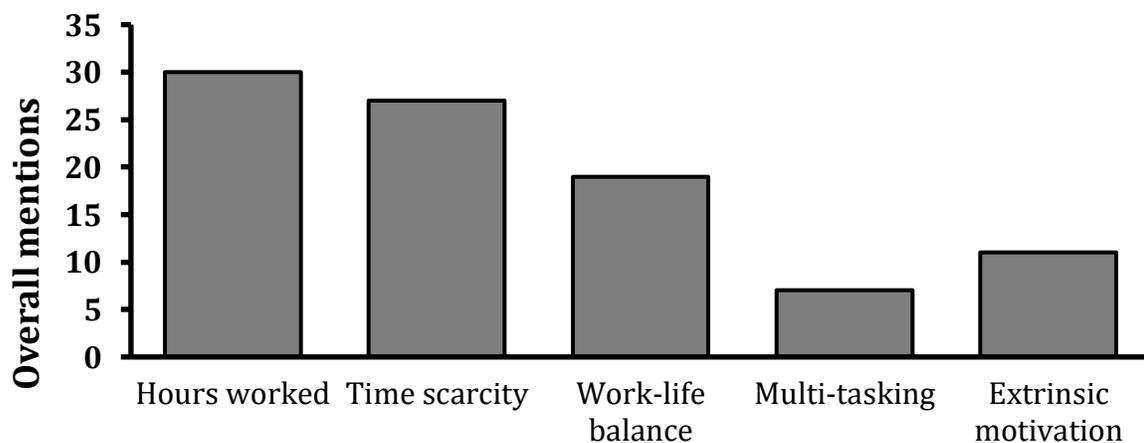


Figure 2.1 Identified features of busyness: Hours worked=30, time scarcity=27, work-life balance=19, multi-tasking=7, and extrinsic motivation=11.

## Discussion

Study 1 revealed that individuals overwhelmingly construed “busyness” in terms of negative features. Moreover, participants’ construals of busyness revealed 5 main features (i.e., *number of hours worked*, *feelings of time scarcity*, *work-life balance*, *multi-tasking* and *extrinsic motivation*). These construals were also in line with past work suggesting that busyness has both an objective and subjective component. Specifically, participants’ construals of busyness contained both features related to subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance).

Study 1 did not use statistical analyses to verify the results, but the validity of the features identified in the present work are supported by previous findings related to busyness. The most common busyness-related feature was the *number of working hours*. Not only is it reasonable to assume that people’s construals of busyness would include the objective way they spend their time and the amount of time they spend on work-related activities, but this feature has also been suggested by past work, which describes busyness in terms of an individual’s objective time use (Yang & Hsee, 2018). Moreover, the notion that this feature would be associated with negative affect is supported by past research directly demonstrating that the number of hours people work and increases in working hours (e.g., working overtime) have negative affective consequences, including increased stress and depression, as well as decreased job satisfaction, physical health, and overall emotional well-being. Similarly, the identification of *subjective feelings of time scarcity* as a feature of busyness is also supported by previous work, which proposed that busyness can be based on people’s subjective experience of time (in addition to objective time use)

(Thompson et al., 2006; Yang & Hsee, 2018). This feature has also been shown to be associated with negative affect. Specifically, subjective feelings of time pressure decrease mood and well-being (Garling et al., 2014) and increase stress and stress-related cortisol levels (Kaluza, 2007). It is not surprising that *work-life balance* was also identified as a feature of busyness because it is characterized by a person's objective time use (i.e., balance between work-related and nonwork-related activities) and satisfaction with that balance. Furthermore, its association with negative affect is directly supported by past work demonstrating the negative affective consequences of both objective and subjective work-life imbalance (Carlson, Grzywacz, & Zivnuska, 2009; Greenhaus et al., 2003; Haar, 2013; Keeton et al., 2007; Linzer et al., 2000; Mazerolle, Bruening, & Casa, 2008). These three features were not only most representative of people's construals of busyness, but they also closely fit the subjective and objective components of busyness suggested by previous research. Therefore, these features were used in the remaining studies to assess the effects that both subjective feelings (i.e., subjective feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance) have on well-being.

Study 1 also identified two additional features that are indirectly supported by past research. *Extrinsic motivation*, which refers to the motivation for a behavior that results from external sources (e.g., it is required by an employer) as opposed to personal reasons (e.g., it is fun and enjoyable). The notion that extrinsic motivation would be a feature of busyness is indirectly supported by research on flow states. Specifically, past research demonstrates that engaging in intrinsically-motivated activities (i.e., the antithesis of extrinsically motivated activities) can produce the psychological state of flow, which is

characterized by both disrupted perceptions of time and increased positive affect. Moreover, extrinsic motivation can decrease the enjoyment and meaning people extract from activities, which also supports its identification as a negative feature of busyness. It is also reasonable that *multi-tasking* (i.e., attempting to engage in multiple tasks simultaneously) was identified as a feature of busyness, since it can potentially alter perceptions of time and affective states. Specifically, multi-tasking often requires an individual to shift attention between multiple tasks, which can increase perceptions of goal conflict (Brown, 2006; Brown & Merchant, 2007; Field & Groeger, 2004; Zakay, 1998). These perceptions of goal conflict can lead to negative affect and also influence perceptions of time, thus supporting their inclusion as a feature of busyness.

## Study 2

The results from Study 1 demonstrated that individuals primarily construe “busyness” as negatively-valenced and that these construals often contain at least one of five different features. Study 2 built on this work by assessing how the features identified in Study 1 are associated with well-being. Specifically, *subjective feelings of time scarcity*, *the number of hours worked*, and *both subjective and objective work-life balance* were chosen to assess this relationship with well-being for two main reasons: 1) these features represent the two components of busyness proposed in previous research, which include *subjective feelings* (i.e., feelings of time scarcity and perceptions of work-life balance) and *objective time use* (i.e., number of hours worked and objective work-life balance) and 2) past research has demonstrated that each of these features can each have negative affective

consequences. Although past work has provided initial evidence of the negative affective consequences of these features individually, to the best of my knowledge, Study 2 is the first to explicitly define them as features of busyness and to investigate their independent effects on well-being when assessed simultaneously. Moreover, Study 2 demonstrated how well-being is affected by these features while controlling for individual differences in specific personality traits (i.e., extraversion and neuroticism) that might be expected to influence feelings of busyness, well-being, or the relationship between the two. For example, extraversion is a personality trait that is characterized by an orientation toward the outer world (e.g., people and other external stimuli) as opposed to internal experiences (Costa & McCrae, 1995; DeYoung, Quilty, & Peterson, 2007; McCrae, 1990). Two important facets of extraversion are “activity” (i.e., always being in a hurry) and “positive emotions” (i.e., experiencing positive affect often and intensely). Since it is possible for “activity” and “positive emotions” to affect reports of busyness and well-being, respectively, I statistically controlled for their effects. Neuroticism is a personality trait characterized by heightened responsiveness to threats, emotional extremes and fluctuations, and a propensity to experience negative feelings and emotions (Costa & McCrae, 1995; Digman, 1997; Goldberg, 1993; McCrae, 1990). Two important facets of neuroticism are “vulnerability” (i.e., the inability to cope with crises) and “depression” (i.e., holding negative attitudes such as life being bleak or hopeless). Since “vulnerability” and “depression” could potentially influence both reports of busyness and well-being, I statistically controlled for their effects in order to provide a more accurate understanding of the effects subjective feelings (i.e., feelings of time scarcity and perceptions of work-

life balance) and objective time use (i.e., number of hours worked and objective work-life balance) have on well-being.

## **Method**

**Participants.** The sample consisted of seven hundred and seventy-seven Cornell University undergraduates (516 women), which resulted in a statistical power of .99 for my primary analyses. The mean age of the sample was 20 years ( $SD = 2.56$ ). The racial composition of the sample was 52% White, 31% Asian/Pacific Islander, 8% Latino, 5% Black, and 4% other ethnicities. As compensation for their participation, participants were entered into a raffle for the chance to win a \$25 gift card to the Cornell Book Store.

**Procedure and Materials. *Overview and Design.*** Participants were recruited to complete an online survey. The survey consisted of a number of measures included by researchers working on independent projects, but only the measures relevant to the present study are presented below. Specific to the present study, participants responded to questions designed to measure their objective time use, subjective feelings about their time, and their well-being. Participants were entered into the raffle upon completing the survey.

***Subjective feelings.*** Based on the findings from Study 1, participants' construals of busyness revealed two factors related to subjective feelings. Thus, the present study measured both subjective feelings of time scarcity and subjective perceptions of work-life balance.

***Feelings of Time Scarcity.*** In order to measure participants' feelings of time scarcity, they responded to the following question: "*When you think about all the things you need to do NEXT week, do you feel like you have....*" using a 7-point likert scale (1 = not enough time; 4 = enough time; 7 = more than enough time). Specifically, they chose

the number that best represented the feelings of time scarcity they experienced in their own lives.

***Perceptions of Work-Life Balance.*** In order to assess participants' perceptions of the work-life balance in their own lives, participants first read the following question: "*How close to your ideal is your current balance between time spent on work and other aspects of your life (family, friends, hobbies)?*" They then indicated their response by choosing a number from a 7-point likert scale (1 = far from ideal; 4 = somewhat ideal; 7 = completely ideal) that best represented how they perceived the balance between work and life in their own lives. Participants' responses were then reverse coded so that larger numbers indicated increased perceptions of an imbalance between work-related and nonwork-related time use. This question was adapted from a previously established measure of work-life balance developed by Haar (2013) that focuses on one's subjective satisfaction with their work-life balance.

***Objective time use.*** The findings from Study 1 revealed that participants construe busyness in terms of two factors related to their objective time. Thus, participants reported their number of working hours and the objective balance between their work-related and nonwork-related time use.

***Number of Hour Worked.*** The number of hours worked was identified in Study 1 as a feature of busyness related to objective time use. Working hours were assessed by asking participants to report *the number of hours they spend on work-related activities on a typical workday*. The reported number was then used as a direct measure of objective working hours.

**Objective Work-Life Balance.** The objective balance between work-related and nonwork-related time use was another feature of busyness related to objective time use that was identified in Study 1. Participants' responses to the following questions were used to create a measure of objective work-life balance: *The number of hours typically spent on work-related activities, on planned leisure activities, and that are left unscheduled during a typical day.* A measure of objective work-life balance was then created by dividing the number of hours spent on work-related activities by the combined number of hours that were spent on planned leisure activities or left unscheduled.

**Life Satisfaction.** Life satisfaction is an important component of well-being. In this study, life satisfaction was assessed using one item from the satisfaction with life scale (SWLS) (Diener et al., 1985). Specifically, participants were asked to respond to the following question: *"To what degree do you agree with the following statement: 'I am satisfied with my life?'"* using a 7-point likert scale (1 = strongly disagree; 4 = neither agree nor disagree; 7 = strongly agree).

**Data Analytic Strategy.** To address whether subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) are predictive of life satisfaction above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance) two main types of analyses were conducted. First, four separate correlations were carried out. Specifically, correlations were computed and compared between the two features related to subjective feelings and life satisfaction, as well as the two features related to objective time use and life satisfaction. Second, several regression analyses were conducted to assess the variance of life satisfaction explained by the different features of busyness. Specifically, the first regression analysis assessed how a model

containing all four of the busyness-related features predict well-being, while also revealing the independent contribution of each. To assess the effects of objective time use, I performed a regression analysis with *number of hours worked* and *objective work-life balance* as the predictors and life satisfaction as the dependent variable. Moreover, I assessed the predictive ability of objective time use (i.e., number of hours worked and objective work-life balance) independent of subjective feelings (i.e., feelings of time scarcity and perceived work-life balance) by running a 2-step regression analysis. Specifically, the first step of the model included feelings of time scarcity and perceived work-life balance as predictors and well-being as the dependent variable, and then added number of working hours and objective work-life balance as predictors in the second step in order to demonstrate the change in r-square resulting from the inclusion of the objective time use features in the model. Similarly, I assessed the effects of subjective feelings by performing a regression analysis with *feelings of time scarcity* and *perceived work-life balance* as the predictors and life satisfaction as the dependent variable. I also assessed the predictive ability of subjective feelings (i.e., feelings of time scarcity and perceived work-life balance) independent of objective time use (i.e., number of hours worked and objective work-life balance) by running a 2-step regression analysis. The first step included *number of working hours* and *objective work-life balance* as predictors and life satisfaction as the dependent variable. Then the effect of subjective feelings on well-being above and beyond the effects of objective time use was assessed by adding *feelings of time scarcity* and *perceived work-life balance* as predictors and assessing the change in r-squared. All of the results reported in the present study were computed while statistically controlling for individual differences in personality traits that could potentially have influenced the results.

## Results

**Correlations with life satisfaction.** Correlational analyses were conducted as an initial assessment of how subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours work and objective work-life balance) each relate to life satisfaction. Specifically, the results demonstrated that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) are associated with life satisfaction, while objective time use (i.e., number of hours work and objective work-life balance) is not. When assessing the relationship between subjective feelings and life satisfaction, the results indicated that well-being is negatively correlated with both feelings of time scarcity ( $r=-.19$ ) and perceptions of work-life balance ( $r=-.36$ ). But when assessing the relationship between objective time use and life satisfaction, the results indicated that life satisfaction was not significantly correlated with the number of hours worked ( $r=.001$ ) nor the objective balance between work-related and nonwork-related time use ( $r=-.03$ ).

Table 2.1 Zero order correlations between life satisfaction and both subjective and objective features of busyness (Study 2).

Variable	M	SD	r	95% CI
Life satisfaction	4.90	1.51		
Feelings of time scarcity	5.06	1.49	-.19***	[-.26, -.12]
Perceived work-life balance	4.45	1.40	-.36***	[-.42, -.3]
Objective hours worked	8.97	3.35	.001	[-.07, .07]
Objective work-life balance	1.45	0.95	-.03	[-.1, .04]

*Note.* M and SD are used to represent mean and standard deviation, respectively. r = Pearson coefficient, \*\*\*  $p<.001$ .

**Explaining life satisfaction.** After investigating how subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours work and objective work-life balance) related to life satisfaction, I was next interested in the degree to which each of these four features of busyness helped explain participants' satisfaction with their life. As a main test of each feature's importance, I conducted a regression analysis in which the effects of each feature were considered simultaneously. This initial test demonstrated that both subjective feelings-related factors were significant predictors of life satisfaction, while both objective time use-related factors were not. Specifically, life satisfaction was predicted by feelings of time scarcity,  $\beta=-.1$ ,  $SE=.04$ ,  $t(770)=-2.71$ , 95% CI [-.17, -.03],  $p<.01$ , and perceptions of work-life imbalance,  $\beta=-.35$ ,  $SE=.04$ ,  $t(770)=-9.68$ , 95% CI [-.46, -.3],  $p<.001$ . However, life satisfaction was not significantly predicted by either number of working hours,  $\beta=.06$ ,  $SE=.02$ ,  $t(770)=1.30$ , 95% CI [-.02, .07],  $p=.2$  or the objective balance between work-related and nonwork-related time use,  $\beta=.04$ ,  $SE=.08$ ,  $t(770)=0.88$ , 95% CI [-.09, .22],  $p=.38$ .

Table 2.2 Variance in life satisfaction explained by subjective feelings and objective time use.

<b>Variable</b>	<b><math>\beta</math></b>	<b>SE</b>	<b>95% CI</b>
Life satisfaction			
Feelings of time scarcity	-.1**	.04	[-.17, -.03]
Perceived work-life balance	-.35***	.04	[-.46, -.3]
Objective hours worked	.06	.02	[-.02, .07]
Objective work-life balance	.04	.08	[-.09, .22]

Note. \*  $p<.01$  \*\*\*  $p<.001$ .

Importantly, when the combined effects of the subjective feelings-related factors and objective time use-related factors were used to predict life satisfaction, the model explained a significant amount of the variation in participants' life satisfaction,  $F(4,766)=32.19$ ,  $p<.001$ ,  $r^2=.14$ .

I was also interested in the independent effects of objective time use (i.e., number of hours work and objective work-life balance) both when excluding subjective feelings and when controlling for the influence of subjective feelings. When assessing the effect of objective time use while excluding the effects of subjective feelings, the combined effect of the number of hours worked and the objective balance between work-related and nonwork-related time use did not significantly predict life satisfaction,  $F(2,768)=.75$ ,  $p=.47$ ,  $r^2=.002$ . Moreover, their effect on life satisfaction above and beyond subjective feelings of busyness was almost negligible,  $r^2=.01$ .

Given the predicted importance of subjective feelings, I also investigated how life satisfaction is influenced by these feelings without considering the effects of objective time use, as well as their effects when controlling for the effects of objective time use. The results revealed that the combined effect of subjective feelings of time scarcity and perceptions of work-life balance (independent of objective time use) significantly influences participants' life satisfaction,  $F(2,769)=60.12$ ,  $p<.0001$ ,  $r^2=.14$ . Moreover, the combined influence of these two subjective feelings-related factors above and beyond the effects of objective time use also significantly explained participants' satisfaction with their lives, change in  $r^2=.14$ .

## **Discussion**

Study 2 was designed as an initial investigation of how well the variation in people's life satisfaction is explained by both the subjective feelings-related features (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use-related features (i.e., number of hours worked and objective work-life balance) identified in Study 1. Supporting the main hypothesis, the assessment of each of the four factors simultaneously provided initial evidence that both subjective feelings-related features were important in determining life satisfaction, while both of the objective time use-related features were not. Providing additional support for this finding, I found that the independent effects of objective time were not important for an individual's life satisfaction. Instead, an individual's subjective feelings about their time and work-life balance were the main business-related features that influenced life satisfaction. Importantly, the effects reported in this study demonstrated the relationships between life satisfaction and both subjective feelings and objective time use independent of individual differences in participants' personality traits that could be expected to influence their relationship. Specifically, these effects took into consideration any influence that a participant's level of extraversion (i.e., a personality trait characterized by high activeness and positive emotions) or neuroticism (i.e., a personality trait characterized by negative reactions to stressful situations and general fluctuations in mood) might have otherwise had on their subjective feelings, life satisfaction, or the relationship between the two. In sum, Study 2 provided initial evidence that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) are important in determining an individual's

life satisfaction, regardless of that individual's objective time use (i.e., number of hours worked and objective work-life balance).

### **Study 3**

Study 2 provided initial evidence that subjective feelings are influential for life satisfaction above and beyond other effects of objective time use, but the data were collected from a sample that consisted exclusively of undergraduate and graduate students from Cornell University. Moreover, many of the variables were assessed using single-items, which has the potential to decrease sensitivity and reliability. However, past research has provided evidence that single-time assessments (and shorter scales more generally) can often be sufficient and as statistically predictive as full measures (Bergkvist & Rossiter, 2007; Cunny & Perri, 1991; Drolet & Morrison, 2001; McKenzie & Marks, 1999). This ought to apply to the focal variables of the present work as well (i.e., subjective feelings of time, objective time use, and life satisfaction). The two features related to subjective feelings of time are based on an individual's subjective experience, which can often be assessed with a single direct question. The two features related to objective time use are based on the number of hours people spend on particular activities, therefore only require a single, numerical response. Furthermore, past research has explicitly demonstrated that single-item assessments of satisfaction are as statistically predictive as multiple-item measures (Hyland & Sodergren, 1996; Ittner & Larcker, 1998; Scarpello & Cambell, 1983). Therefore, the use of single-item measures is justified, but Study 3 also recruited a larger sample in order to increase statistical power and the demographic diversity of the sample. Increasing the diversity of the sample also allowed me to assess whether the relationships between both subjective feelings and objective time use and life satisfaction

are ubiquitous among people living in the United States, or whether this relationship is specific to students at Cornell University. The participants in the present study differed by gender, age, parental status, income, geographic region (i.e., Northeast, South, Midwest, and West), and living environment (i.e., rural, suburban, and urban).<sup>1</sup>

## **Method**

**Participants.** One thousand four hundred and twenty-three participants (526 women) were recruited using Google Consumer Survey (GCS), resulting in a semi-nationally representative sample that differed by gender, age, parental status, income, geographic region (Northeast, South, Midwest, West), and living environment (rural, suburban, urban). Since this was a more representative sample, age ranges were used instead of specific ages. The percentage of participants from each age bracket was as follows: 13% 18-24, 20% 25-34, 14% 35-44, 17% 45-54, 20% 55-64, and 16% 65+. I was also able to assess how many participants came from each geographic region of the United States: 37% Midwest, 15% Northeast, 26% South, 22% West. Similarly, the sample consisted of participants who lived in different types of environments: 13% rural, 47% Suburban, and 40% urban. The statistical power for the primary analyses was .99. All participants were recruited via Google Consumer Surveys, which is a survey tool that offers people access to webpages that would normally require a paid subscription if they are willing to complete a brief survey. If participants consented to completing the survey, the questions automatically appeared on top of their web browser. After completing the survey questions, participants were granted free access to the web page that they were initially attempting to view.

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<sup>1</sup> Although parental status was measured, a large number of participants did not report their status. Therefore, it was not controlled for when conducting the correlational or regression analyses.

**Procedure and materials. Overview.** Participants were recruited via Google Consumer Surveys to complete a brief survey consisting of self-report questions. Specifically, participants were asked to report their subjective feelings of time scarcity, subjective perceptions of work-life balance, life satisfaction, and the number of hours they spent that day (or will spend that day) engaging in work-related activities, leisure-related activities, or that were left unscheduled. Participation was voluntary and participants received their compensation directly after completing the survey questions.

**Subjective feelings-related factors.** As in Study 2, Study 3 measured the two factors of busyness identified in Study 1 as being related to subjective feelings: feelings of time scarcity and perceptions of work-life balance.

**Feelings of time scarcity.** Participants' indicated their feelings of time scarcity using the same question from Study 2.

**Perceptions of work-life balance.** Perceptions of work-life balance were measured using the same question from Study 2.

**Objective time use-related factors.** Like in Study 2, Study 3 measured the two factors of busyness identified in Study 1 as being related to participants' objective time use: the number of hours they worked and the objective balance between their work-related and nonwork-related time use.

**Number of hours worked.** Objective busyness was measured using the same question used in Study 2.

**Objective work-life balance.** Objective work-life balance was measured by the same questions from Study 2 to construct the proportion of time each participant spent on work-related activities, leisure-related activities, and that was left unscheduled.

**Life Satisfaction.** Life satisfaction was measured using the same item used in Study 2, which is a single question from the Satisfaction with Life Scale (Deiner et al., 1985). Specifically, participants were asked to respond to the following question: “*To what degree do you agree with the following statement: ‘I am satisfied with my life?’*” using a 7-point likert scale (1 = strongly disagree; 4 = neither agree nor disagree; 7 = strongly agree).

**Data Analytic Strategy.** The data analytic strategy used to assess the relationship between and influence of subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of working and objective work-life balance) on life satisfaction was identical to that used in Study 2 except for one difference: the analyses were conducted while controlling for the effects of participants’ age, gender, income, geographic region, and living environment.

## **Results**

**Correlations with life satisfaction.** I was first interested in whether and to what degree life satisfaction was correlated with subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance). The present findings demonstrated that life satisfaction was negatively correlated with subjective feelings, replicating those reported in Study 2. Specifically, life satisfaction was negatively correlated with feelings of time scarcity ( $r=-.29$ ) and perceptions of work-life balance ( $r=-.49$ ). Moreover, the relationship between life satisfaction and objective time use also replicated the findings from Study 2. Specifically, the results demonstrated that life satisfaction was not significantly correlated with the number of hours an individual works ( $r=.05$ ) or their objective work-life balance ( $r=-.04$ ).

Table 2.3 Zero order correlations between life satisfaction and both subjective and objective features of busyness (Study 3).

Variable	M	SD	r	95% CI
Life satisfaction	5.13	1.63		
Feelings of time scarcity	4.03	1.67	-.29***	[-.34, -.24]
Perceived work-life balance	3.62	1.57	-.49***	[-.53, -.45]
Objective hours worked	8.06	3.31	.05	[-.001, .101]
Objective work-life balance	2.09	1.65	-.04	[-.09, .01]

*Note.* M and SD are used to represent mean and standard deviation, respectively. r = Pearson coefficient, \*\*\*  $p < .001$ .

**Explaining life satisfaction.** The present study also investigated the amount of variance in participants' life satisfaction that was explained by subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and objective time use (i.e., number of hours worked and objective work-life balance). I first assessed the effect of each factor identified in Study 1 by considering their effects simultaneously. Overall, Study 3 revealed that both subjective feelings-related factors of busyness (i.e., feelings of time scarcity and perceptions of work-life balance) explained a significant amount of the variance in life satisfaction. Surprisingly, the number of hours worked also explained a significant amount of the variance in life satisfaction, while objective work-life balance did not. Specifically, the variation in life satisfaction was explained by feelings of time scarcity,  $\beta = -.09$ ,  $SE = .03$ ,  $t(1422) = -3.25$ , 95% CI [-.14, -.03],  $p < .001$  and subjective feelings of work-life imbalance,  $\beta = -.45$ ,  $SE = .03$ ,  $t(1422) = -16.66$ , 95% CI [-.41, -.52],  $p < .001$ . In terms of objective time use, participants' life satisfaction was significantly explained by the number of hours an individual spends working,  $\beta = .1$ ,  $SE = .02$ ,  $t(1422) = 3.45$ , 95% CI [.02, .08],  $p < .001$ , but not by the objective balance between their

work-related and nonwork-related time use,  $\beta=-.003$ ,  $SE=.03$ ,  $t(1422)=-.08$ , 95% CI [-.06, .06],  $p=.93$ . Importantly, when the combined effect of both subjective feelings-related factors and objective time use-related factors was used to predict life satisfaction, there combined effect explained a significant amount of the variance in participants' life satisfaction,  $r^2=.25$ .

Table 2.4 Variance in life satisfaction explained by subjective feelings and objective time use.

<b>Variable</b>	<b><math>\beta</math></b>	<b>SE</b>	<b>95% CI</b>
Life satisfaction			
Feelings of time scarcity	-.09***	.03	[-.14, -.03]
Perceived work-life balance	-.45***	.03	[-.52, -.41]
Objective hours worked	.1***	.02	[.02, .08]
Objective work-life balance	-.003	.03	[-.06, .06]

Note. \*\*\*  $p<.001$ .

I was also interested in the effect of objective time use (i.e., number of hours worked and objective work-life balance) on life satisfaction when assessed independently and also when controlling for the effects of subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance). Surprisingly, objective time use did explain a significant amount of variation in participants' life satisfaction,  $F(7,1416)=3.22$ ,  $p<.01$ , but its contribution was low,  $r^2=.01$ . Moreover, participants' life satisfaction that was explained by their objective time use above and beyond their subjective feelings was almost negligible, change in  $r^2=.01$ . Given the hypothesis that subjective feelings are more influential for life satisfaction than objective time use, I investigated the effect of these subjective feelings excluding the effect of objective time use and also while controlling for their effects. When excluding the effects of objective time use, subjective feelings were a

significant determinate of life satisfaction,  $r^2=.24$ ,  $F(7,1415)=65.23$ ,  $p<.0001$ . Importantly, the current findings demonstrated that the variation in participants' life satisfaction explained by subjective feelings above and beyond the effects of objective time use was also significant, change in  $r^2=.24$ .

## **Discussion**

Study 3 replicated the important effect that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) had on life satisfaction in Study 2. Interestingly, the effects of objective time use demonstrated in the present study differed from those reported in Study 2 in one way: the number of hours worked had a significant effect on the variation in life satisfaction between participants. Despite this difference, life satisfaction was still negatively correlated with both number of hours worked and objective work-life balance. Moreover, the amount of variance in participants' life satisfaction was not significantly explained by objective work-life balance. Since the relationship between life satisfaction and subjective feelings was unaffected by demographic factors (i.e., gender, age, parental status, income, geographic region, and living environment) and also remained significant when controlling for objective time use, these results suggest that decreases in life satisfaction associated with being busy might be difficult to attenuate by changing behaviors or the features of a situation. Instead, attempts to regulate these negative affective consequences might be most effective if focused on altering the subjective experience of being busy or expectations regarding how being busy ought to affect well-being.

## Study 4

Studies 2 and 3 demonstrated that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) are predictive of life satisfaction above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance). Building on these findings, Study 4 aimed to further explore the relationship between these subjective features of busyness and well-being in several ways. First, the data from Studies 2 and 3 were collected via online surveys that prompted participants to think about events occurring in their lives next week (vs. occurring in-the-moment). This means that participants' subjective feelings of busyness were based on more abstract, temporally distant events. Since abstract (vs. concrete) events are often less affectively charged (Metcalf & Mischel, 1999; Mischel, Shoda, & Rodriguez, 1989; Trope & Liberman, 2002), it is possible that the negative relationship between subjective feelings of time scarcity and well-being observed in Studies 2 and 3 would actually be stronger if it was assessed during the event itself. Therefore, Study 4 increased ecological validity by recruiting participants who were currently working at an on-campus library and assessed subjective feelings of busyness related to the work in which they were currently engaged, which could potentially lead to a stronger effect due to the increased salience and concreteness of the events. We also assessed subjective feelings of busyness by measuring feelings of time pressure (vs. time scarcity), since past work has defined time pressure as feelings of time adequacy in relation to a current task (Feather & Volkmer, 1988; Pruitt & Drew, 1969). Second, since Studies 2 and 3 did not find objective time use to be a significant predictor of life satisfaction, Study 4 focused solely on subjective feelings (i.e., feelings of time pressure). Third, while Studies 2 and 3 had focused exclusively on the

effects that these subjective feelings had on life satisfaction, Study 4 assessed well-being by measuring both of its important components (i.e., mood and life satisfaction). Mood and life satisfaction are not only assessed with different measures, but they also have been shown to arise from different processes. Specifically, while life satisfaction is based on individuals' cognitive assessments of how satisfied they are with their lives, mood is determined by individuals' moment-to-moment affective reactions to situations in their environment. Thus, it is important to directly test whether these subjective feelings of busyness decrease mood in addition to life satisfaction.

## **Method**

**Participants.** One hundred and twenty-three participants (women=74) were recruited while working at an on-campus library at Cornell University, which reached a statistical power of .82 for the primary analyses. Participants were only recruited if they were currently working at a desk or table as opposed to standing in the lobby or in the café, ensuring that they were working directly before completing the survey. The participants in the sample had a mean age of 21 years ( $SD=2.58$ ). The sample had a racial makeup in which the participants were 56% White, 25% Asian/Pacific Islander, 9% Black, 7% Latino, and 3% other. Participants received snacks (e.g., candy or cookies) as compensation for completing the survey.

**Procedure and materials. *Overview and Design.*** Research assistants recruited participants who were currently working at an on-campus library to complete a brief (< 2 minute) survey. In order to reduce potential selection bias, research assistants recruited participants from every floor of three different on-campus libraries. After providing informed consent, participants completed a pen and paper survey in which they were asked

to report their current positive affect, negative affect, life satisfaction, and subjective feelings of time pressure. These questions were counterbalanced, but the order of their presentation did not influence the pattern of results reported below. Participants were compensated after completing the survey.

***Subjective feelings of time pressure.*** Since Study 4 was designed to test the effects of subjective feelings of busyness related to an immediate task, I measured subjective feelings of time pressure. Specifically, these subjective feelings of time pressure were measured by asking participants to respond to the following question: “*How much time pressure do you currently feel?*” by indicating the number that best represented their own feelings using a 10-point Likert scale (1 = none; 5 = some; 10 = very much).

***Well-being.*** I was interested in how subjective feelings related to tasks being completed in the moment influenced well-being. To assess well-being, I measured both mood (i.e., the affective component) and life satisfaction (i.e., the cognitive component), since both have been demonstrated to contribute to well-being.

***Life Satisfaction.*** To assess the cognitive component of well-being, I measured life satisfaction using an item from the Satisfaction with Life Scale (Diener et al., 1985). Specifically, participants were asked to respond to the following question: “*To what degree do you agree with the following statement: ‘I am satisfied with my life?’*” by indicating the number that best represents their own feelings using a 9-point Likert scale (1 = strongly disagree; 5 = neither agree nor disagree; 9 = strongly agree).

***Mood.*** To assess the affective component of well-being, I measured mood by asking participants to report their current feelings of positive and negative affect. Specifically, participants were asked to respond to the following questions: “*How good do*

*you currently feel?*” and “*How bad do you currently feel?*” by choosing the number that best represented their current feelings from a 9-point Likert scale (1 = not at all; 5 = somewhat; 9 = very).

**Data Analytic Strategy.** The statistical analyses performed in Study 4 were the same as those carried out in Studies 2 and 3 (i.e., correlation and regression). However, the overall analytic approach differed in two ways. First, subjective feelings of time pressure was the only predictor variable (i.e., perceptions of work-life balance, number of hours worked, and objective work-life balance were not measured). Second, well-being was assessed by measuring both mood (i.e., its affective component) and life satisfaction (i.e., its cognitive component). Specifically, mood was assessed by measuring participants’ current feelings of both positive affect and negative affect. Since positive and negative affect were correlated ( $r=.77$ ), had a Cronbach’s alpha of .86, and the results for both positive and negative affect were similar when assessed separately, an aggregate mood variable was created by combining positive affect and reverse-coded negative affect.

## **Results**

**Correlations.** I assessed whether subjective feelings of time pressure were correlated with two important components of well-being: mood and life satisfaction. The results demonstrated that feelings of time pressure were negatively correlated with both life satisfaction ( $r=-.17$ ) and mood ( $r=-.37$ ).

**Explaining Variance.** I next investigated the degree to which variations in mood and life satisfaction were explained by feelings of time pressure. Interestingly, these feelings of time pressure significantly explained variations in mood,  $F(1,122)=18.6$ , 95% CI=[-.44, -.16],  $p<.001$ ,  $r^2=.13$ , but not life satisfaction,  $F(1,122)=3.61$ , 95% CI=[-.30, .01],

$p=.06$ ,  $r^2=.03$ . Despite feelings of time pressure not explaining a significant amount of variance in life satisfaction, the test did approach statistical significance ( $p=.06$ ).

Table 2.5 Correlations between time pressure and both life satisfaction and mood (Study 4).

<b>Variable</b>	<b>M</b>	<b>SD</b>	<b>r</b>	<b>95% CI</b>
Time pressure	6.92	1.94		
Life satisfaction	6.92	1.67	-.17 <sup>†</sup>	[-.34, -.01]
Mood	6.05	1.61	-.37**	[-.51, -.21]

*Note.* M and SD are used to represent mean and standard deviation, respectively. r = Pearson coefficient, <sup>†</sup>  $p=.06$ , \*\*  $p<.01$ .

## **Discussion**

Study 4 demonstrated that subjective feelings of time pressure were negatively correlated with both mood and life satisfaction. Moreover, these feelings of time pressure explained a significant amount of variance in participant's mood. However, these subjective feelings did not significantly explain variations in life satisfaction. This reduced effect on life satisfaction might have been caused by the procedural change in which participants were directed to focus on events occurring in their immediate environment (i.e., temporally close) as opposed to events occurring in the future (i.e., temporally distant). Since temporally close events are construed based on their concrete details (vs. temporally distant events, which are construed more abstractly), they are more likely to be affectively charged. Thus, these moment-to-moment affective feelings elicited from ongoing events could potentially have a stronger influence on participants' mood than their cognitive assessment of life satisfaction. Alternatively, the reduced effect on life

satisfaction could also have been caused by the measurement of subjective feelings of time pressure (vs. time scarcity).

### **Study 5**

The findings from Study 4 suggested that subjective feelings of time pressure arising from events in which an individual is currently engaged might be more influential for an individual's mood than life satisfaction. Study 5 was designed to further investigate how subjective feelings of busyness arising from events in the immediate environment can affect both mood and life satisfaction. Since it is possible that the reduced effect on life satisfaction was due to the measurement of time pressure (vs. time scarcity), Study 5 specifically assessed the effect of feelings of time scarcity in relation to ongoing tasks. Specifically, Study 5 assessed how subjective feelings of time scarcity explained the variation in both mood and life satisfaction experienced by an individual at multiple time points. The present data was collected via an experience sampling methodology (Larson & Csikszentmihalyi, 1983) in which participants were texted a link to a brief survey (<2 mins) 5 times each day for a 7-day period and were required to respond to the surveys within 5 minutes of receiving them. This design had many benefits. First, this design increased ecological validity, sensitivity, and reliability since multiple assessments were provided by each participant (and compared within-participants) during the natural flow of their day. This also means that participants' subjective feelings of time scarcity and well-being were measured while in multiple different situations and compared within each participant, ensuring that the relationship between these variables is not determined by individual differences in personality traits or by situational factors. Moreover, since the survey was

completed soon after it was received, it reduced inaccuracies that could result from a reliance on memory.

## **Method**

**Participants.** Participants consisted of eighty-three undergraduate students (66 women) from Cornell University who were compensated \$10 for their participation. The participants in the sample had a mean age of 21 years ( $SD=2.32$ ). The sample had a racial makeup in which the participants were 57% White, 36% Asian/Pacific Islander, 5% Black and 2% other ethnicities. Since participants were surveyed multiple times (5 times a day) over a 7-day period, 2,361 observations were collected. A power analyses indicated that the study achieved a statistical power of .99.

**Procedure and materials. *Overview and Design.*** After agreeing to participate in the study and creating an account through SurveySignal, participants completed a brief pre-study training designed to familiarize them with the specific procedures of the study. The experience sampling portion of the study began 1 day after they had completed this initial training. During the experimental portion of the study, participants received 5 texts at various times each day over the course of 7 days. Each text included a link to a brief survey consisting of 4-5 questions presented via Qualtrics Surveys. At the end of the 7-day period, participants were debriefed and compensated.

***Feelings of time scarcity.*** Feelings of time scarcity were measured in every survey. Participants reported their current feelings of time scarcity by responding to the following statement: “*I currently feel like I have \_\_\_\_\_ to do the things I have to do.*” using a 9-point likert scale (1 = *not enough time*; 5 = *enough time*; 9 = *more than enough time*).

**Well-being.** To assess well-being, we measured both mood (i.e., the affective component) and life satisfaction (i.e., the cognitive component), since both have been demonstrated to contribute to well-being.

**Mood.** Mood was assessed in every survey. It was measured by asking participants to report on their current feelings of positive and negative affect. Specifically, participants were asked to respond to the following questions: “*How good do you currently feel?*” and “*How bad do you currently feel?*” using a 7-point likert scale (1 = *not at all*; 4 = *somewhat*; 7 = *very*).

**Life Satisfaction.** Given that life satisfaction is more stable than mood and is less likely to fluctuate on an hourly basis, it was only assessed in 1 survey per day (Diener et al., 1985). As in previous studies, life satisfaction was assessed using one item from the satisfaction with life scale (Diener et al., 1985). Specifically, participants were asked to respond to the following question: “*To what degree do you agree with the following statement: ‘I am satisfied with my life?’*” using a 7-point likert scale (1 = *strongly disagree*; 4 = *neither agree nor disagree*; 7 = *strongly agree*).

**Day.** It is possible that the day on which each survey was completed could have influenced the relationship between feelings of time scarcity and well-being. Since participants completed surveys on seven different days, the day on which each survey was completed was recorded. The particular day on which the survey was completed was then accounted for in the statistical analyses by assigning a number to each day (i.e., 1=Monday, 2=Tuesday, 3=Wednesday, 4=Thursday, 5=Friday, 6=Saturday, 7=Sunday).

**Survey number.** Participants were sent five surveys each day. Since it is possible that participants’ responses could have been affected by the completion of multiple surveys

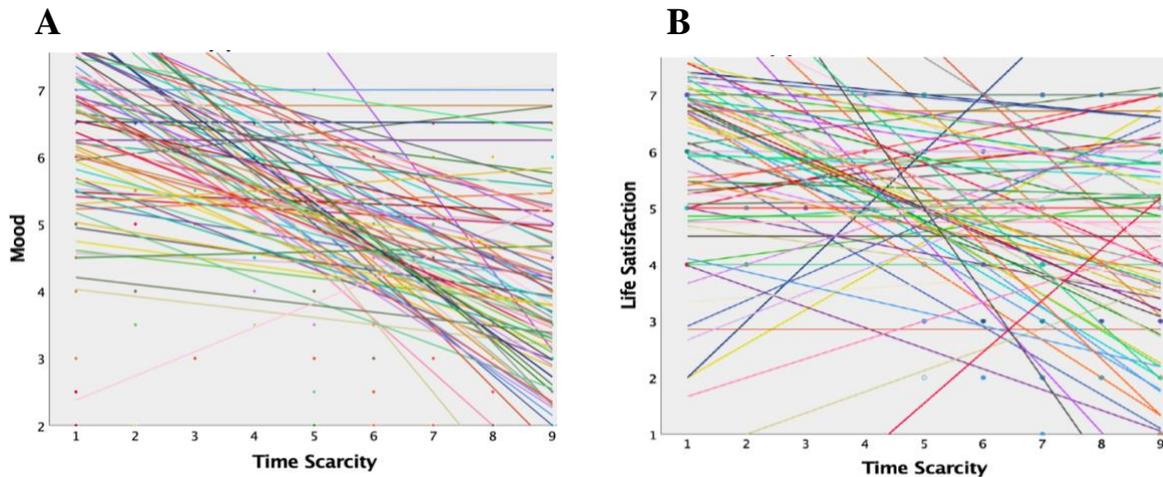
on the same day, we recorded which responses were from which number survey from each day (i.e., 1-5). Survey number was then accounted for in the statistical analyses.

**Data Analytic Strategy.** Given the nested nature of the data (i.e., day and time were nested within participant), multilevel models (MLMs) were used to assess the relationship between 1) subjective feelings of time scarcity and mood and 2) subjective feelings of time scarcity and life satisfaction. Before conducting the analyses, a single aggregate variable for mood was computed by combining scores of positive affect and reverse-coded negative affect. I was able to make this aggregate mood variable since positive affect and reverse-coded negative affect were highly correlated ( $r=.77$ ), had a Cronbach's alpha of .87, and lead to similar results when analyzed separately. To assess the relationship between subjective feelings of time scarcity and mood, I performed an MLM with subjective feelings of time scarcity as the fixed predictor and mood as the dependent variable. I treated the intercept as a random effect at the levels of participant and survey number and fixed at the level of day. Additionally, since the effect of time scarcity on mood varied significantly between participants, the slope was treated as a random effect. To assess the relationship between subjective feelings of time scarcity and life satisfaction, I performed another MLM with subjective feelings of time scarcity as the fixed predictor and life satisfaction as the dependent variable. I treated the intercept as a random effect at the level of participant and fixed at the level of day. Since the effect of time scarcity on life satisfaction also varied significantly between participants, the slope was treated as a random effect. Since life satisfaction was only assessed in one survey per day, survey number was not included in the model.

## Results

**Time scarcity and mood.** I was interested in whether moment-to-moment fluctuations in subjective feelings of time scarcity predict individuals' mood. Participants differed in their average mood ( $M=4.94$ ,  $SD=1.45$ ) and feelings of time scarcity ( $M=5.85$ ,  $SD=2.11$ ). Importantly, fluctuations in feelings of time scarcity significantly predicted mood,  $b=-.49$ ,  $F(1,75)=168.82$ , 95% CI  $[-.58, -.42]$ ,  $p<.0001$ .<sup>2</sup>

**Time scarcity and life satisfaction.** Given that mood and life satisfaction arise from different process, I also assessed whether moment-to-moment fluctuations in subjective feelings of time scarcity predict life satisfaction. At the times when both feelings of time scarcity and life satisfaction were measured (455 responses), participants differed in their average life satisfaction ( $M=5.02$ ,  $SD=1.45$ ) and feelings of time scarcity ( $M=5.87$ ,  $SD=2.11$ ). Importantly, fluctuations in feelings of time scarcity significantly predicted life satisfaction,  $b=-.36$ ,  $F(1,69.07)=45.29$ , 95% CI  $[-.46, -.25]$ ,  $p<.0001$ .<sup>3</sup>



<sup>2</sup> Feelings of time scarcity, mood, and life satisfaction were assessed on 7 different days. For simplicity, the findings reported above are based on the overall effect of time scarcity on mood, regardless of day. However, when day and the interaction between day and time scarcity were included in the model, the results indicated that the negative effect of time scarcity on both mood and life satisfaction was significantly stronger on Tuesday.

Figure 2.2 The scatterplots represent the relationship between (A) time scarcity and mood and (B) time scarcity and life satisfaction. The variables were standardized for the data analyses but are presented here as unstandardized values. Each line represents the relationship between (A) time scarcity and mood and (B) time scarcity and life satisfaction for an individual participant.

## **Discussion**

Study 5 demonstrated that at times in which people are experiencing subjective feelings of time scarcity, they are also experiencing decreases in well-being as indicated by decreased mood and life satisfaction. The results from Study 4 suggested that subjective feelings of busyness associated with current tasks (vs. future tasks) might be less influential for life satisfaction. However, Study 5 assessed subjective feelings of busyness measured in terms of time scarcity (vs. time pressure), providing evidence that subjective feelings of busyness associated with current tasks can indeed decrease both mood and life satisfaction. Importantly, the experience sampling methodology used in Study 5 controlled for additional factors (e.g., individual differences in personality traits and situational factors) that might otherwise explain the relationship between subjective feelings and well-being. Specifically, the findings were based on within-person measurements, providing initial evidence that the moment-to-moment fluctuations in subjective feelings of time scarcity directly predict well-being.

## **Study 6**

Studies 2-3 demonstrated that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) are predictive of life satisfaction above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance). Similarly, Studies 4 and 5 provided initial evidence that subjective feelings of time scarcity decrease well-being (i.e., mood and life satisfaction). Moreover, these previous studies demonstrated that this effect was not driven by individual differences in personality traits (i.e., extraversion and

neuroticism), demographic factors (i.e., age, gender, income, geographic location, or living environment), or the immediate environmental circumstances in which the data was reported. However, it is still possible that these effects were driven by individual differences between participants or situation-related factors not measured in these previous studies. Therefore, Study 6 was designed to assess a causal relationship between feelings of time scarcity and life satisfaction. Specifically, the present study experimentally manipulated participants' feelings of time scarcity in order to provide causal evidence that these subjective feelings do indeed decrease life satisfaction.

## **Methods**

**Participants.** The sample consisted of two hundred participants (93 women) recruited from Amazon Mechanical Turk, which resulted in a statistical power of .99 for the primary analysis. The mean age of the sample was 37 (SD=1.81) and the racial composition was 77% White, 11% Asian/Pacific Islander, 8% Black and 4% other. Participants were provided monetary compensation for their participation in the study.

**Procedure and materials. *Overview and Design.*** After providing informed consent, participants read one of two hypothetical prompts designed to manipulate feelings of time scarcity. In the time scarcity condition, participants read the following: "*Imagine that beginning next Monday and extending for 6 months, you will have less time each day to do the things you need to do. For example, if you would normally have 4 hours to complete 2 tasks, you would now only have 2 hours to complete those same tasks. Think about how your available time will change and how you will feel in response to that change.*" In the control condition, participants read the following: "*Imagine that beginning next Monday and extending for 6 months, you will have more time each day to do the things you need to do. For example, if it would normally only have 2 hours*

*to complete 2 tasks, you would now have 4 hours to complete those same tasks. Think about how your available time will change and how you will feel in response to that change.”* All participants then reported their anticipated feelings of time scarcity and life satisfaction following the hypothetical change.

The findings from Study 6 were based on a within-subjects design. Specifically, participants were randomly assigned to either the experimental condition (i.e., increased feelings of time scarcity) or the control condition. After completing the manipulation and reporting both feelings of time scarcity and life satisfaction, the differences between conditions were assessed with an independent sample t-test.

***Feelings of Time Scarcity.*** To assess feelings of time scarcity, participants were asked the following question: *“When you think about the change described above and how it would affect the amount of time you have to complete your typical tasks, do you feel like you would have.....”* using a 7-point likert scale (1 = not enough time; 4 = enough time; 7 = more than enough time).

***Life Satisfaction.*** Life satisfaction was assessed by asking participants the following question: *“After the scheduling change occurs, to what degree do you think you would agree with the following statement: I am satisfied with my life.”* They then chose the number that best represented their feelings using a 7-point likert scale (1 = strongly disagree; 4 = neither agree nor disagree; 7 = strongly agree).

**Data Analytic Strategy.** As a manipulation check, I assessed whether the time scarcity manipulation (vs. control) did indeed increase subjective feelings of time scarcity by conducting an independent samples t-test was performed with condition (i.e., time scarcity and control) as the independent variable and feelings of time scarcity as the dependent variable. I then assessed the causal effect of the manipulated feelings of time scarcity on life satisfaction by conducting another

independent samples t-test with condition (i.e., time scarcity and control) as the independent variable and life satisfaction as the dependent variable.

## Results

**Manipulation check.** I first assessed whether the manipulation had the intended effect on feelings of time scarcity. The results revealed that participants in the time scarcity condition ( $M=5.41$ ,  $SD=1.43$ ) did indeed experience stronger feelings of time scarcity relative to the control condition ( $M=2.57$ ,  $SD=1.28$ ),  $t(198)=14.74$ , 95% CI [2.46, 3.21],  $p<.0001$ ,  $d=2.09$ .

**Life satisfaction.** I also assessed the manipulations effect on life satisfaction. The results indicated that participants in the time scarcity condition ( $M=4.12$ ,  $SD=1.66$ ) reported decreased life satisfaction relative to participants in the control condition ( $M=5.28$ ,  $SD=1.51$ ),  $t(198)=5.18$ , 95% CI [.72, 1.61],  $p<.0001$ ,  $d=.73$ .

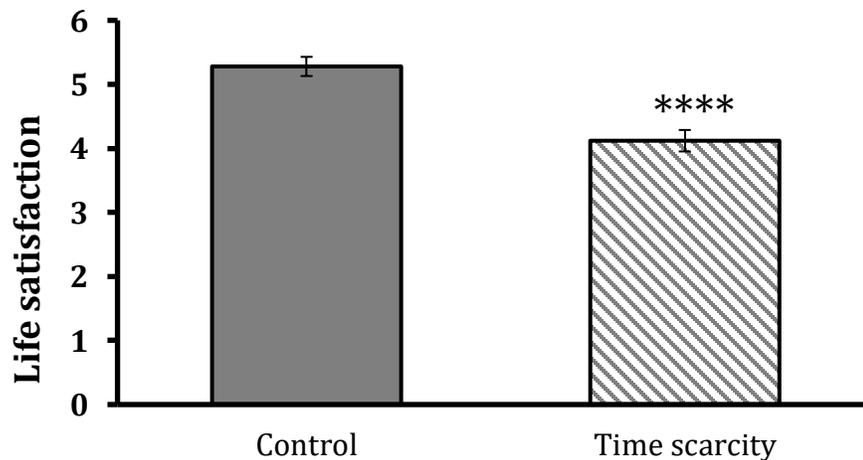


Figure 2.3 Time scarcity decreases life satisfaction. Data are represented by mean  $\pm$  standard error, \*\*\*\* indicates  $p<.0001$ .

## **Discussion**

Study 6 extends the findings from Studies 2-5 by providing causal evidence that subjective feelings of time scarcity decrease life satisfaction. The experimental manipulation referred to changes in the objective amount of time participants would have to complete their work-related activities. However, the manipulation led to significant differences in subjective feeling of time scarcity. Since participants were randomly assigned to conditions and these conditions led to significant differences in both feelings of time scarcity and life satisfaction, the study demonstrated that feelings of time scarcity causally decreased life satisfaction.

### **General Discussion**

The frequency with which the general public expresses “being busy” and the number of popular media sources reporting on its potentially detrimental effects has greatly outpaced the amount of attention it has received from empirical researchers. However, recent research has proposed that busyness is comprised of both an objective and subjective component, and has provided initial evidence that both components can indeed have negative affective consequences (Bohen & Viveros-Long, 1981; Burke et al. 1980; Garling et al., 2014; Kaluza, 2007; Thompson et al, 2006; Yang & Hsee, 2018). The present work advances this past research by, to the best of my knowledge, being the first 1) to use a bottom-up, qualitative approach to identify the features that people use to construe busyness and 2) to investigate the effects that the subjective features of busyness (i.e., feelings of time scarcity and perceived work-life balance) have on well-being above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance). Specifically, Study 1 demonstrated that people’s mental construals of busyness often include one or more of the following features: *number of hours worked*, *feelings of time scarcity*, *work-life balance* (both subjective and objective), *multi-tasking*, and *extrinsic motivation*. This

finding is in line with the previously proposed distinction between an objective (i.e., how time is used) and subjective component (i.e., how time is experienced) of busyness (Thompson et al., 2006; Yang & Hsee, 2018). Specifically, Study 1 found that the features used most frequently to mentally construe busyness (i.e., number of hours worked, feelings of time scarcity, and work-life balance) were independently categorized by two research assistants into features related to subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) and features related to objective time use (i.e., number of working hours and objective work-life balance). The present work also demonstrated that subjective feelings (i.e., feelings of time scarcity and perceptions of work-life balance) are predictive of well-being (i.e., mood and life satisfaction) above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance). Importantly, this work demonstrated that subjective feelings of time scarcity decreased well-being independent of an individual's personality traits (i.e., extraversion and neuroticism), their demographic background (gender, age, income, geographic region, or living environment), and the situation during which the feelings were experienced (e.g., working, eating, or spending time with friends).

### **Theoretical and empirical implications for busyness**

Previous research has proposed that busyness has two components, one related to objective time use (i.e., how people use their time) and the other related to people's subjective experience of time (i.e., how people feel about their time) (Thompson et al., 2006; Yang & Hsee, 2018). However, the field is still only beginning to build an understanding of busyness as a psychological construct. The present work identified novel features of busyness, which provide initial insights into the causes of busyness and why it can be detrimental for an individual's well-being. In line with past theorizing, the present work found that busyness can consist of features related to the

objective use of time (i.e., number of working hours and objective work-life balance) and the subjective experience of time (i.e., feelings of time scarcity and perceptions of work-life balance). Moreover, the present work demonstrated that these subjective feelings are predictive of well-being above and beyond the effects of objective time use. Importantly, the effects that these subjective feelings had on well-being were similar for all individuals, regardless of their demographic background, personality traits, or situational circumstances. This finding is important since it suggests that techniques designed to regulate busyness and its affective consequences might be most effective if they target individuals' subjective experiences of busyness as opposed to more objective situational factors (e.g., the number of hours they spend working).

Busyness is often framed negatively by the media and its negative affective consequences have been demonstrated by empirical studies, but some past work has also provided evidence that busyness might sometimes be beneficial. For example, being busy signals social status and desirability to others (Bellezza, Paharia, & Keinan, 2017; Keinan, Bellezza, & Paharia, 2019) and competence to the self, which then increases feelings of self-value and importance (Mochon, Norton, & Ariely, 2012; Perlow, 1999; Schor, 1992). Being busy is also closely associated with goal pursuit, which provides feedback to individuals in the form of positive affect (Carver & Scheier, 1981; Powers, 1973). Given this work suggesting that busyness can be viewed as either beneficial or detrimental, the present work increases our understanding of the construct of busyness by demonstrating that people at least spontaneously construe busyness in terms of its negative features. However, even with the knowledge that people spontaneously construe busyness negatively, future research should investigate whether people are capable of construing busyness positively if explicitly prompted to do so and if this positive construal can provide affective benefits.

Past work suggests that busyness might arise from both work-related and leisure-related activities. According to Tonietto and Malkoc (2016), scheduled leisure activities (vs. impromptu leisure activities) feel less free-flowing and more work-like. Specifically, scheduling leisure activities reduces the excitement normally associated with the anticipation of leisure activities and reduces the experienced enjoyment while engaging in the activities (Tonietto & Malkoc, 2016). This effect is driven by an increase in extrinsic motivation that is associated with scheduling, which can undermine intrinsic motivation (Deci, 1971; Etkin, 2016; Lepper, Greene, & Nisbett, 1973). This effect occurs because of the explicit scheduling of leisure activities, thus, it can therefore be reduced by “roughly scheduling” activities (without prespecified times). The present findings are in line with the notion that busyness can result from both work-related and leisure-related activities in several ways. First, the content of participants’ construals of busyness referred to situations and circumstances from both work and non-work domains. For example, people referred to busyness resulting from not only work, but also from family and social obligations. Second, the findings from Study 5 were collected via an experience sampling methodology. This means that participants reported on their feelings of time scarcity, mood, and life satisfaction while engaging in a wide variety of activities. The findings demonstrated that time scarcity predicted fluctuations in both mood and life satisfaction, regardless of the specific activity in which participants were currently engaged. Although the present work and the past work conducted by Tonietto & Malkoc (2016) suggest that busyness can arise from both work-related and leisure-related activities, future research ought to assess the similarities and differences between the features of these situations that lead to the negative affective consequences. Moreover, future work ought to more explicitly assess the frequency and strength of the busyness-related negative affect that results from these two different life domains.

## **The effects of busyness across cultures**

The present research provides compelling evidence that subjective feelings of time (i.e., feelings of time scarcity and perceptions of work-life balance) are predictive of well-being above and beyond the effects objective time use (i.e., number of hours worked and objective work-life balance). However, since the present findings were based on data collected from individuals living in the United States, caution should be used when considering the effects busyness might have for people living in other countries. For example, it is possible that the relationship between busyness and well-being might be different for individuals living in individualist (e.g., United States) vs. collectivist (e.g., China) cultures. Collectivist cultures are characterized by individuals who are tightly linked to others as part of a group identity and express pride, loyalty, responsibility, and cohesiveness with their groups (Markus & Kitayama, 1988; Schwartz, 1994; Schwartz, 1998). One of these important groups is family membership, and people from collectivist cultures tend to prioritize common family goals and responsibilities over personal interests and needs (House et al., 2004). Past work has demonstrated that conflict between work and other aspects of life is less detrimental to people living in collectivist cultures (Lu et al., 2006; Lu et al., 2010; Na & Kitayama, 2012; Spector et al., 2004, 2007; Yang et al., 2000) because work is viewed as a means for supporting a family as opposed to time use that is incompatible with family (Aryee et al., 1999; Redding, 1993; Redding & Wong, 1986; Spector et al., 2007). Therefore, if people from collectivist cultures view work as a way to provide for family members, then it is possible that the number of hours a person spends working or their subjective feelings of time scarcity might be less detrimental (or even beneficial) for their well-being. Given the potential for the negative relationship between busyness and well-being to differ between these cultures, future research

ought to investigate whether the affective consequences of busyness differ for people living in individualist and collectivist cultures.

### **Concluding Statement**

To my knowledge, the present research is the first to 1) use a bottom-up, qualitative approach to demonstrate that busyness is spontaneously construed in terms of its negative features and to identify the specific features by which it is construed and 2) to demonstrate that subjective feelings of busyness (i.e., feelings of time scarcity and perceptions of work-life balance) are predictive of well-being above and beyond objective time use (i.e., number of hours worked and objective work-life balance). Moreover, this relationship was observed regardless of participants' personality traits (i.e., extraversion and neuroticism), demographic background (i.e., age, gender, income, geographic location, and living environment), or immediate situational circumstances. This work suggests that the relationship demonstrated by the present findings might not be observed in people from collectivist cultures and also suggests that the negative affective consequences of busyness might be most effectively regulated by techniques that target people's subjective experience of busyness as opposed to changes in the immediate situation itself.

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### **CHAPTER III. The Bright Side of Busyness: How the subjective construal of busyness influences life satisfaction**

#### **Abstract**

Busyness has typically been operationalized in terms of its negative features and has been demonstrated to have negative affective consequences. However, there are reasons to believe that busyness might also have positive features and that construing busyness in terms of these positive features could provide affective benefits. Therefore, the present research investigated 1) whether people can identify positive features of busyness and construe busyness in terms of these positive features if they are explicitly instructed to do so and 2) whether construing busyness in terms of these positive features increases well-being. This first aim was addressed in Study 1, which demonstrated that people can indeed identify positive features of busyness and can use them to construe busyness positively if explicitly prompted to do so. Specifically, participants' positive construals of busyness revealed the following positive features: *productivity*, *activeness* (*vs. idleness*), *intrinsic motivation*, and *goal pursuit*. The second aim of the present work was investigated in Studies 2 and 3, which assessed whether construing busyness in terms of its positive features can provide affective benefits. Study 2 was designed as an initial investigation of this potential relationship. Specifically, Study 2 demonstrated that busyness is associated with both negative features (e.g., feelings of time scarcity) and positive features (e.g., productivity) and that both of these busyness-related features are significantly correlated with life satisfaction. Study 3 was designed to investigate a causal link between construing busyness in terms of its positive features (i.e., productivity) and subsequent affective benefits. Specifically, Study 3 provided causal evidence that construing busyness in terms of its positive (*vs. negative*) features causally increases mood and life satisfaction. The present research enhanced our theoretical understanding of

busyness as a construct and provided empirical evidence that people can intentionally manipulate their construal of busyness in order to increase well-being.

## **The Bright Side of Busyness: How the subjective construal of busyness influences life satisfaction**

According to popular media sources, the United States is experiencing a “busyness epidemic.” Indeed, reports from Gleick (1999) reveal that Americans are “always feeling rushed” and that this busyness is associated with decreased well-being (Menzies, 2009). Corroborating this popular view, past research has demonstrated that working many hours can have negative effects for health and well-being (Burke et al. 1980; Schafer & Keith, 1980; Perlow, 1999; Pleck et al., 1980; Shanafelt et al., 2012; Zuzanek, 2004). Similarly, subjective feelings of busyness (e.g., subjectively experienced feelings of time scarcity or time pressure) can also negatively affect well-being. It is clear that busyness can have negative affective consequences, but there are reasons to believe that busyness might at times be positive and even provide affective benefits. Thus, the present work had two main aims: 1) to investigate whether people are capable of identifying positive features of busyness and whether they can construe busyness in terms of these positive features if instructed to do so and 2) to assess whether construing busyness in terms of its positive (vs. negative) features increases well-being.

### **The negative effects of busyness**

Busyness has received a significant amount of attention from popular media sources and the general public, but this has outpaced the attention it has received from empirical researchers. However, the empirical research that does exist has proposed that busyness has an objective component, which is based on the way people spend their time (e.g., the number of hours they spend working) (Yang & Hsee, 2018). Other work has demonstrated that this objective time use can influence well-being. For example, past research has demonstrated that the number of hours an individual spends working can have detrimental effects including burnout, negative physical

health outcomes, anxiety, depression, and other negative mental health outcomes (Perlow, 1999; Shanafel et al., 2012). Moreover, research has demonstrated that increases in the number of hours an individual works is an important predictor of stress (Zuzanek, 2004; Lee et al., 2017). Other work focused on objective time use has demonstrated that the balance between work-related and nonwork-related time use can have affective consequences. Specifically, the number of hours an individual works each week and the number of hours spent commuting to work both can create a work-life imbalance, which can lead to stress, burnout, depression, and a dissatisfaction with life (Bohen & Viveros-Long, 1981; Burke et al. 1980; Schafer & Keith, 1980; Pleck et al., 1980).

In addition to the objective component (e.g., how time is used), researchers have proposed that busyness has a subjective component as well (e.g., how time is experienced and how long time feels) (Thompson et al., 2006; Yang & Hsee, 2018). These subjective perceptions of time are not based on objective situations factors, but instead are influenced by psychological factors including arousal, attention allocation, emotional states, and cognitive representations of tasks and time (Csikszentmihalyi & Hunter, 2003; Etkin, Evangelidis, & Aaker, 2015; Maslow, 1964; Moskowitz et al., 2015; Rudd, Vohs, & Aakers, 2012; Zakay, 1992, 1998). These subjective perceptions of time pressure have been demonstrated to negatively impact an individual's mood (Garling et al., 2014) and can increase stress and decrease well-being (Kaluza, 2007). Similarly, people who report feeling overworked show increases in physiological markers of stress, such as cortisol levels (Frankenhaeuser et al., 1989; Schlotz et al., 2004). The affective consequences of these subjective feelings are clear, but work investigating the affective consequences of work-life balance and the findings presented in Chapter II have suggest that these subjective feelings (e.g., feelings of time scarcity) are even stronger predictors of well-being than objective time use (e.g., number of hours worked) (Haar et al., 2016; Kossek et al., 2014; Maslach, 2003; Maslach & Leiter, 2016). In sum,

research on the negative affective consequences of both previously proposed components of busyness (i.e., objective time use and subjective feelings) provide empirical support for the common perception that busyness is negative and can have detrimental effects for well-being.

### **Potentially positive effects of busyness**

It is common for busyness to be construed in terms of its negative features and negative affective consequences (Frankenhaeuser et al., 1989; Garling et al., 2014; Kaluza, 2007; Schlotz et al., 2004). Indeed, busyness resulting from either objective time use (e.g., working many hours) or the subjective experience of time (e.g., feelings of time scarcity) can be detrimental for an individual's psychological and physical health. However, busyness can also have social benefits, that is, being busy can send a positive social signal to others. Specifically, when an individual is perceived by others as busy, it is assumed that the individual must be valued and in-demand (Bellezza et al. 2016). These positive assumptions lead others to view busy people as important and high-status, thereby providing social benefits. Thus, previous work suggests that even if busyness is spontaneously viewed as negative, it is possible that it could at times be beneficial.

If being busy can provide social benefits, can it have positive effects for the self as well? Past research focused on a variety of topics including idleness aversion, flow states, goal pursuit, and time scarcity all indirectly suggest that busyness could indeed have positive features that could provide affective benefits (Carver & Scheier, 1981; Csikszentmihalyi, 1997; Eastwood et al., 2012; Hsee, Yang, & Wang 2010; Killingsworth & Gilbert, 2010; Mullainathan & Shafir, 2013; Powers, 1973; Shah, Mullainathan, & Shafir, 2012). Idleness is a state in which time passes vacantly, devoid of action, and is commonly viewed as an aversive state (Hsee, Yang, & Wang 2010; Killingsworth & Gilbert, 2010; Wilson et al., 2014). It can impair psychological and physical well-being by highlighting the waste of a primary resource (i.e., time), while also increasing feelings of

boredom and anxiety (Csikszentmihalyi, 1997; Eastwood et al., 2012; Holder, Coleman, Sehn, 2009; Osuna, 1985; Taylor, 1994). Thus, it is possible that busyness could potentially have beneficial effects when it decreases idleness. Similarly, busyness might also provide affective benefits if it is the result of successful goal pursuit. Goal pursuit involves a discrepancy reducing feedback loop (Carver & Scheier, 1981; Powers, 1973), which involves awareness of an individual's current state and desired state. When progress toward a desired end state is fast, positive affect is elicited to signal to the individual that they are performing well. This suggests that busyness resulting from successful goal pursuit could potentially provide affective benefits. If busyness associated with the process of goal pursuit could have affective benefits, then it might also have benefits associated with the outcome of successful goal pursuit. Specifically, if busyness results in increased productivity, this positive outcome could become associated with busyness as well. In fact, research on time scarcity (i.e., a negative feature of busyness identified in Chapter II) demonstrates that it can increase productivity by motivating goal-relevant behaviors and decreasing engagement with behaviors unrelated to the desired outcome (Mullainathan & Shafir, 2013; Powers, 1973; Shah, Mullainathan, & Shafir, 2012). Collectively, these findings suggest that busyness could potentially have positive features that might provide affective benefits (i.e., productivity).

### **Regulating the negative effects of subjective feelings of time scarcity**

Given the ubiquity with which people express being busy and the decreases in the quality of life associated with this subjectively experienced busyness (Frankenhaeuser et al., 1989; Garling et al., 2014; Kaluza, 2007; Schlotz et al., 2004), it is not surprising that people would want to regulate these affective responses. The present work investigated whether construing busyness in terms of its positive features (e.g., productivity) as opposed to its negative features (e.g., feelings

of time scarcity) can regulate these negative affective responses and even provide affective benefits. This approach, which is based on the appraisal processes that give rise to emotions (Gross, 1998), is contrary to existing approaches intended to regulate the negative affective consequences of busyness. Specifically, past approaches have attempted to regulate busyness-related negative affect by 1) targeting the objective circumstances (e.g., increased working hours) that lead to the negative effects and 2) by engaging in behaviors intended to regulate the negative affect after it has already been elicited. Since busyness often results from situations in which an increased number of working hours is required to attain a certain goal, past studies have focused on time management strategies that aim to help people set smaller, more specific goals (Prenda & Lachman, 2001; Sheldon et al., 2002). By setting these goals, the time management strategies can help increase work efficiency and spread any necessary overtime hours over a longer period of time (e.g., working 2 extra hours for five days vs. working 5 extra working hours from two days) (MacLeod, Coates, & Hetherington, 2008). Overall these time management strategies have had some success, leading to increased life satisfaction, positive feelings (e.g., enthusiasm and engagement), and feelings of goal-related self-efficacy (MacLeod, Coates, & Hetherington, 2008; Prenda & Lachman, 2001; Sheldon et al., 2002), but they can potentially be problematic since they require the modification of objective time use. Another approach has assessed how certain environments can help individuals to recover from the negative affective consequences of busyness after they have already occurred (Kaplan, 1995; Kaplan et al., 2013). For example, home settings, parks, and other natural landscapes have the ability to restore mental health by providing an environment that is removed both physically and mentally from the negative affect-inducing stimulus (Kaplan & Kaplan, 1989; Olmsted, 1865). However, this strategy is often ineffective since increased feelings of time pressure seem to prevent people from seeking out and spending time in the environments

that confer these restorative benefits (Garling et al., 2014). Furthermore, changes in the typical work structure that have afforded individuals more flexibility in where they work has increased how often and how many people work from their homes (Shagvaliyeva & Yazdanifard, 2014). This is problematic since working from home blurs the distinction between work and non-work, thereby eliminating any potentially restorative qualities of the home (Hartig, Johansson, & Kylin, 2003; Hill, Hawkins, & Miller, 1996).

The present work instead focused on a regulation strategy that does not require an individual to change their objective situational circumstances or to enact additional behaviors (e.g., seeking at a restorative environment) in order to regulate their detrimental responses. Specifically, the present work investigated how these negative affective responses could potentially be regulated by construing busyness in terms of its positive (vs. negative) features. This approach is based on the appraisal processes of emotion in which an individual's emotional reaction to a stimulus is determined by the way they interpret a stimulus and the meaning they extract from it (Ellsworth & Scherer, 2000; Frijda, 1986; Lazarus, 1966; Roseman, 1984; Smith & Ellsworth, 1985). Cognitive reappraisal is an emotion regulation technique that capitalizes on this appraisal process in order to modulate an affective response. Specifically, this regulation strategy attenuates the negative affect associated with a distressing situation by manipulating how the situation is mentally construed (Gross, 1998; Gross, 2002; Gross & John, 2003; Hayes et al., 2010; Wrosch et al., 2000). Original work on cognitive reappraisal often relied on procedures in which participants would reconstrue an upsetting video presented on a computer (Dillon et al., 2007; Gross, 2002; Hayes et al., 2010; Richards et al., 2003). Building on this original work and increasing ecological validity by assessing the effect in real-world situations, Jameison and colleagues (2016) demonstrated that the way an individual construes stress can have important implications for their performance

during a stressful situation. Specifically, construing stress as a beneficial tool that helps an individual attain a goal (vs. a detrimental obstacle that needs to be overcome) results in beneficial cognitions, affective responses, behaviors, and physiological reactions that increase the likelihood of successful goal attainment (Jameison et al., 2016). Given this work, we investigated whether busyness can also be construed either in terms of its negative (e.g., feelings of time scarcity) or positive features (e.g., productivity) and if construing busyness in terms of productivity will attenuate the affective consequences or even provide affective benefits. This approach could potentially be particularly beneficial since it alters an individual's affective reaction to a situation without changing the objective features of the situation or requiring the enactment of additional restorative behaviors. Moreover, the strategy can be enacted individually as opposed to other techniques like social regulation, which rely on other people for regulatory support.

### **Present Research**

The present research investigated (1) whether individuals are able to identify positive features of busyness and whether they can construe busyness in terms of these positive features if they are specifically prompted to do so and (2) whether construing busyness in terms of these positive features (e.g., productivity) vs. negative features (e.g., feelings of time scarcity) increases well-being (i.e., mood and life satisfaction). Three studies were conducted to address these aims. Study 1 assessed the first aim of the present work. Specifically, it demonstrated that people can indeed generate positive features of busyness and also construe busyness in terms of these positive features if they are prompted to do so. Additionally, Study 1 replicated past work by identifying the same negative features of busyness revealed in Chapter II. Study 2 was designed as an initial investigation into whether these positive features of busyness are correlated with people's reported busyness and how these positive features relate to well-being (i.e., mood and life satisfaction). The

results from Study 2 confirmed that busyness is indeed correlated with both negative (i.e., feelings of time scarcity) and positive (i.e., productivity) features and provided initial evidence that these features are negatively and positively correlated with well-being, respectively. Study 3 provide evidence of a causal relationship between positive features of busyness (i.e., productivity) and well-being by experimentally manipulating whether busyness was construed in terms of its positive or negative features.

### **Study 1**

The findings from Chapter II demonstrated that people spontaneously construe busyness in terms of its negative features (e.g., feelings of time scarcity and number of working hours) and its negative affective consequences. However, past work has provided initial evidence that busyness can at times provide affective benefits (Bellezza, Paharia, & Keinan, 2016; Hsee, Yang, & Wang, 2010), which suggests that busyness ought to have positive features in addition to its negative features. Building on this proposition, Study 1 investigated whether people can construe busyness as a positive (or negative) state if they are explicitly instructed to do so. Moreover, Study 1 assessed the content of these construals in order to identify the positive features of busyness while also replicating the negative features revealed in Chapter II. Importantly, open-ended questions were used to assess participants' construals of busyness. I intentionally used this bottom-up, qualitative approach to ensure that the features participants used to construe busyness were not influenced by our own views of busyness and its potential features.

### **Method**

**Participants.** The sample consisted of forty participants (17 women) recruited from Amazon Mechanical Turk. The percentage of participants from each age bracket was as follows: 26% 18-24, 46% 25-34, 18% 35-44, 5% 45-54 and 5% 55-64. The racial composition of the sample

was 46% White, 28% Asian/Pacific Islander, 10% Latino, 10% Black, and 5% other ethnicities. Participants received a monetary compensation for their participation. The number of participants was determined by the principle as saturation (see *Design* section below).

### **Procedure and materials.**

*Overview.* Two separate groups of 20 participants were recruited and asked to respond to several open-ended questions designed to assess their own personal construal of busyness. Since I was interested in both the positive and negative features people commonly use to construe busyness, I had participants complete the same procedure twice. First, they were asked to construe busyness negatively, since the results from Study 1 demonstrated that people spontaneously construe busyness in terms of negative features in the absence of more specific instructions. After responding to the questions regarding their negative construal of busyness, they then completed the same questions in relation to a positive construal of busyness. Two research assistants assessed the valence of participants' construals (i.e., positive or negative) and then grouped the responses into categories based on the features identified in the construals. Since participants responded to three different open-ended questions, it was possible for each participant's responses to be coded into multiple themes. Participants were then debriefed regarding the purpose of the study and provided monetary compensation.

*Design.* A qualitative design was used to assess whether people can construe busyness in terms of negative features and positive features separately. In the first phase of the study, 20 participants were recruited. After the responses from the first 20 participants were coded and categorized, 20 more participants were recruited. Data collection was ended after the recruitment of 40 total participants based on the principle of saturation, that is, since the responses collected from the second set of 20 participants did not reveal any additional features, data collection was

ended and no more participants were recruited (Crouch & McKenzie, 2006; Glaser & Strauss, 1967; Guest, Bunce, & Johnson, 2006).

**Construing busyness.** To assess whether people could identify both negative and positive features of busyness and whether they could construe busyness in terms of either set of features, participants completed the following procedure. First, participants read an introductory prompt: *“In everyday life, people sometimes say they are ‘busy’ or ‘feel busy.’”* Then, depending on condition, participants read the following: *“Sometimes in daily life, being busy is a GOOD (BAD) thing. We are interested in this GOOD (BAD) version of busyness.”* Next, they were asked to provide an open-ended response to each of the following six questions (3 focused to negative busyness and 3 focused on positive busyness): (1) *“How do you define this (good/bad) version of busyness?”* (2) *“Please think about the last time you experienced this (good/bad) version of busyness. Describe the specific situation below.”* (3) *“What was it about this situation that led to the experience of this (good/bad) version of busyness?”* The primary goal of the present work was to investigate how future tasks and deadlines associated with busyness can have affective consequences in the present moment. However, participants were asked to recall two separate busyness-related situations from the past (vs. future) because personal memories are likely to provide more concrete (vs. abstract) details, which would allow us to more accurately identify both the positive and negative features of busyness.

**Data Analytic Strategy.** To assess whether participants can construe busyness positively and negatively and also to identify the positive and negative features of these construals, two independent research assistants coded responses in two ways. First, participants’ responses were coded based on valence, that is, they were coded as either containing positive or negative features. For example, responses were coded as negative if the participant construed busyness in terms of

negative features (e.g., subjective feelings of time scarcity or having to work long hours) and coded as positive if the participant construed busyness in terms of positive features (e.g., productivity and goal pursuit). Second, responses were categorized based on the specific features identified in the participants' construals. The categorization of these features was completed without *a priori* assumptions, that is, the coder's categorization was not guided by a predetermined set of features. Instead, responses that contained a novel feature not previously identified in earlier responses were placed into a new group, while any responses that contained a feature that had been identified in a previous response were placed into the matching group (e.g., the first response that referred to *feelings of time scarcity* was placed into one group, while any subsequent responses that referred to this same feature were added to the matching group). Since the two research assistants who coded the responses identified the same features, both in terms of number and content, I felt confident that the categories were objectively separable. Once responses from the 40 participants were coded, another independent coder went back through each participant's responses to code for the presence of these newly identified features.

## **Results**

**Valence.** Since the findings from Chapter II demonstrated that people spontaneously construe busyness in terms of its negative features, a main aim of the present work was to assess whether participants could also construe busyness in terms of positive features if specifically prompted to do so. The results demonstrated that participants were able to construe busyness as either a negative state or a positive state when asked to define and describe it in an open-ended response. Specifically, participants' responses indicated that all 40 participants could construe busyness based on features that could clearly be categorized as positive or negative.

**Negative features of busyness.** Participant’s construals of a “bad” version of busyness identified five negative features of busyness. On average, 2.28 features were generated per participant (89 in total). Replicating the findings reported in Chapter II, participants identified the following negative features of busyness: 1) *the number of hours worked* (i.e., the number of hours spent on work-related activities or other responsibilities), 2) *feelings of time scarcity* (i.e., feeling rushed or like there is not enough time to do what needs to be done), 3) *work-life balance* (i.e., an imbalance or dissatisfaction with the balance between work-related and nonwork-related time use), 4) *multi-tasking* (i.e., engaging in multiple tasks simultaneously), and 5) *extrinsic motivation* (i.e., engaging in an activity for external reasons, such as an employer’s request). The frequency with which each negative feature was reported can be seen in Figure 3.1.



Figure 3.1 Frequency of negative features of busyness: Hours worked=29, time scarcity=22, work-life balance=19, multi-tasking=6, and extrinsic motivation=13.

**Positive features of busyness.** If people can construe busyness in terms of negative or positive features, what are the negative features by which they construe busyness? On average, participants reported 2.03 features each (total of 79). Participants generated 5 independent positive features of busyness. Specifically, they construed busyness in terms of the following positive

features: 1) *productivity* (i.e., getting things done), 2) *activeness* (i.e., engaging in activities and avoiding idleness), 3) *intrinsic motivation* (i.e., engaging in an activity for personal reasons, such as enjoyment), and 4) *goal pursuit* (i.e., engaging in behaviors in order to progress toward or attain a desired end-state). The frequency with which these positive features were reported can be found in figure 3.2.

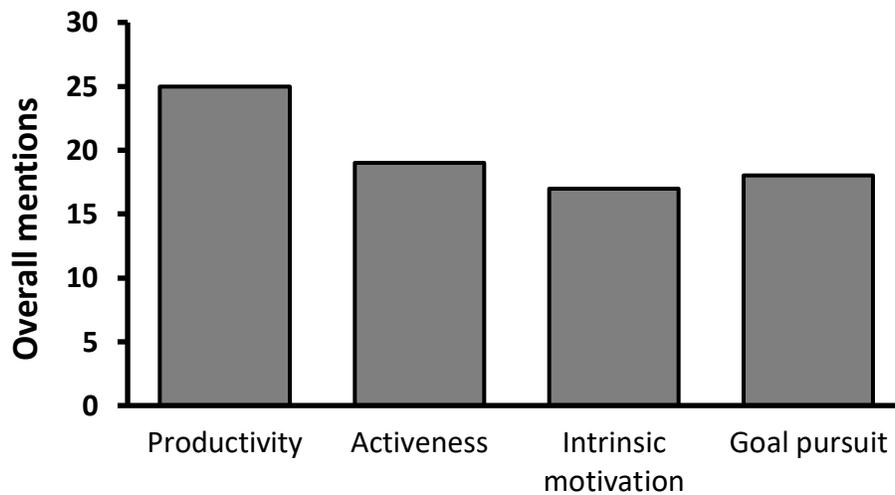


Figure 3.2 Frequency of positive features of busyness: Productivity=25, activeness=19, intrinsic motivation=17, and goal pursuit=18.

## Discussion

Study 1 assessed whether people can construe busyness not only in terms of its negative features but also in terms of its positive features. Moreover, the content of participants' construals was coded by two research assistants to identify the specific positive and negative features of busyness. Study 1 replicated the findings from Chapter II, demonstrating that people typically construe busyness in terms of the following five negative features: 1) *objective number of hours worked*, 2) *subjective feelings of time scarcity*, 3) *work-life balance*, 4) *multi-tasking*, and 5) *extrinsic motivation*. Study 1 also demonstrated that people can construe busyness in terms of its positive features if they are explicitly instructed to do so. Specifically, the research assistants who

coded these construals identified the following positive features: 1) *productivity*, 2) *activeness*, 3) *intrinsic motivation*, and 4) *goal pursuit*.

Study 1 did not verify these positive features using statistical analyses, but their validity is supported by previous findings from related literatures (Carver & Scheier, 1981; Hsee, Yang, & Wang 2010; Killingsworth & Gilbert, 2010; Mullainathan & Shafir, 2013; Powers, 1973; Shah, Mullainathan, & Shafir, 2012). The most common positive feature of busyness identified in the present work was *productivity*, which is typically defined in terms of work-related output. Productivity has been demonstrated to have affective benefits and, importantly, can result from time scarcity (Shah, Mullainathan, & Shafir, 2012). Specifically, time scarcity increases productivity by leading people to focus on and engage in goal-relevant behaviors while inhibiting distracting thoughts and behaviors (Mullainathan & Shafir, 2013; Shah, Mullainathan, & Shafir, 2012). Other work has also suggested that verbally or behaviorally demonstrating busyness can increase productivity by reducing interruptions from others (McMurdo, 1982). Thus, the identification of productivity as a positive feature of busyness is in line with past work demonstrating that productivity can result from displays of busyness and feelings of time scarcity (i.e., a previously established negative feature of busyness). *Activeness* (i.e., engaging in activities to avoid idleness) was also identified as a positive feature of busyness. This is in line with past work proposing that busyness is the theoretical antithesis of idleness, an aversive state (Eastwood et al., 2012; Franklin et al., 2013; Hsee, Yang, & Wang 2010; Killingsworth & Gilbert, 2010; Wilson et al., 2014) that can impair psychological and physical well-being by increasing feelings of boredom and anxiety and also by highlighting the waste of a primary resource (i.e., time) (Csikszentmihalyi, 1997; Eastwood et al., 2012; Holder, Coleman, Sehn, 2009; Osuna, 1985; Taylor, 1994). Moreover, idleness can lead to mind wandering, a negative affective state in which

the mind disengages from the present moment and becomes fixated on past or future events. Therefore, the identification of activeness as a positive feature of busyness is supported by work demonstrating that avoiding idleness can confer affective benefits. The present work also demonstrated that busyness is considered positive when it results from activities that are *intrinsically motivated*, that is, they are motivated by personal reasons (e.g., it is enjoyable or pleasurable) as opposed to external reasons (e.g., it is required by an employer). Engaging in intrinsically motivated activities can result in the psychological state of flow, which is a highly enjoyable and personally rewarding state characterized by a loss of time perception (e.g., time seems to “fly by”). Thus, the identification of intrinsic motivation as a positive feature of busyness is supported by research on flow states and the affective benefits associated with intrinsically motivated tasks more generally. A fourth positive feature of busyness identified in the present work was *goal pursuit*. Goal pursuit involves a discrepancy reducing feedback loop based on the awareness of an individual’s current state as well as desired state (Carver & Scheier, 1981; Powers, 1973). When progress toward the desired state occurs faster than expected, positive affect is elicited to signal progress to the individual. Similarly, when a goal is successfully attained, an individual experiences positive affect to signal the successful goal pursuit and to increase the positivity associated with the goal-related end state. Thus, the affective benefits that have been demonstrated to result from successful goal pursuit support the identification of goal pursuit as a positive feature of busyness.<sup>4</sup>

To date, surprisingly little research has investigated the various components and features of busyness. One study attempted to map the concept of busyness by measuring factors that were

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<sup>4</sup> Activeness, goal pursuit, and intrinsic motivation are similar but still distinct. Activeness refers to instances in which activities are enacted for the main purpose of avoiding idleness. In goal pursuit, activities are enacted in order to reach a specific desired end-state (e.g., a pay raise) as opposed to activities that are enacted simply to avoid idleness. Intrinsic motivation can also be associated with activeness and goal pursuit but is a subset of these other features, since activeness and goal pursuit could be the result of either intrinsic motivations or extrinsic motivations.

presumably associated with busyness and assessing their correlations (Thompson et al., 2006). Overall, this work concluded that busyness can be both subjective (i.e., perceptions of internalized pressure created by a situation where there is a shortage of time to accomplish valued work) and objective (i.e., characterized by high levels of action and motion). This finding is supported by a separate review of busyness that also concluded that busyness can be conceptualized in terms of both objective time use (e.g., how many hours an individual spends working) and subjective feelings of time (e.g., how time is perceived and experienced) (Yang & Hsee, 2018). However, the findings from these investigations are limited since they either relied on a priori assumptions to investigate the correlates of busyness or arrived at conclusions based on the synthesis of past work that was based on prior assumptions. Thus, the present findings provide novel insights into the way people construe busyness since it is the first to suggest that busyness possesses both positive and negative features.

## **Study 2**

The qualitative data gathered in Study 1 provided initial evidence that busyness can be construed in terms of either its positive or negative features, but the strength of the relationship between busyness and these features was not assessed through quantitative analyses. Therefore, Study 2 was designed to statistically assess the strength of the relationship between busyness and its positive and negative features. Moreover, Study 2 was also designed as an initial investigation of the affective consequences associated with these positive and negative features. Since past work has demonstrated that time scarcity (i.e., negative feature) and productivity (i.e., positive feature) can result from the same situation, I focused on these features to test whether busyness is indeed statistically correlated with both positive and negative features. Moreover, the present work assessed how productivity and feelings of time scarcity are each associated with life satisfaction.

Although some researchers have posited that life satisfaction is a dispositional trait (Costa & McCrae, 1980; McCrae & Costa, 1991; Pavot & Diener, 1993), it has also been demonstrated to fluctuate depending on the feature of the immediate environment (Schwarz & Clore, 1983; Schwarz & Strack, 1999). Past research informs our predictions regarding the relationship between these variables. Since time scarcity has been identified as a feature of busyness and has been demonstrated to decrease mood and increase stress and physiological markers of stress (i.e., cortisol levels) (Garling et al., 2014; Kaluza, 2007; Mullainathan & Shafir, 2013; Shah, Mullainathan, & Shafir, 2012), I expected the results to also indicate that feelings of time scarcity are positively correlated with busyness and negatively correlated with life satisfaction. Similarly, since both the objective (i.e., number of hours worked) and subjective (i.e., time scarcity) components of busyness have been demonstrated to increase productivity, I expected productivity to be positively correlated with busyness. I also expected productivity to be positively correlated with life satisfaction because it is viewed as highly valued and desirable, leading companies to spend staggering amounts of money in order to increase it (Bellezza, Paharia, & Keinan, 2017).

## **Method**

**Participants.** The sample consisted of seven hundred seventy-two Cornell University undergraduates (486 women), which resulted in a statistical power of .99 for the primary analyses. The mean age of the sample was 21 ( $SD=2.61$ ), and the racial composition of the sample was 55% White, 30% Asian/Pacific Islander, 8% Latino, 5% Black, and 2% other ethnicities. As compensation for their participation, participants were entered into a raffle for the chance to win a \$25 gift card to the Cornell Book Store.

## **Procedure and materials.**

**Overview.** Participants were recruited to complete an online survey. The survey consisted of a number of measures included by researchers working on independent projects, but only the measures relevant to the present study are presented below. I was interested in assessing the relationship between busyness and its negative and positive features identified in Study 1. Therefore, participants first reported their subjective perceptions of their own busyness, feelings of time scarcity, and productivity. Since I was also interested in the affective consequences of these features of busyness, participants also reported their life satisfaction. After providing informed consent and completing the survey, participants were debriefed and entered into the raffle.

**Design.** Since I was interested in the relationship between busyness and its features (i.e., feelings of time scarcity and productivity) and the degree to which these features predict an individual's life satisfaction but did not directly manipulate any of these variables, a correlational design was used to assess their relationship. This design also allowed me to determine the amount of variance in participants' life satisfaction that could be explained by participants' feelings of time scarcity and productivity based on regression analyses.

**Busy Self-Concept.** Since busyness is not necessarily the direct result of objective time use, it was necessary to measure participants' subjective perceptions of their own busyness. To do this, participants were asked to indicate the degree to which they agreed with the following statement: "*I am a busy person*" by selecting a number from a 7-point likert scale (1 = strongly disagree; 4 = neither agree nor disagree; 7 = strongly agree).

**Productivity.** The measurement of productivity was also based on participants' subjective perceptions, since it is difficult to find an objective basis by which to judge productivity between different people. Productivity was assessed by having participants respond to the following

question “*When you think about the past few days, how productive do you feel you have been?*” by choosing the number they thought best represented their productivity using a 7-point likert scale (1=not at all productive; 4=somewhat productive; 7=very productive). Since productivity is the result of current or past goal-related behaviors (i.e., you cannot be productive in a situation that has not yet occurred), it was assessed based on participants’ perceptions of their productivity over the past few days.

***Feelings of time scarcity.*** To be consistent with the measurements of time scarcity in Chapter II and to keep the temporal perspective consistent with the measurement of productivity, participants reported on their feelings of time scarcity over the past few days. Specifically, participants responded to the following question “*When you think about all the things you had to do over the past 3 days, do you feel like you had....*” using a 7-point likert scale (1 = not enough time; 4 = enough time; 7 = more than enough time).

***Life Satisfaction.*** Although some view life satisfaction as a consistent, dispositional trait, other have demonstrated that life satisfaction varies depending on current situational circumstances. Thus, life satisfaction was expected to be negatively correlated with feelings of time scarcity and positively correlated with productivity. Life satisfaction was measured using two items from the Satisfaction with Life Scale (Diener et al., 1985). Specifically, participants were asked to indicate the degree to which they agreed with the following statements: “*I am satisfied with my life*” and “*In most ways my life is close to ideal.*” Participants selected the number that best represented their agreement with each statement using a 7-point likert scale (1 = strongly disagree; 4 = neither agree nor disagree; 7 = strongly agree). These items were combined into a single life satisfaction variable, but the assessment of life satisfaction using two (vs. one) items increased the predictive ability and reliability of the measure.

**Data Analytic Strategy.** The present work had two main goals: 1) to assess the degree to which two of the features identified in Study 1 (i.e., feelings of time scarcity and productivity) are associated with busyness and 2) to assess the relationship between life satisfaction and each of these two features. Before performing the analyses, an aggregate life satisfaction variable was computed by combining participants' responses from the two separate life satisfaction questions. Not only has the combination of these two items been previously validated in other work, but the present assessment also revealed that they are strongly correlated ( $r=.71$ ), have a Cronbach's alpha of .82, and that the results are similar when analyzing the two separately.

The relationship between these variables was first assessed by conducting correlational analyses. Specifically, correlations were computed between the following variables: busyness and feelings of time scarcity, busyness and productivity, feelings of time scarcity and life satisfaction, productivity and life satisfaction, and feelings of time scarcity and productivity. The degree to which variations in busyness could be explained by both feelings of time scarcity and productivity was also assessed by conducting regression analyses with time scarcity and productivity as predictors and busyness as the dependent variable. Similarly, two regression analyses were conducted to assess the degree to which feelings of time scarcity and productivity each explained the observed fluctuations in life satisfaction.

## **Results**

***Busyness and its features.*** Since subjective feelings of time scarcity and productivity were identified by participants as negative and positive features of busyness, respectively, I assessed whether correlational analyses would provide additional support for these associations. As predicted, busyness was positively correlated with feelings of time scarcity ( $r=0.28$ ) and positively correlated with productivity ( $r=0.3$ ).

Table 3.1 Correlations between busyness and both feelings of time scarcity and productivity.

Variable	M	SD	r	95% CI
Busyness	5.46	1.25		
Feelings of time scarcity	3.08	1.59	.28**	[.2, .33]
Productivity	4.65	1.27	.3**	[.23, .35]

*Note.* M and SD are used to represent mean and standard deviation, respectively. r = Pearson coefficient, \*\* p<.01.

I sought to provide statistical evidence that time scarcity and productivity are features of busyness by performing regression analyses. Together, these two features explained a significant amount of the variance in busyness,  $F(2,770)=76.28$ ,  $p<.0001$ ,  $r^2=0.16$ . Importantly, the variance in busyness was significantly explained by time scarcity ( $\beta=.27$ ,  $SE=.02$ ,  $t(771)=8.14$ , 95% CI [.15, .25],  $p<.0001$ ) and productivity ( $\beta=.29$ ,  $SE=.03$ ,  $t(771)=8.83$ , 95% CI [.22, .35],  $p<.0001$ ).

***Explaining life satisfaction.*** Feelings of time scarcity and productivity are indeed associated with busyness, but do they also help explain an individual's life satisfaction? The main aim of the present study was to assess how the negative and positive features of busyness predict life satisfaction. As predicted by its identification as a negative feature of busyness, feelings of time scarcity were negatively correlated with life satisfaction ( $r=-.27$ ). Since productivity was identified as a positive feature of busyness, it was expected to be positively correlated with life satisfaction. Indeed, the present findings demonstrated that productivity is positively correlated with life satisfaction ( $r=.37$ ).

Table 3.2 Correlations between life satisfaction and both feelings of time scarcity and productivity.

Variable	M	SD	r	95% CI
Life satisfaction	4.76	1.41		
Feelings of time scarcity	3.08	1.59	-.27****	[-.22, -.34]
Productivity	4.65	1.27	.37****	[.32, .45]

*Note.* M and SD are used to represent mean and standard deviation, respectively. r = Pearson coefficient, \*\*\*\* p<.0001.

A regression analysis was performed to verify that feelings of time scarcity and productivity each explain variations in life satisfaction. By assessing the effects of each in a single model, the results demonstrated that these factors explain a significant amount of the variance in life satisfaction,  $F(2,770)=108.74$ ,  $p<.0001$ ,  $r^2=.22$ . Each factor also independently explained a significant amount of the variance in life satisfaction. Specifically, variance in life satisfaction was significantly explained by time scarcity ( $\beta=-.28$ ,  $SE=.03$ ,  $t(771)=8.84$ , 95% CI [-.32, -.19],  $p<.0001$ ) and productivity ( $\beta=.39$ ,  $SE=.04$ ,  $t(771)=12.14$ , 95% CI [.36, .49],  $p<.0001$ ).

## Discussion

The findings from Study 2 help corroborate the previous finding in which feelings of time scarcity and productivity were identified as negative and positive features of busyness. The correlational relationship and amount of variance in busyness explained both of these features provides additional support for the notion that busyness can be construed in terms of both positive and negative features. Study 2 demonstrated that these busyness-related features have divergent influences on life satisfaction, suggesting that mentally construing busyness in terms of its negative (i.e., time scarcity) or positive features (i.e., productivity) can decrease and increase life satisfaction, respectively. However, this data set has a limitation that prevents the conclusion that a busy situation can indeed be construed in terms of either its positive or negative features.

Specifically, the study design could not ensure that participants were mentally representing one busyness-related situation and construing it in terms of either its negative or positive features (i.e., time scarcity and productivity) or whether participants' reports of time scarcity and productivity were based on two independent situations. For example, it is possible that a participant's feelings of time scarcity were based on one busyness-related situation, while their reported productivity was based on a completely different situation. This potential issue was addressed in Study 3.

### **Study 3**

Study 2 provided further evidence that people can construe busyness in terms of both its negative (e.g., feelings of time scarcity) and positive (e.g., productivity) features. It also provided initial evidence that these features of busyness have divergent effects on life satisfaction. However, these relationships were based on correlational data and therefore only show associative relationships. Additionally, the design of Study 2 could not determine whether participants were construing a single situation in terms of either negative or positive features or instead recalling two completely separate situations when construing busyness in terms of time scarcity or productivity. Therefore, Study 3 was designed to directly test whether construing a busy situation in terms of its positive (i.e., productivity) or negative features (i.e., feelings of time scarcity) directly causes increases or decreases in well-being (i.e., mood and life satisfaction). Specifically, to ensure that Study 3 accurately assessed whether people can *reconstrue* a situation in terms of its positive features (i.e., productivity) when they otherwise would have spontaneously construed it in terms of its negative features (i.e., feelings of time scarcity), participants were instructed to generate two personally-relevant, future situations (within the next 2 months) in which they expected to be busy. Then, after already having generated and described the two events, participants were randomly assigned to construe one of the events in terms of its negative features (i.e., time scarcity) and the

other event in terms of its positive features (i.e., productivity). Since participants generated the situations before being instructed to construe them in terms of either positive or negative features, I could more confidently determine whether a situation can be construed in terms of either type of feature and how these independent construals each affected well-being. Similarly, the mechanism through which this effect might operate was assessed by measuring the manipulation's effect on feelings of time scarcity.

## **Method**

**Participants.** The sample consisted of ninety participants (42 women) recruited from Amazon Mechanical Turk. The sample had a mean age of 28 (SD=1.52). After completing the study, participants received a small monetary payment as compensation for their participation. For the primary test of the construal's effect on well-being, the study reached a statistical power of .81.

**Procedure and Measures. *Overview and Design.*** A within-subjects design was used to ensure that each participant was capable of construing business-related events in terms of both positive and negative features. Moreover, this design allowed me to assess whether construing business in terms of a positive feature (i.e., productivity) would increase mood and life satisfaction relative to construing business in terms of a negative feature (i.e., feelings of time scarcity). Participants were randomly assigned to construe one event in terms of its negative features and one event in terms of its positive features. The order in which the events were and whether they were instructed to construe the first event in terms of negative (vs. positive) features was also randomized. This randomization within the repeated-measures design ensured that each participant construed one event in terms of its negative features (i.e., feelings of time scarcity) and the other event in terms of its positive features (i.e., productivity), confirming that participants could construe the events in terms of either type of feature regardless of how it was spontaneously

construed when it was initially brought to mind and reported. The within-subjects design was also beneficial because it allowed us to conclude that any differences in resulting mood and life satisfaction could be attributed to the particular construal as opposed to differences between the particular participants.

After providing informed consent, participants were asked (1) to generate two future events in which they expected to feel busy and to describe them in 1-2 sentences and (2) to provide a 2 or 3-word cue for each future event that would enable them to recall each when presented with the cue later in the study. Next, one of the two cues was presented in a random order and participants were randomly assigned to focus on either the (a) “negative aspects” (i.e., feeling rushed/perceived time scarcity) or the (b) “positive aspects” (i.e., productivity/efficiency) of the event. Following each recall, participants reported how “good”, “bad”, and “satisfied” they expected to feel during that specific event. Additionally, participants were asked to indicate how busy they expected to feel during each event.

***Generating events.*** Participants were prompted to generate two events in the near future during which they expected to be busy. Specifically, they read the following prompt: “*Our lives may vary from week to week, month to month, with regards to how busy we feel. Sometimes we may feel busier than other times. We'd like you to think about the upcoming months, and to think of an event during which you expect to feel busy. In the space below please describe this upcoming event in 1-2 sentences*” They then provided a 1 or 2-word cue that would be used later in the experiment to remind them of the event they had described. Participants completed this procedure twice, resulting in the description of two upcoming busyness-related events.

***Construal Manipulation.*** After providing cues for each event, we explicitly manipulated whether participants construed each event in terms of its negative features (i.e., feelings of time

scarcity) or its positive features (i.e., productivity). Participants were provided with one cue at a time and read one of the following prompts: 1) *“Often times when people are busy, they feel like they are rushed and like time is “scarce.” That is, they feel that they may not have enough time to do the things they need to do. When thinking about the event displayed above, try to reflect on how during this event you might feel rushed or like time is scarce.”* 2) *“Often times when people are busy, they feel like they become more efficient and productive. When thinking about the event displayed above, try to reflect on how during this event you might feel more efficient and productive.”*

**Well-being.** Overall, I was interested in how construing a busyness-related event in terms of its negative (i.e., feelings of time scarcity) or positive features (i.e., productivity) directly influences well-being. Since well-being has both an affective component (i.e., mood) and cognitive component (i.e., life satisfaction), both were measured in our assessment of well-being.

**Mood.** To investigate how each type of construal influenced in-the-moment affective feelings, mood was assessed by asking participants to report the feelings of positive and negative affect they expected to feel during the busy events they listed and then construed based on our instructions. Specifically, participants were asked to respond to the following questions: *“How good do you expect to feel during the event listed above?”* and *“How bad do you expect to feel during the event listed above?”* using a 7-point likert scale (1 = not at all; 5 = somewhat; 9 = very).

**Life Satisfaction.** In addition to assessing how construing a busy event in terms of its positive (vs. negative) features influences affective feelings, I was also interested in how these construals influenced an individual’s assessment of and satisfaction with their life. Life satisfaction was assessed using one item from the satisfaction with life scale (Diener et al., 1985). Specifically, participants were asked to respond to the following question based on how they will feel during

each of the events they described earlier: “*To what degree do you agree with the following statement: ‘I am satisfied with my life?’*” using a 7-point likert scale (1 = strongly disagree; 5 = neither agree nor disagree; 9 = strongly agree).<sup>5</sup>

**Effects on time scarcity.** I was also interested in whether these construals would affect people’s subjective feelings of time scarcity related to the upcoming events. Given the relationship between subjective feelings of time scarcity and well-being, assessing how these construals affect feelings of time scarcity could potentially inform our understanding of the processes through which these construals affect well-being. Therefore, subjective feelings of busyness were assessed by asking participants to respond to the following question “*Now when you think about this event, to what degree do you feel like time will be scarce (i.e., feeling like you will not have enough time to do what you plan to do)?*” using a 9-point likert scale (1 = not at all; 5 = somewhat; 9 = very much so).

**Data Analytic Strategy.** To assess whether construing a busy event in terms of its positive features (i.e., productivity) instead of its negative features (i.e., time scarcity) leads people to anticipate increased life satisfaction, I used a paired samples t-test with condition as the independent variable and life satisfaction as the dependent variable. I also wanted to assess how these construals influenced how good or bad people anticipated feeling. Since the data for positive and negative affect were correlated ( $r=.76$ ), had a Cronbach’s alpha of .88, and the pattern of results is similar when assessing positive affect and negative affect separately, an aggregate was created by combining positive affect and reverse-coded negative affect and into one mood variable. A

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<sup>5</sup> Past research has provided evidence that single-time assessments (and shorter scales more generally) can often be sufficient and as statistically predictive as full measures (Bergkvist & Rossiter, 2007; Cunny & Perri, 1991; Drolet & Morrison, 2001; McKenzie & Marks, 1999; ). We felt confident assessing life satisfaction with a single-item, since past research has explicitly demonstrated that single-item assessments of satisfaction are as statistically predictive as multiple-item measures (Hyland & Sodergren, 1996; Ittner & Larcker, 1998; Scarpello & Cambell, 1983).

paired t-test with condition as the independent variable and mood as the dependent variable was then conducted. In addition to assessing how these construals affected people's anticipated mood and life satisfaction, I was also interested in whether the construals influenced how busy people expected to feel during the upcoming event, since this would provide evidence regarding the process through which the affective benefits occur. Specifically, a paired t-test was conducted with condition as the independent variable and subjective feelings of time scarcity as the dependent variable.

## Results

**Mood.** I first assessed how construing busyness in terms of positive vs. negative features affected mood ( $M=7.26$ ;  $SD=1.69$ ), which revealed that these construals did indeed have a significant influence. Specifically, construing busyness in terms of its positive features (i.e., productivity) ( $M=7.33$ ,  $SD=1.73$ ) led people to anticipate an increased positive mood relative to construing an event in terms of its negative features (i.e., feelings of time scarcity) ( $M=6.92$ ,  $SD=1.88$ ),  $t(88) = 3.54$ , 95% CI [.25, .89],  $p<.001$ ,  $d=.23$ .

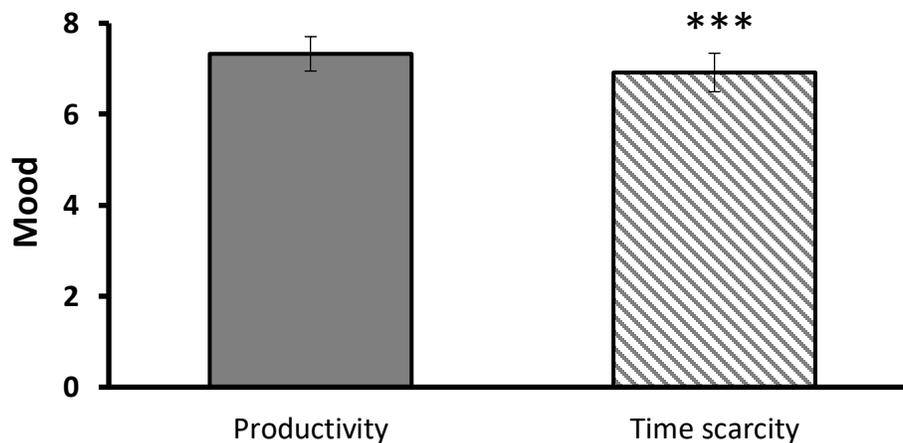


Figure 3.3 The effects of productivity and time scarcity on mood. Data are represented as mean  $\pm$  95% CI, \*\*\* indicates  $p<.001$ .

**Life satisfaction.** Construing an upcoming busy event in terms of its positive (vs. negative) features increased positive mood, but how does this construal affect life satisfaction? The present study demonstrated that these construals do significantly affect life satisfaction ( $M=6.95$ ,  $SD=1.69$ ). When participants construed busyness in terms of its positive (vs. negative) features, they expected to feel significantly more satisfied with their lives,  $t(89)=2.41$ , 95% CI [.06, .60],  $p=.02$ ,  $d=.21$ .

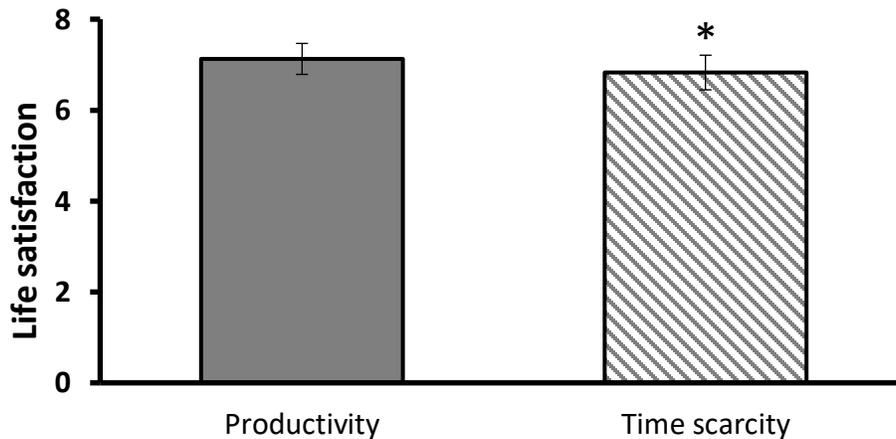


Figure 3.4 The effects of productivity and time scarcity on life satisfaction. Data are represented as mean  $\pm$  95% CI, \* indicates  $p<.05$ .

**Subjective feelings of time scarcity.** It is possible that the effect of our manipulation could have been caused by a decrease in feelings of time scarcity. The results revealed that construing busyness in terms of its positive features (i.e., productivity) did not significantly decrease feelings of time scarcity ( $M=5.91$ ,  $SD=1.99$ ) compared to construing busyness in terms of its negative features (i.e., feelings of time scarcity) ( $M=6.02$ ,  $SD=2.12$ ),  $t(88)=.52$ , 95% CI [-.35, .60],  $p=.61$ .

## Discussion

Study 3 addressed the main limitation in Study 2 by randomizing which events participants construed in terms of their positive or negative features. By doing so, Study 3 provided causal evidence that construing a busyness-related event in terms of its positive (vs. negatively) features

has beneficial effects for an individual's well-being by increasing mood and life satisfaction. Interestingly, the construal manipulation did not have a significant effect on people's subjective feelings of time scarcity. This could suggest that the affective benefits of construing busyness in terms of its positive features (i.e., productivity) might be caused directly from the increased focus on the positive features of busyness, without influencing subjective feelings of time scarcity. Since the framing of each event was randomly assigned, the findings provided causal evidence of the positive effects associated with framing a busy event in terms of its positive features (i.e., productivity) as opposed to negative features (i.e., feelings of time scarcity).

### **General Discussion**

The experience of busyness, as well as its antecedents and consequences, has only recently begun to receive direct attention from psychologists. Moreover, this extant research has mainly focused on the negative implications busyness can have for mental and physical health (Garling et al., 2014; Kaluza, 2007; Schlotz et al., 2004; Schneider et al., 2004; Shanafel et al., 2012; Zuzanek, 2004). However, some recent work from the person perception literature has provided initial evidence that busyness can sometimes be beneficial. Specifically, Bellezza and colleagues (2018) demonstrated that busy people are often perceived as being high status and important. If being perceived as busy can confer social benefits, then can personally feeling or being busy have benefits for the self as well? Findings from research investigating related constructs including flow states, idleness aversion, and the processes involved in goal pursuit have indirectly suggested that it can. Furthermore, recent work has demonstrated that time scarcity (i.e., a feature of busyness identified by participants in Chapter II) can increase people's work-related productivity and efficiency (Mullainathan & Shafir, 2013; Shah, Mullainathan, & Shafir, 2012). Building on these findings, the present work investigated whether people could generate positive features of

busyness if prompted to do so. Interestingly, even though the results from Chapter II demonstrated that people spontaneously construe busyness in terms of its negative features, the results presented here demonstrate that people can identify and describe positive features of busyness if they are explicitly instructed to. Specifically, people reported the following positive features of busyness: *productivity* (i.e., working on and completing tasks), *activeness* (i.e., engaging in activities as opposed to allowing time to pass idly), *intrinsic motivation* (i.e., engaging in activities that an individual wants to do vs. activities that they have to do), and *goal pursuit* (i.e., busyness resulting from goal pursuit or goal attainment). Since it seems people can construe busyness in terms of its positive features, the next aim was to assess whether this positive construal can have beneficial effects for well-being. As predicted, construing an upcoming busyness-related event in terms of its positive features (i.e., productivity) as opposed to its negative features (i.e., feelings of time scarcity) led people to anticipate experiencing increased positive mood as well as increased life satisfaction during the upcoming event. Surprisingly, construing a future busyness-related event in terms of the resulting productivity (vs. feelings of time scarcity) did not influence whether people anticipated experiencing feelings of time scarcity. This suggested that the affective benefits of construing busyness in terms of its positive features might be due to an increased focus on the positive features themselves, as opposed to an indirect effect in which the positive construal provided affective benefits by decreasing feelings of time scarcity. Importantly, this work provides causal evidence for a strategy that attenuates the negative affective consequences of being busy and also provides initial insights into the potential mechanism through which this effect might occur.

## **Implications for busyness and the regulation of its negative affective consequences**

Research on busyness and its downstream effects has increased in recent years. Previous work has operationalized busyness both in terms of objective time use (i.e., number of hours worked) and subjective experiences of time (i.e., subjective feelings of time scarcity), demonstrating that both have detrimental effects for well-being. The findings from Chapter II built on this work by identifying more specific features of busyness and demonstrating their independent effects on well-being. The present findings increase our understanding of busyness as a construct even further by not only demonstrating that people can construe busyness in terms of positive features, but also identifying these specific positive features (i.e., *productivity, activeness, intrinsic motivation, and goal pursuit*). The identification of these positive features of busyness adds to our theoretical understanding of busyness and also corroborates past work suggesting that busyness can sometimes be beneficial (Bellezza, Paharia, & Keinan, 2017; Keinan, Bellezza, & Paharia, 2019; Mochon, Norton, & Ariely, 2012; Perlow, 1999; Schor, 1992).

The present findings demonstrate that busyness can be construed in terms of its positive features, and that doing so can provide affective benefits. Past work investigating the regulation of the negative affect associated with busyness has focused on techniques that modify the situation itself or require individuals to engage in additional behaviors to recover from the negative affective consequences of busyness after the situation has ended (Garling et al., 2014; Kaplan, 1995; Kaplan et al., 2013). The present work demonstrated that the negative affective consequences of busyness can be regulated by changing the cognitive representation of the busyness-related event, which does not require changes to the objective situation or the engagement of additional behaviors to recover from the negative affective experience. Specifically, the present work demonstrated that construing busyness in terms of its positive (i.e., productivity) vs. negative (i.e., feelings of time

scarcity) features increases both mood and life satisfaction. However, the mechanism through which these affective benefits occur still needs to be explicitly determined. suggest potential mechanisms for the present effect.

In the present work, construing busyness in terms of its positive (vs. negative) features provided affective benefits, but the mechanism driving these benefits was not clear. Theoretically, this effect could potentially have occurred due to the decreased focus on time itself. Work on subjective time perception demonstrates that focusing on time (vs. another other aspect of the situation, such as the resulting productivity) makes a segment of time subjectively feel longer (Block 1990; Zakay, 1992). Since feelings of time scarcity are based on subjective perceptions of how long a task is expected to last and an awareness of the amount of time available to complete a task, construing busyness in terms of productivity (vs. feelings of time scarcity) could have provided affective benefits by decreasing feelings of time scarcity. However, the present findings demonstrated that the construal manipulation did not significantly affect feelings of time scarcity. One potential explanation for this surprising finding is that participants could have experienced decreased feelings of time scarcity following the manipulation, but this change could have been eliminated at the time they reported on these feelings. Specifically, potential differences between conditions in terms of time scarcity could have been reduced directly before reporting them based on how they were measured, that is, participants first generated the events and memory cues based on an upcoming situation in which they expected to feel busy and time scarce. Therefore, when participants were again presented with the memory cue and asked to report their feelings of time scarcity, the cue could have increased the salience of the time scarcity-related features of the situation, thereby eliminating the effect the positive construal might have had on participants' feelings of time scarcity.

Alternatively, it is also possible that the affective benefits were due to the increased focus on the positive features of busyness. Goals are associated with positivity (Custer & Aarts, 2005) and this positivity can spontaneously transfer between a goal-relevant outcome and the associated goal-related means (Brendl et al., 2003; Shah & Kruglanski, 2003; Fishbach, Shah, & Kruglanski, 2004). Therefore, if busyness is construed in terms of its resulting productivity (i.e., positive outcome), then busyness itself and the associated time pressure (i.e., the goal-related feelings and behaviors that lead to the productivity) can become imbued with positivity. Thus, construing busyness in terms of its productivity could provide affective benefits since the stimulus being construed would now be associated with positive affect.

### **Implications for productivity**

The present work demonstrates that construing busyness in terms of productivity (vs. time scarcity) can provide affective benefits. However, the feelings of time scarcity associated with busyness can be beneficial by helping an individual prioritize important tasks, thereby increasing efficiency and productivity (Shah, Mullainathan & Shafir, 2012). Specifically, these feelings of time scarcity increase an individual's focus on behaviors that are instrumental for attaining a desired goal, while also decreasing the likelihood that the individual will get distracted by goal-irrelevant behaviors that would be detrimental for goal attainment. This attentional shift increases an individual's efficiency, thereby increasing productivity (Shah, Mullainathan & Shafir, 2012). Given this, it could be possible that decreasing an individual's focus on feelings of time scarcity by having them instead construe busyness in terms of productivity could also coincidentally decrease the resulting productivity. If construing busyness in terms of its positive features has a beneficial effect (i.e., attenuating the negative affective consequences of busyness) but also a coincidental negative effect (i.e., decreased productivity), then it could be important to

strategically deploy this regulation technique in order to produce the effect that is most beneficial at a given time. In fact, past research has suggested that a medium level of time pressure might have the most beneficial effects in terms of performance and productivity (Andrews & Farris, 1972; Freedman & Edwards, 1988). This notion is supported by past work demonstrating that children who are most successful at attaining their goals are able to shift their attention between the desired outcome and the concrete steps necessary to achieve that outcome. Specifically, focusing briefly on the desired outcome increases their task-related motivation and then quickly shifting back to the concrete steps of the task allow them to most successfully attain the desired outcome (Peake, Hebl, & Mischel, 2002). Thus, future research ought to investigate whether actively and intentionally rotating between construing a busy situation in terms of its negative features (i.e., feelings of time scarcity) and its positive features (i.e., the resulting productivity) can produce an ideal balance in which the feelings of time scarcity motivate goal-relevant behaviors without becoming overly stressful and debilitating.

### **Concluding Statement**

To the best of my knowledge, the present research is the first to demonstrate that people are capable of identifying positive features of busyness when instructed to do so and that construing busyness in terms of these positive features (i.e., productivity) as opposed to its negative features (i.e., feelings of time scarcity) can have a beneficial effect on well-being. Given the need to be as productive and efficient as possible, the results presented here suggest that this regulation technique could potentially be used strategically in order to achieve an overall balance that optimizes the functional benefits of being busy. Since busyness is considered a ubiquitous aspect of life in western cultures, manipulating its construal in order to increase well-being could have beneficial effects for a large number of people.



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**CHAPTER IV. Preemptive Social Regulation: Mental representations of attachment figures buffer against internally generated negative affect via increased positivity**

**Abstract**

A key purported function of attachment figures is the regulation of affective responses. Past work has primarily focused on how attachment figures help to restore *physiological* equilibrium following an *externally-generated stressor* (e.g., pain). But how might the imagined presence of an attachment figure shape *subjective affective responses* to *self-generated upsetting autobiographical memories*? Scant attention has been given to the regulation of subjective affective responses to internally-generated distressing events. Moreover, work has primarily focused on safe haven functions wherein attachment figures restore affective equilibrium *after* experiencing a stressor. Less work has focused on secure base functions wherein attachment figures *preemptively* regulate responses to stressors. Across Studies 1a-2, simply viewing a photograph of an attachment figure (i.e., mother; relationship partner) preemptively buffered against the negative affect induced by an upsetting memory recall. Study 3 confirmed that the effect was driven by the affective benefits resulting from viewing the attachment figure primes (vs. a detrimental effect resulting from viewing the control prime), while Studies 4-5 explored other environmental stimuli that might elicit effects similar to the attachment figures (i.e., a photograph of a self-chosen celebrity and positive object). By examining boundary conditions that directly manipulate positivity, the findings demonstrate that mental representations of attachment figures preemptively regulate affective responses via their ability to spontaneously elicit positivity. Overall, the present work establishes that simple reminders of attachment figures lessen the affective sting of upsetting memory recalls. Moreover, consistent with work showing that complex psychological phenomena (e.g., prejudice; morality) are shaped by basic affective processes, the

present work too demonstrates that attachment figure mental representations' ability to preemptively buffer, a form of social affect regulation, occurs via positivity.

### **Preemptive Social Regulation: Mental representations of attachment figures buffer against internally generated negative affect via increased positivity**

In an age-old tradition, soldiers often bring photographs of loved ones with them when they are deployed. An unstated belief is that the presence of a loved one, even if only imagined, may ease the emotional toil of war. But do such simple reminders provide a psychological buffer, and if so, how do these benefits occur? The present work, informed by an attachment framework, aimed to demonstrate that merely activating the mental representation of an attachment figure, for example, by viewing a photograph of the person, *preemptively* lessens the affective sting triggered by recalling a personally distressing autobiographical memory. The present work further sought to identify the mechanism by which such preemptive buffering effects occur.

### **Emotions and their Regulation: From solo to social regulation techniques**

Emotions function to guide a wide array of adaptive behaviors (Barrett & Bar, 2009; Barrett & Campos, 1987; Beckes & Coan, 2011; Clore & Tamir, 2002; Coan, 2008; Ekman, 1992; Izard, 1971; Lazarus, 1991; Oatley & Johnson-Laird, 1987; Schwarz & Clore, 1983; Stefanucci, Gagnon, & Lessard, 2011). But they can sometimes be disruptive; if routinely experienced or left unregulated, negative emotions can be detrimental to physical and mental well-being. Traditional approaches to emotion regulation have focused on identifying strategies that enable individuals to down-regulate negative emotions. For example, prompting people to reappraise the meaning of negative stimuli in a more positive or neutral fashion reliably lessens negative affect triggered by the stimuli (Gross, 1998; Gross, 2001; Gross & John, 2003; John & Gross, 2004; Wrosch et al., 2000). Likewise, viewing negative stimuli through an observer-oriented perspective (Ayduk & Kross, 2008) or a future-oriented perspective (Ranney, Bruehlman-Senecal & Ayduk, 2017) serves to dampen negative affect.

These approaches have generally focused on emotion regulation as a solo endeavor in which an individual in isolation deliberately attempts to change how the emotion-eliciting event is viewed. The use of self-initiated strategies to regulate one's emotions is undoubtedly important. Yet, humans are inherently social beings; emotions emerge, develop, and function within a social context (Cassidy; 1994; Cole, Martin & Dennis, 2004; Eisenberg et al., 2011; Eisenberg, Spinrad, & Eggum, 2010; Thompson; 1994).

Arguably the most dominant theoretical perspective on how social ties serve regulatory functions is offered by attachment theory. According to this theory, a normative function of attachment figures is the regulation of physiological and affective states (Bowlby, 1982; Gump et al., 2001; Holt-Lundstad et al., 2003; Mikulincer & Shaver, 2007; Quigley, Lindquist, & Barrett, 2014; Sbarra & Hazan, 2008; Selcuk, Zayas, & Hazan, 2010; Simpson, Rholes, & Nelligan, 1992). When individuals feels distress—as a result of an external or internal threat—they seek the presence of an attachment figure. The resulting contact from an available and responsive attachment figure alleviates distress. This is often referred to as the attachment figure's *safe haven* function. But attachment figures also confer affective benefits in the absence of a stressor. The mere presence of an attachment figure is expected to provide feelings of security which in turn enables an individual to confidently explore their environment. This is often referred to as the attachment figure's *secure base* function.

A long line of research from the child (e.g., Ainsworth, Blehar, Waters, & Wall, 1978; Larson, Gunnar, & Hertzgaard, 1991) and adult attachment literatures demonstrate the power of attachment figures to regulate physiological and affective systems (see Sbarra & Hazan, 2008; Selcuk, Zayas, & Hazan, 2010, for reviews). For example, the physical presence of a partner dampens the neural threat response when anticipating the receipt of a mild electric shock (Coan et

al., 2006) and decreases subjective reports of pain in response to cold temperatures (Brown et al., 2003; Jackson et al. 2005). The physical presence of a partner also dampens the stress response elicited by social evaluation. For example, participants who spent 10 minutes of physical interaction with their partner (i.e., handholding and hugging) demonstrated decreased systolic and diastolic blood pressure, decreased heart rate (Grewen et al., 2003), lower cortisol levels (Ditzen et al., 2007), and reduced stress and anxiety to giving an unprepared speech (Ditzen et al., 2007; Ditzen et al., 2008).

### **Social Regulation via Both the Physical Presence and Imagined Presence of Attachment Figures**

These regulatory benefits result not only from actual interactions with an attachment figure, but also from their imagined presence (Hofer, 1984; Mikulincer & Shaver, 2007). As dyadic interactions are repeated they become stored in memory as mental representations (i.e., internal working models) (e.g., Bowlby, 1973, 1982; Bretherton & Munholland, 2008; Collins, Guichard, Ford, & Feeney, 2004; Pietromonaco & Feldman Barrett, 2000). In particular, repeated positive interactions with attachment figures during times of stress reinforce the association in long-term memory between bids for support and stress reduction (e.g., Beckes, Simpson, & Erickson, 2010; Mikulincer & Shaver, 2007; Zayas et al., 2017). Eventually, even the imagined presence of attachment figures can provide affective regulatory benefits by activating physiological and psychological states similar to those that were elicited during the original interactions (Depue & Morrone-Strupinski, 2005; Hofer, 1984; Mikulincer & Shaver, 2007; Uvnas-Moberg, 1998). Research has provided support for the idea that the symbolic representation can confer affective benefits. For example, simply viewing a photograph of one's attachment figure decreased the subjective experience of pain (Masters et al., 2008; Younger et al., 2010) and reduced pain-related

neural activity (dorsal anterior cingulate cortex; anterior insula). Research has also shown that symbolic representations can function like a prepared safety signal, reducing the acquisition of a fear response via the ventromedial prefrontal cortex (VMPFC) (Eisenberger et al., 2011).

### **From Promoting Recovery from External Stressors to Preemptively Buffering against Internal Stressors**

Much of the current research has focused on the question—how do attachment figures help individuals *recover* from *external* threats (e.g., Beckes, Simpson, & Erickson, 2010; Mikulincer & Shaver, 2007)? This focus may reflect the salience of the safe haven function of attachment figures in attachment theory. Indeed, the attachment system is assumed to be idle in the absence of a threat. It is only when a threat is perceived that the attachment system becomes “activated,” leading to a cascade of subsequent behaviors that involve seeking proximity and contact with the attachment figures. The resulting contact should restore equanimity and deactivate the attachment system (Mikulincer & Shaver, 2007). In this view, the safe haven function is the prototypical manifestation of the attachment system. Much of the literature has in fact focused on the regulatory effects provided by an attachment figure after a threat has been encountered (Beckes, Simpson, & Erickson, 2010; 2007; Mikulincer, Florian, & Hirschberger, 2003; Mikulincer & Shaver, 2007; Zayas et al. 2009). I refer to this as the recovery effect. That is, activating the mental representation following a stressful event or upsetting memory recall is expected to provide regulatory benefits and help to alleviate negative affect.

Interestingly, less attention has been given to potential regulatory benefits obtained prior to a stressor. Theoretically, attachment figures should promote affect regulation not only when exposure (actual or imagined) occurs *after* the stressor, but also when exposure occurs *before* the stressor. According to attachment theory, regulation that occurs before the stressor is related to the

secure base function of attachment figures in which individuals feel safe to explore their environment since they know they are protected if they encounter a threat in the future (Bowlby, 1982; Gump et al., 2001; Mikulincer & Shaver, 2007; Sbarra & Hazan, 2008; Simpson, Rholes, & Nelligan, 1992). Given that exposure to an attachment figure should automatically activate feelings of safety and positivity (e.g., Mikulincer & Shaver, 2007; Zayas & Shoda, 2005), benefits should also arise when exposure to an attachment figure occurs *prior* to the negative affect exposure (i.e., negative autobiographical memory recall). That is, the feelings of positivity and security triggered by the mental representation of an attachment figure prior to a stressful event or upsetting memory recall ought to decrease the extent to which the event feels stressful or upsetting, thereby decreasing negative affect. This preemptive effect is referred to this as the *buffering effect* (Selcuk et al., 2012). Although attachment theory predicts this secure base function of attachment figures there has been less attention given to the ways in which attachment figures can preemptively buffer individuals.

In addition to focusing on safe haven functions (vs. secure base functions), most previous work has focused on the regulation of physiological responses to external threats (i.e., pain or stress). External threats can be detrimental, but internally-generated threats can have negative affective consequences as well. Indeed, some of the most pernicious threats are the result of a person's own thoughts and memories (e.g., Brewin, 2007; Brosschot, Gerin, & Thayer, 2006; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). These internally-generated threats are associated with physical and psychological disorders and are the target of many therapeutic techniques (e.g., Ayduk & Kross, 2008; Brewin, 2007; Brosschot, Gerin, & Thayer, 2006; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Memories of upsetting events spontaneously come to mind in daily life (e.g., Ayduk & Kross, 2010) and are associated with increased negative affect

and negative cognitions (Ayduk & Kross, 2008), all of which increase a person's vulnerability to rumination—a state characterized by a spontaneously repetitive and passive focus on the events that cause negative affect (Nolen-Hoeksema et al., 2008).

Not only are self-generated threats potentially more pernicious, but the strategies that typically serve to regulate external threats may not as successfully regulate internal ones. Findings from the emotion regulation literature demonstrate that emotion induced by an internal (vs. external) event is supported by partially distinct neural systems (Ochsner et al., 2009), and consequently the effectiveness of particular affect regulation strategies can differ between internal and external threats. For example, cognitive reappraisal—a technique in which individuals construe a situation in non-emotional terms—is more effective at decreasing negative affect when the negative affect is elicited from an internal source (vs. the external environment). Although this affect regulation strategy is an example of a cognitive (vs. social) regulation strategy, it highlights how the effectiveness of various strategies depends on whether the negative affect is elicited by an internal vs. external threat.

To my knowledge, there is no empirical evidence that reminders of attachment figures can serve to preemptively regulate subjective affective responses to internally-generated distressing memories. One paper was found (Selcuk et al., 2012) that examined the ability of attachment figures to regulate subjective affective responses triggered by one's own distressing thoughts, and the efficacy of the regulatory benefits as a function of the timing of the activation of the mental representation. Specifically, participants were asked to recall a distressing autobiographical memory, which reliably increased negative affect, and viewed a photograph of an attachment figure before or after the upsetting memory recall. Importantly, viewing the photograph of their attachment figure *after* recalling this upsetting memory helped to alleviate negative affective

reactions and restore participants to their baseline level of affect, but viewing a photograph of their attachment figure *before* the upsetting memory recall did not. Thus, there was clear and robust evidence for the recovery effect, but no evidence for the buffering effect.

Why might have previous work (Selcuk et al., 2012) failed to have shown evidence for buffering? One reason may be due to the memory recall instructions that were used. In their studies, participants were instructed to “*let your deepest thoughts and emotions about this experience run through your mind.*” These instructions are similar to those used in the emotion regulation work to instruct participants to take an immersed perspective and have been found to enhance negative affect to an upsetting memory recall as well as to increase rumination and blood pressure reactivity (Ayduk & Kross, 2008; Kross et al., 2005). In the present work, I simply aimed to prompt participants to recall an upsetting memory without instructing them how they should recall the memory. I predicted that, in the absence of explicit instructions to take an immersed mindset, activating the representation of an attachment figure prior to an upsetting memory recall would lead to preemptive buffering.

### **Exposure to Attachment Figures Elicits both Attachment-related Feelings and Positivity**

The affective regulatory abilities of attachment figures, whether focused on the effect of the physical presence (vs. imagined presence) of attachment figures, their ability to regulate pain or stress (vs. subjective affective experiences), or whether the negative stimulus is externally (vs. internally) generated, ostensibly operate through a common mechanism. Specifically, these regulatory benefits have been demonstrated to operate via the attachment-related feelings (i.e., comfort, support) that are spontaneously elicited by an attachment figure or its mental representation (Depue & Morrone-Strupinski, 2005; Mikulincer & Shaver, 2007; Selcuk et al., 2012). This view has been supported by fMRI research demonstrating that viewing the photograph

of an attachment figure activates brain areas that are a part of the opioid system, which are implicated in pain reduction and are associated with the subjective experience of comfort and safety (Eippert et al., 2008; Eisenberger et al., 2011; Kim & Richardson, 2009).

However, viewing a photograph of an attachment figure activates other neural areas as well (Aron et al., 2005; Bartels & Zeki, 2004; Eippert et al., 2008). One such area is part of the dopaminergic system, which is implicated in the processing of rewards (social and nonsocial) and is associated with the subjective experience of pleasure or positivity (Aron et al., 2005; Bartels & Zeki, 2004). Corroborating these fMRI findings, Zayas and Shoda (2005) demonstrated that exposure to an attachment figure, whether real or imagined, activates feelings of positivity. Moreover, the positivity elicited by recalling a positive memory has been demonstrated to reduce internally generated negative affect (Speer & Delgado, 2017). In line with previous work demonstrating that complex social phenomena such as morality and prejudice operate via simple mechanisms, such as positivity (Karpinski & Hilton, 2001; Kawakami et al., 2000; Valdesolo & DeSteno, 2006; Wittenbrink et al, 2001), it is possible that the preemptive buffering effect investigated here could operate via positivity as well.

### **Present Research**

The main aims of the present work were to examine 1) if the imagined presence of an attachment figure (i.e., mother and relationship partner) *preemptively* buffers against the negative affect elicited by an upsetting memory recall and 2) through what process this buffering effect operates. Importantly, various control comparisons (i.e., a photograph of a yoked stranger, a neutral object, self-chosen celebrity, and positive object – some of which are uncommon in this type of work) were used to explore boundary conditions and to directly assess the mechanism underlying the buffering effect. Specifically, Studies 1a and 1b provided initial empirical evidence

(and a direct replication) that the activation of the mental representation of an individual's mother can preemptively buffer against internally generated negative affect. Study 2 extends this finding by establishing that romantic partners (in addition to mothers) also provide a significant preemptive buffering effect. The control prime used in Studies 1a-2 was a yoked stranger, which has been shown to sometimes elicit negative affective responses (e.g., anxiety). Since it is possible that the stranger control prime could actually have increased negative affect, Study 3 used a photograph of a negative object as the control prime to ensure that the effect is indeed driven by the downregulation of negative affect following the attachment figure prime (vs. increased negative affect following the control prime).

Studies 1a-3 demonstrated the preemptive buffering effect with two different types of attachment figures (i.e., mother; romantic partner) and two different types of neutral controls (i.e., yoked stranger; neutral object). Neutral control conditions are common in past research investigating the regulatory effects of attachment figures, but it is less common to use positive affect controls. Therefore, Studies 4 and 5 were designed to establish the boundary conditions of the buffering effect and to more closely assess the mechanism through which this buffering effect operates. Specifically, Study 4 used a social positive control (i.e., self-chosen celebrity) that elicits both attachment-related feelings and general feelings of positivity (Boon & Lomore, 2001; Greene & Adams-Price, 1990; Hoffman & Tan, 2015; Horton & Wohl, 1956; Lang et al., 2008; Quigley, Lindquist, & Barrett, 2014). Study 5 utilized a positive image (e.g., fireworks, castle) as a positive control as this stimulus elicits positivity but not attachment-related feelings, thereby allowing me to assess whether positivity alone is sufficient to produce a preemptive buffering effect.

## Study 1

In Studies 1a and 1b, I primarily aimed to provide initial evidence that a simple reminder of an attachment figure can serve to preemptively buffer against the negative affect triggered by an upsetting autobiographical memory recall. Given that mothers serve as attachment figures throughout a person's life (Ainsworth, 1989; Bowlby, 1951; Bretherton, 1992; Cicirelli, 1989; Cicirelli, 1991; George, Kaplan, & Main, 1996), I first examined the effect of viewing a photograph of one's mother (vs. a yoked participant's mother) in Study 1a. Additionally, I performed an initial examination of the potential mechanism, that is, whether the preemptive buffering effect is driven by prime-elicited positive affect. Then, in order to increase rigor and reproducibility, I conducted a direct replication in Study 1b.

### Study 1a

Study 1a examined the ability of the imagined presence of one's mother (vs. a yoked participant's mother) to buffer against negative affect. Additionally, it assessed whether the preemptive buffering effect was driven by prime-elicited positive affect.

### Method

**Participants.** One hundred and three undergraduate students (63 women) from Cornell University participated in the study for course credit. The mean age of the sample was 20 ( $SD=2.47$ ). Moreover, the racial composition of the sample was 62% White, 35% Asian/Pacific Islander, 9% Latino, 8% Black, and 3% other ethnicities. Given this sample size and the within-person research design, the present study reached a statistical power of .99 to detect a medium effect (Cohen's  $d=.50$ ) using a repeated measures ANOVA.

**Procedure and materials. Overview.** Participants completed two in-lab sessions: an initial pre-test session and an experimental session that was held 3-7 days later. In the pre-test session,

participants were instructed to submit a passport-like photograph of their attachment figure, completed pre-test measures assessing the relationship with their attachment figure and other individual differences related affect regulation, and the autobiographical memory generation task. In the experimental session, participants completed the Attachment Affect Regulation Task (AART; Selcuk et al.,2012; Figure 4.1), a computer-based task developed to assess the extent to which activation of attachment figure representations can downregulate affective responses to an upsetting memory recall. Upon completion of the experiment, participants were probed for suspicion and fully debriefed about the purpose of the study.

***Design.*** The main factor of interest was the prime presented during the AART. Specifically, primes consisted of either a photograph of the participant's mother or a yoked participant's mother. To implement the yoked design, couples of same-sex participants were paired, resulting in yoked pairs of participants (i.e., participant 4 was presented with participant 7's mother as the control, while participant 7 was presented with participant 4's mother as the control). This yoked design eliminated the possibility that differences between conditions in the strength of the buffering effect could be driven by differences between the photograph primes other than the fact that one is an attachment figure and the other is not.

***Attachment figure stimuli submission.*** To obtain stimuli for the prime manipulation, participants submitted a digital photograph in which their attachment figure is directly facing the camera and not wearing any items that obscure the face (e.g., sunglasses). A research assistant confirmed that the photograph adhered to the instructions and standardized it by replacing the background with a gray fill, cropping the photo so that it only includes the attachment figures head and shoulders, and resizing the photo to 5 x 5 in (12.7 x 12.7 cm).

**Generating upsetting autobiographical memories.** To ensure that participants would be able to recall an upsetting memory during the experiment, participants were asked to write in detail about two upsetting autobiographical memories prior to the experimental session using procedures adapted from Kross et al. (2009). They were told that the memories could refer to any type of negative experience as long as they did not involve participants' attachment figure (Studies 1a & 1b: mother; Studies 2-5; partner). Participants first described the memory in detail. Then, they provided a "memory cue" (i.e., 1-3 word description) that would be used to help them recall the memory during the experimental session. After describing the memory and providing a cue, participants rated the past and present significance of the event using the following eight-item scale validated in Selcuk et al. (2012): "*When this even happened, how significant was the event in your life?*"; "*How significant is the event in your life currently?*"; "*When you recall this experience now, how bad do you feel?*"; "*When you think about this experience, how vividly does it come to mind?*"; "*How frequently have you thought about this experience since it happened?*"; "*How frequently do you think about this experience currently?*"; and "*How frequently did you think about this event soon after it occurred?*" Participants answered these questions using a 7-point scale (1 = *not very*, 4 = *somewhat*; 7 = *very*). If participants reported lower than 4 in response to "*When you recall this experience now, how bad do you feel?*" they were asked to generate a more upsetting memory that would be used during the experimental session.

**Prime manipulation.** Two participants were paired together upon registering for the study, creating a yoked pair in which they saw each other's mother/partner as the control condition. Since each yoked pair saw the same two faces, peculiarities of the stimuli were controlled entirely. In order to activate the mental representation of the attachment figure, a photograph of the participant's mother/partner or yoked/celebrity/etc. was presented at the center of the screen. To

ensure that participants attended to the photograph, thirty yellow equilateral triangles (0.3 inches) were individually presented for 300ms each at one of six possible locations (i.e., upper left, mid-left, lower left, upper right, mid-right, lower right side of the photograph). Participants indicated the position of the triangle by pressing the “d” (for left) or “k” (for right) buttons on the keyboard. Thirty triangle stimuli were presented (five flashes at each location) ensuring a 90-second prime exposure.

***Upsetting Memory Recall Task.*** For the memory recall, participants were presented with the “memory cue” that they provided in the pre-experimental session. Under the cue, they were asked to recall the event and write about it for 60 seconds. Before this occurred in the experimental trials, they were first presented with the cues and asked to report whether they remembered the associated event by clicking “yes” or “no” at the bottom of the screen.

***Attachment Affect Regulation Task (AART).*** Each trial of the AART consisted of a prime manipulation followed by an upsetting memory recall. Studies 1a & 1b included two trials (one for each prime) while Studies 2-5 included four trials (two for each prime). These trials were counterbalanced so that half of the participants were presented with the attachment figure prime first while the other half were presented with the control prime first. The order of the primes did not significantly affect the results,  $p=.38$ . Participants negative affect was assessed at the beginning of each trial (baseline), after each photograph prime (post-prime), and after recalling the upsetting memory (post-memory), by having them indicate how they felt at the moment (e.g., “*How bad do you feel at the moment?*”) on a 7-point scale (1 = *Not at all*, 4 = *Somewhat*, 7 = *Extremely*).

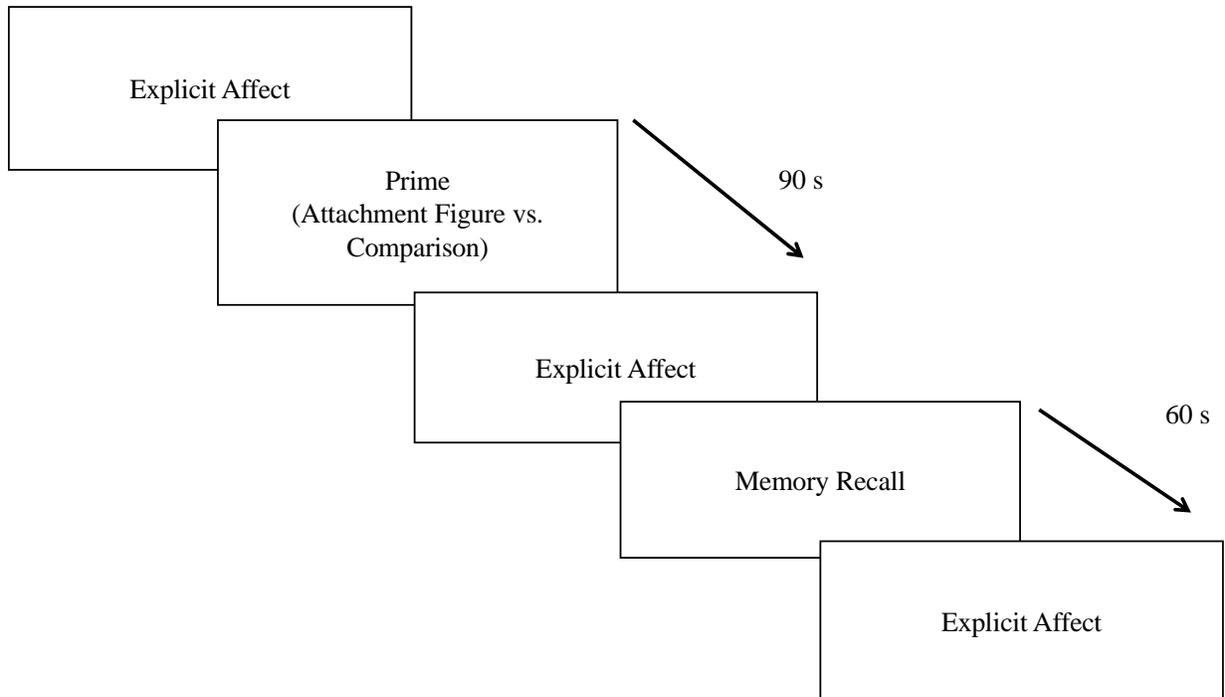


Figure 4.1. Schematic Representation of an AART Trial in Studies 1a-5. In each explicit affect block (T1, T2, & T3), affect was measured on a scale from 1 to 7. The prime effect was calculated by subtracting explicit affect at baseline (T1) from explicit affect post-prime (T2). Similarly, the buffering effect was calculated by subtracting explicit affect at baseline (T1) from explicit affect post-memory recall (T3). In each study, there was an implicit affect block following the final explicit block (T3), but since it was not significant and not the focus of this paper, it has been excluded from the figure.

**Pretest Measures.** In addition to generating cues for the negative memories that would be used to elicit negative affect in the experimental session, the pretest also contained measures of individual differences. Since past work revealed that the magnitude of a recovery effect following an internally-generated stressor was systematically related to participants' adult attachment to their partner (i.e., those lower on avoidance obtained greater affective benefits), the pretest contained measures to assess individual differences related to participants' attachment styles. Specifically, participants completed questions about their attachment to their mother or partner (ECR) (Brennan, Clark, & Shaver, 1998), closeness to their mother/partner (IOS) (Aron, Aron, & Smollan, 1992), the quality of their relationship with their mother or partner, a dispositional rumination scale adapted from the Rumination Response Styles (RRS) inventory (Treynor, Gonzalez, & Nolen-

Hoeksma, 2003), a dispositional self-control scale (BSCS) (Tangney, Baumeister, & Boone, 2004), and a 10-item Big Five Personality Inventory (BFI-10) (Rammstedt & John, 2007). These individual differences were measured since each might be expected to increase or decrease either the *prime-induced buffering effect*, the *prime-elicited effect*, or both. Investigating how these individual differences influence these two effects allows us to understand when and for whom the imagined presence of an attachment figure aids in affect regulation.

**Data Analytic Strategy.** The goal of the data analytic strategy was to quantify the extent to which the attachment figure prime helped lessen negative affect elicited by an upsetting memory recall. In Studies 1a and 1b, participants completed each trial once, for a total of two trials. Across all studies, measures of positive and negative affect were moderately negatively correlated (ranging from -.44 to -.64 in Study 1a; from -.37 to -.57 in Study 1b; from -.71 to -.85 in Study 2; from -.69 to -.83 in Study 3; from -.64 to -.76 in Study 4; from -.59 to -.76 in Study 5). Thus, at each time point, I created an aggregated negative affect variable by computing the mean of the negative items and reverse-coded positive items. Cronbach's alpha for the negative affect measure at each time point and for each prime condition were acceptable (ranging from .61 to .79 in Study 1a; .53 to .72 in Study 1b; from .88 to .94 in Study 2; from .91 to .94 in Study 3, from .89 to .93 in Study 4; from .65 to .82 in Study 5). This aggregate measure was used in all analyses, but the pattern of results was similar irrespective of whether the analyses used the aggregate measure or the separate negative and positive affect measures.

Because change in negative affect relative to baseline level was the focus of assessment, for each trial, baseline negative affect was subtracted from post-memory negative affect ( $T3 - T1$ ). Therefore, a score of zero reflects no change in negative affect as compared to baseline, a positive score reflects increased negative affect as compared to baseline, and a negative score reflects

decreased negative affect as compared to baseline. By correcting for baseline negative affect on a trial-by-trial basis within each participant, I could rule out the possibility that differences in negative affect may arise over time in the prime conditions (e.g., increasing negative affect in the later prime condition).

To test the primary buffering hypotheses, I conducted a repeated measures ANOVA with prime type as the within-participant factor. The main dependent variable was change in affect from baseline to post-memory (T1 to T3).<sup>6</sup> A mediation analysis was also performed to assess the potential mechanism by which the buffering effect operates. Specifically, the MEMORE package for SPSS (Morata & Hayes, 2017) was used to assess whether the positive feelings generated from viewing the attachment figure photograph contributed to the overall buffering effect. After including the potential mediator in the model, I derived direct effect of condition on the prime-elicited buffering effect (when including the mediator) and used a bootstrap approach to assess whether mediation was statistically significant.

## Results

**Prime-induced Buffering Effect.** With regard to the main aim of Study 1a, viewing a photograph of one's mother (vs. the yoked control) significantly dampened the negative affect triggered by the autobiographical memory recall,  $F(1,102)=3.81, p=.054, \eta_p^2=.04$ . Whereas in the yoked condition, participants reported greater negative affect following the memory recall (T3-T1;  $M=.73; SD=1.04$ ), the negative affect triggered by the memory recall was significantly less in

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<sup>6</sup> Attachment theory predicts that the buffering ability of an attachment figure will be influenced by the attachment style and relationship quality between the individual participant and attachment figure (mother; partner). However, other research suggests that close others will provide regulatory benefits regardless of the attachment style and relationship quality between the individual and attachment figure (mother; partner). The data here supports the notion that attachment figures provide affective benefits, regardless of the specific attachment style between an individual and attachment figure. I also assessed individual differences such as trait self-control, rumination, and the Big 5 personality factors, none of which significantly moderated the buffering effect.

the mother prime condition ( $M=.44$ ;  $SD=1.23$ ), where participants had viewed a photograph of their mother prior to the memory recall.

**Mediation by Prime-elicited Affect.** I examined the extent to which the preemptive buffering effect was driven by the affect spontaneously triggered by activating the mental representation of the attachment figure (i.e., change in negative affect from T1 to T2). As expected, viewing a photograph of one's mother spontaneously and reliably decreased negative affect,  $F(1,102)=13.50$ ,  $p<.001$ ,  $\eta_p^2=0.12$ . Unexpectedly, viewing a photograph of a yoked participant's mother led to a significant increase in negative affect,  $F(1,102)=7.92$ ,  $p<.001$ ,  $\eta_p^2=.07$ . The mother vs. yoked prime conditions were statistically different from one another,  $F(1,102)=20.62$ ,  $p<.001$ ,  $\eta_p^2=0.17$ , with a larger decrease in negative affect after viewing a photograph of one's mother. After controlling for prime-elicited affect, the effect of prime type was no longer a significant predictor of a *prime-induced buffering effect*,  $\beta=.01$ ,  $SE=.15$ ,  $t(100)=1.00$ ,  $p=.92$ .

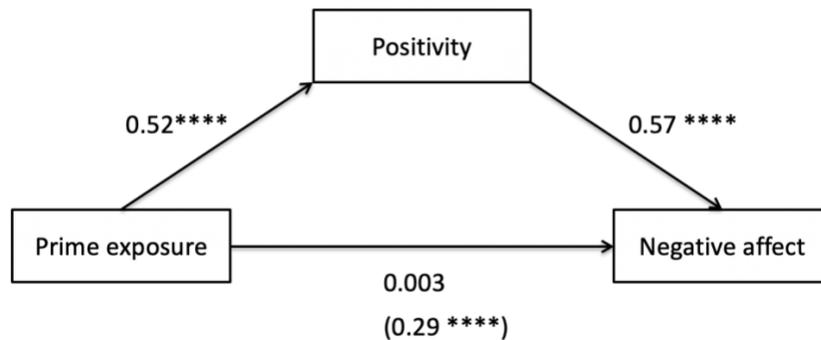


Figure 4.2. Mediation by prime-elicited positivity (mother). Slopes are unstandardized regression coefficients. \*\*\*\* indicates  $p<.0001$ .

## Discussion

Study 1a provides initial evidence that activating the mental representation of an attachment figure preemptively buffers against the negative affect triggered by an upsetting memory recall. Additionally, the mediation results indicate that this preemptive buffering effect

was driven by the positive affect spontaneously triggered by the exposure to the photograph of the attachment figure (i.e., T1 to T2).

Still, the present study has two limitations. First, the preemptive buffering effect was only marginally significant and thus does not provide strong evidence for the preemptive buffering effect. Second, the yoked prime used as the comparison condition was expected to elicit little affect (i.e., positive or negative) but actually triggered a negative reaction in participants. Thus, any difference in the buffering effect between the mother vs. yoked prime may have been due to the yoked prime eliciting negative reactions, rather than the mother prime eliciting positive, regulatory responses. To address, these concerns, I conducted a direct replication of Study 1a.

### **Study 1b**

Study 1a provided some initial evidence for a prime-induced buffering effect. However, since attachment theory predicts the buffering ability of mental representations of attachment figures through their secure base function, a direct replication of Study 1a was conducted. Thus, the aims of Study 1b were to provide further empirical support for the preemptive buffering effect and possible mechanisms via prime-elicited affect.

### **Method**

**Participants.** Ninety-one undergraduate students (69 women) from Cornell University participated in the study for course credit. The mean age of the sample was 20 (SD=1.18). Moreover, the racial composition of the sample was 55% White, 26% Asian/Pacific Islander, 9% Latino, 6% Black, and 7% other ethnicities. Given this sample size and the within-person research design, the present study had .99 statistical power to detect a medium effect (Cohen's  $d = .50$ ) using a repeated measures ANOVA.

**Procedure and materials. Overview and Design.** The material and procedures were identical to those described in Study 1a.

**Data Analytic Strategy.** The data analytic strategy was identical to that described in Study 1a.

## Results

**Prime-induced Buffering Effect.** Replicating Study 1a, viewing a photograph of one's mother (vs. a yoked control) dampened the negative affect triggered by the autobiographical memory recall,  $F(1,90)=7.28$ ,  $p<.01$ ,  $\eta_p^2=.08$ . Whereas in the yoked condition participants reported greater negative affect following the memory recall (T3-T1;  $M=.89$ ;  $SD=1.17$ ), the negative affect triggered by the memory recall was significantly lower in the mother prime condition ( $M=.51$ ;  $SD=1.08$ ), where participants had viewed a photograph of their mother prior to the memory recall.

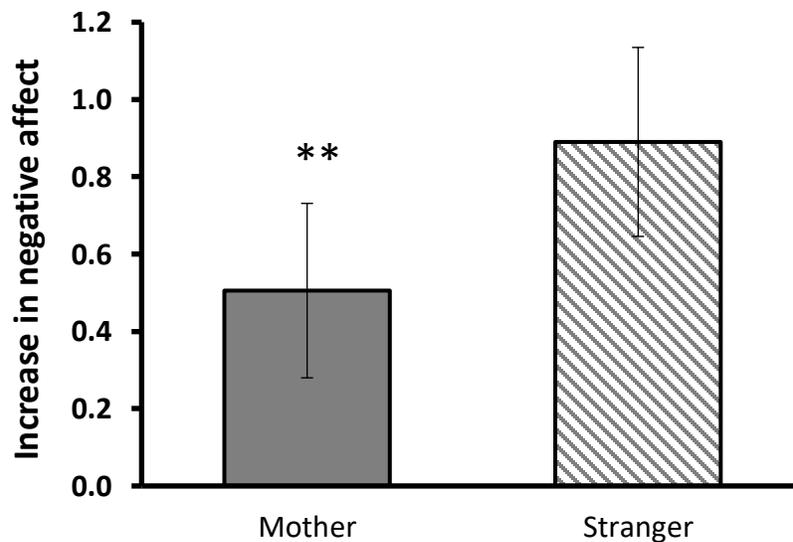


Figure 4.3 The negative affect triggered by the autobiographical memory recall in the yoked and mother prime conditions. Data are represented by mean and 95% CI, \*\* indicates  $p<.01$ .

**Mediation by Prime-elicited Affect.** Mediation results demonstrated that the affect triggered by the attachment figure (vs. yoked) prime accounted for part of the buffering effect.

Viewing a photograph of one's mother spontaneously and reliably decreased negative affect,  $F(1,90)=8.15, p<.01, \eta_p^2=.08$ . In contrast to Study 1a, and as expected, viewing a photograph of a yoked participant's mother did not elicit a significant amount of affect,  $F(1,90)=.01, p=.92, \eta_p^2<.01$ . The decrease in affect triggered by the mother (vs. yoked) prime was in the theoretically predicted direction, but did not reach statistical significance,  $F(1,90)=2.18, p=.14, \eta_p^2=.02$ . After controlling for the prime-elicited affect, the effect of prime type was weakened but still remained a significant predictor of a *prime-induced buffering effect*,  $\beta=.29, t(88)=2.24, SE=.13, p=.03$ .

## **Discussion**

Studies 1a and 1b provide initial evidence (and a direct replication) that activating the mental representation of an attachment figure preemptively buffers against the negative affect triggered by recalling an upsetting autobiographical memory. The results demonstrated that simply viewing a photograph of one's mother lessened the affective sting of a subsequent upsetting memory recall and also provided initial insights about the mechanism underlying the preemptive buffering effect. Specifically, exposure to the photograph of one's mother spontaneously elicited a positive affective response, which in turn served to lessen the negativity of the autobiographical memory recall. These findings are consistent with work by Speer and Delgado (2017) demonstrating that positive affect elicited by recalling a positive memory can reduce negative affect elicited from an acute stressor (i.e., socially evaluative cold pressor task, which involved immersing participants' hands in ice-cold water under social threat). The investigation the mechanism of the preemptive buffering effect is continued in Study 2.

## **Study 2**

Studies 1a and 1b provide initial support that activating the mental representation of one's mother lessens the affective sting of an upsetting memory recall. Although mothers continue to be

a primary caregiver and serve as a primary attachment figure throughout life, as early as adolescence individuals start to also rely on peers and partners for many attachment-related functions (e.g., affect regulation). In adulthood, romantic partners begin to play an increasing role as attachment figures and serve as the prototypical attachment figure (Hazan & Shaver, 1987; Zeifman & Hazan, 2008). Past work has shown that romantic partners provide regulatory effects (e.g., Ditzen et al, 2007; Eisenberger et al., 2011; Grewen et al., 2003) that can potentially be even stronger than those conferred by mothers (Selcuk et al., 2012). In Study 2, I aimed to examine the extent to which romantic partners serve to preemptively buffer against the detrimental effects of distressing autobiographical memories.

## **Method**

**Participants.** Thirty undergraduate students (18 women) from Cornell University participated in the study for course credit. The mean age of the sample was 20 (SD=0.5). Moreover, the racial composition of the sample was 59% White, 15% Asian/Pacific Islander, 15% Latino, 6% Black, and 6% other ethnicities. Given that past work has shown that photographs of a current romantic partner provides stronger affective regulatory benefits than photographs of mothers (Selcuk et al., 2012), a larger effect was expected in Study 2 (compared to Studies 1a and 1b). Specifically, the average effect size for the prime-elicited buffering effect across Studies 1a and 1b (using a mother photograph prime) was small,  $d=.23$ , so a medium effect size,  $d=.50$ , was expected in Study 2. With the current sample ( $N=30$ ) and the within-subjects design, I achieved .75 statistical power for the main test involving a repeated measures ANOVA.<sup>7</sup>

**Procedure and Materials. Overview and Design.** The material and procedures were the same as those described in Studies 1a and 1b, except for three differences: First, the attachment

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<sup>7</sup> In addition to the findings in which previous work has shown stronger regulatory effects in relationship partners than in mothers, the sample size was also smaller given the difficulty in recruiting participants in romantic relationships.

figure prime used in Study 2 was a photograph of the participant's current romantic partner instead of mother. Accordingly, the yoked control was the photograph of another participant's current romantic partner. Second, both conditions were presented to each participant twice, for a total of 4 trials. The responses from both trials of each condition were aggregated. Third, at all time points (T1-T3), I assessed affect with six items (i.e., *good*, *bad*, *comfortable*, *uncomfortable*, *calm*, and *upset*), which were again aggregated to form one negative affect score.

**Data Analytic Strategy.** The data analytic strategy was the same as that described in Studies 1a and 1b except for two differences. First, the aggregated affect scores for all time points (T1, T2, T3) were now computed from 6 target words (i.e., *good*, *bad*, *comfortable*, *uncomfortable*, *calm*, and *upset*) instead of 2 (i.e., *good*, *bad*).<sup>8</sup> Second, since participants completed each trial twice, for a total of four trials, I averaged the buffering effect scores (T1 to T3) across trials of the same prime after performing the baseline correction.

## Results

**Prime-induced Buffering Effect.** Importantly, viewing the photograph of one's partner (vs. the yoked control) dampened the negative affect triggered by the upsetting memory recall,  $F(1,29)=7.20$ ,  $p=.01$ ,  $\eta_p^2=.20$ . Whereas in the yoked condition, participants reported greater negative affect following the memory recall (T3-T1;  $M=.64$ ;  $SD=.88$ ), the negative affect triggered

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<sup>8</sup> This study was the first to include 6 target words – two words related to general positivity (i.e., *good*, *bad*) and four words related to attachment-related feelings (i.e., *calm*, *upset*, *comfortable*, *uncomfortable*). I computed two indices: a positivity index (alphas ranging from .77 to .92 in Study 2; from .77 to .83 in Study 3; and from .66 to .81 in Study 5) and attachment-related index (alphas ranging from .82 to .91 in Study 2; from .87 to .92 in Study 3; and from .83 to .89 in Study 5). This allowed us to assess whether the buffering effect is driven by attachment-related affect specifically or positivity more generally. Specifically, the buffering hypothesis was tested via a repeated measures ANOVA with prime type (partner vs. yoked) and index type (positivity vs. attachment) as the within-participant factors (the main dependent variable was change in positivity and attachment-related affect from baseline to post-memory). Since I did not observe a significant interaction that would have indicated that the buffering effect differs as a function of index, I did not further investigate. Instead, I investigated whether the buffering effect is driven by attachment-related feelings vs. generally positivity by directly manipulating these factors in Studies 4 and 5.

by the memory recall was significantly less in the partner prime condition ( $M=.22$ ;  $SD=.85$ ), where participants had viewed a photograph of their partner prior to the memory recall.

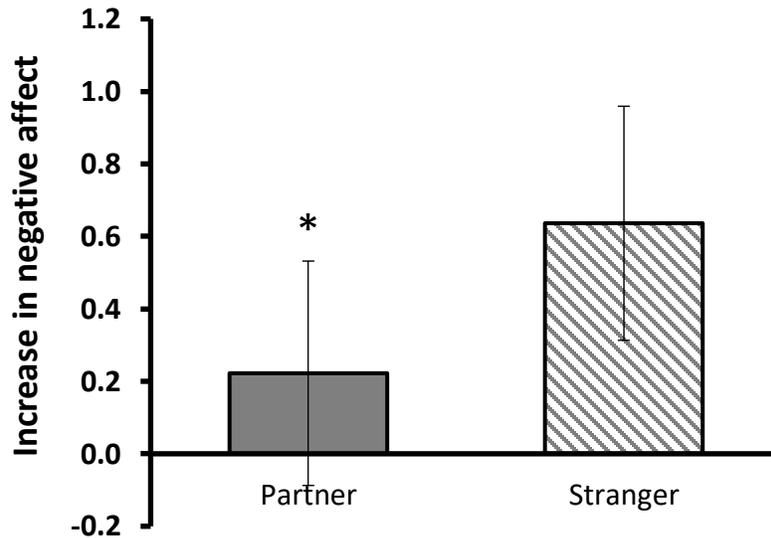


Figure 4.4 The negative affect triggered by the autobiographical memory recall in the yoked and partner prime conditions. Data are represented by mean and 95% CI, \* indicates  $p < .05$ .

**Mediation by Prime-Elicited Affect.** Mediation results demonstrated that the affect triggered by the attachment figure prime contributed to the buffering effect. Viewing the photograph of one's partner reliably decreased negative affect,  $F(1,29)=24.22$ ,  $p < .001$ ,  $\eta_p^2=.46$ , whereas viewing a photograph of a yoked participant's partner did not,  $F(1,29)=.01$ ,  $p=.93$ ,  $\eta_p^2 < .001$ . This decrease in negative affect triggered by the photograph prime was significantly greater in the partner (vs. yoked) prime condition,  $F(1,29)=16.20$ ,  $p < .001$ ,  $\eta_p^2=.36$ . After controlling for prime-elicited affect, the effect of prime type was no longer a significant predictor of the *prime-induced buffering effect*,  $\beta=.003$ ,  $SE=.14$ ,  $p=.98$ .

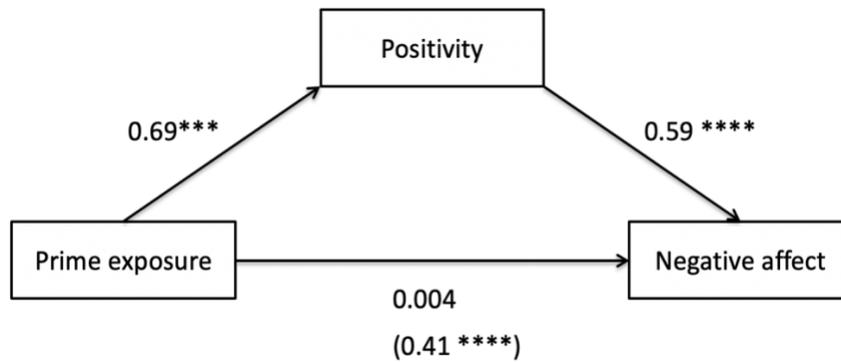


Figure 4.5. Mediation by prime-elicited positivity (partner). Slopes are unstandardized regression coefficients, \*\*\*\* indicates  $p < .0001$ .

## Discussion

Study 2 demonstrated that simply bringing to mind the mental representation of one's relationship partner (i.e., a brief exposure to their photograph) preemptively buffers against the affective consequences of an upsetting memory recall. Moreover, the results replicated the mediation results from Studies 1a and 1b, providing further support that the buffering effect is driven by the affective benefits resulting from the activation of the mental representation of one's attachment figure.

## Study 3

Studies 1a, 1b, and 2 provide clear evidence that activating the mental representation of an attachment figure (e.g., mother or partner) can dampen the affective sting of recalling a distressing personal memory. However, one concern is that all three studies used a photograph of an unknown other as the control prime. This could potentially be problematic, since exposure to unknown others can lead to negative affective states such as "stranger anxiety" (Field, 2008; Sroufe, 1977; Thompson & Limber, 1990; Waters, Matas, & Sroufe, 1975). This raises an alternative explanation: Perhaps being primed with a stranger's photograph increased negative affect, rather than the attachment figure prime decreasing negative affect, thereby leading us to erroneously

conclude that the mental representation of an attachment figure can preemptively buffer against internally generated negative affect. I addressed this possibility in Study 3 ( $n=43$ ), which used a neutral object (i.e., chair; hanger) as the control prime. These neutral objects were selected from the International Affective Picture System (IAPS) based on their neutral affect ratings (Lang, Bradley, & Cuthbert, 2008). Since being primed with a neutral object will not increase negative affect, I can be confident that any difference between conditions that indicates a significant preemptive buffering effect can be attributed to a smaller increase in negative affect following exposure to the attachment figure prime as opposed to a greater increase in negative affect following exposure to the stranger prime. Additionally, I again assessed whether the prime-induced buffering effect results are driven by the affective benefits resulting from the activation of the mental representation of one's relationship partner.

## **Method**

**Participants.** Forty-three undergraduate students (33 women) from Cornell University participated in the study for course credit. The mean age of the sample was 20 ( $SD=1.89$ ). Moreover, the racial composition of the sample was 56% White, 17% Asian/Pacific Islander, 13% Latino and 13% Black, and 1% other ethnicities. Since the romantic partner prime used in Study 2 did indeed lead to a larger buffering effect than the mother primes used in Studies 1a and 1b, I continued to use a romantic partner as the attachment figure prime. Based on the effect size from Study 2 ( $d=.49$ ), I determined that 35 participants were needed to achieve a statistical power of .80. By recruiting 43 participants, the present study achieved a statistical power of .88 for the primary analysis (i.e., buffering effect – repeated-measures ANOVA).

**Procedure and Materials. *Overview and Design.*** The materials and procedures in Study 3 were the same as those described in Study 2 except for one difference: a photograph of a neutral

object (i.e., chair; hanger) was used as the control prime. A neutral object prime was chosen for the control condition as opposed to a stranger prime to ensure that the control prime was purely neutral and would not elicit either positive or negative affect. These photographs were selected from the International Affective Picture System (IAPS) based on their neutral affect ratings (Lang, Bradley, & Cuthbert, 2008).

**Data Analytic Strategy.** The data analytic strategy was the same as that described in Study 2.

## Results

**Prime-Induced Buffering Effect.** Viewing a photograph of the partner (vs. neutral object) significantly dampened the negative affect triggered by the autobiographically memory recall,  $F(1,42)=6.81, p=.01, \eta_p^2=.14$ . The increase in negative affect triggered by the upsetting memory recall was significantly greater following exposure to the neutral object prime (T3-T1;  $M=.59$ ;  $SD=.67$ ) than it was when it followed exposure to the partner prime ( $M=.30$ ;  $SD=.82$ ).

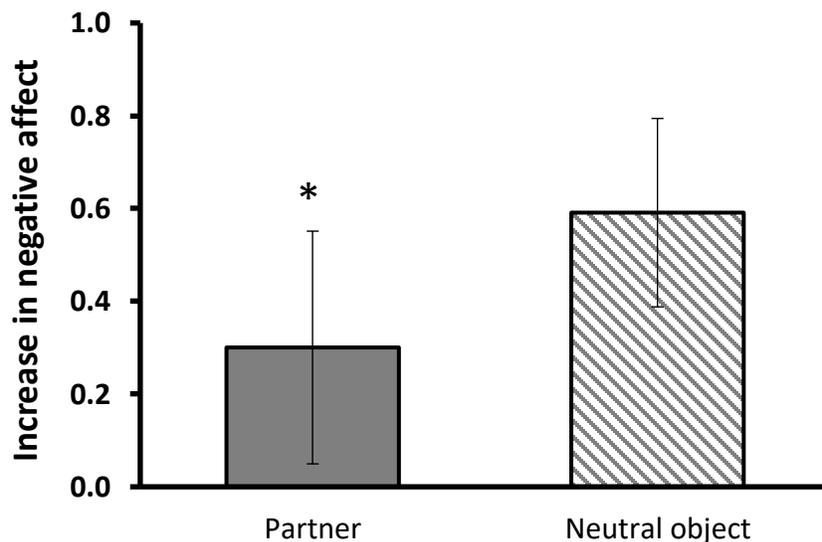


Figure 4.6 The negative affect triggered by the autobiographical memory recall in the neutral object and partner prime conditions. Data are represented by mean and 95% CI, \*  $p<.05$ .

**Mediation by Prime-Elicited affect.** Mediation results demonstrated that the affect triggered by the attachment figure prime led to the buffering effect of the attachment figure prime. Also replicating the pattern of results of Studies 1a-2, viewing a photograph of one's partner reliably decreased negative affect,  $F(1,42)=29.19$ ,  $p<.001$ ,  $\eta_p^2=.41$ . However, viewing a photograph of a neutral object did not,  $F(1,42)=2.63$ ,  $p=.11$ ,  $\eta_p^2=.06$ . Importantly, the partner prime decreased negative affect more than the neutral object,  $F(1,42)=23.32$ ,  $p<.001$ ,  $\eta_p^2=.36$ . After controlling for prime-elicited affect, the effect of prime type was no longer a significant predictor of a *prime-induced buffering effect*,  $\beta=-.13$ ,  $SE=.13$ ,  $t(40)=-.98$ ,  $p=.33$ .

## **Discussion**

Study 3 replicated the findings from Study 2 in which merely viewing a photograph of one's romantic partner served to preemptively buffer against the negative affect triggered by the recall of a distressing personal memory. Importantly, Study 3 utilized a neutral object (vs. yoked stranger) as the control prime. Thus, Study 3 provided stronger evidence that attachment figures preemptively buffer against internally generated negative affect, rather than strangers increasing negative affect or making one more sensitive to distressing memories. Study 3 also replicated the findings from Studies 1a – 2, which suggested that the buffering effect is driven by the negative affect elicited by viewing a photo of a relationship partner.

## **Study 4**

So far, I have provided clear evidence that the imagined presence of attachment figures can decrease the negative affect elicited by an upsetting memory recall. The findings reported so far raise two related questions: How do attachment figures provide these regulatory effects and are there other stimuli of the environment (e.g., objects; other people) that can produce similar affective benefits? One perspective is that attachment figures serve special and unique regulatory

functions (Bowlby, 1982; Gump et al., 2001; Mikulincer & Shaver, 2007; Simpson, Rholes, & Nelligan, 1992). In line with this perspective, people readily rely on partners and parents when in need, and don't direct such attachment-related behaviors towards unknown others or even familiar others (Fraley & Davis, 1997; Hazan et al., 1991). Indeed, work by Eisenberger and colleagues (2011) provides support for the idea that attachment figures may serve as a safety signal. Moreover, a growing body of evidence supports the idea that close attachment ties are hugely important for psychological and well-being and that those without such ties or with weaker ties are vulnerable to various mental and physical health concerns.

Still, another perspective proposes that people are social by nature and can therefore obtain regulatory benefits even from unknown others (Horton & Wohl, 1956; Quigley, Lindquist, & Barrett, 2014). Work by Coan et al. (2006), for example, shows that women anticipating a mild electric shock showed the greatest reduction in activation of neural areas involved in the regulation of pain when holding the hand of their spouse, but still obtained some regulatory benefits by holding the hand of the female experimenter. Although this work focused on physical presence in response to an external threat, it is possible that the regulatory benefits would extend to people who are not just attachment figures.

In the present work, I examined the ability of a self-chosen celebrity to provide regulatory benefits (Horton & Wohl, 1956; Quigley, Lindquist, & Barrett, 2014). A self-chosen celebrity is an important comparison condition because, similar to an attachment figure, a self-chosen celebrity is viewed highly favorably and is likely to spontaneously elicit positive reactions (Hoffman & Tan, 2015; Lang et al., 2008; Quigley, Lindquist, & Barrett, 2014). Moreover, people often hold attachment-like feelings towards celebrity, feeling as if they have relationships with them—a phenomenon that has been referred to as “parasocial interaction” (Horton & Wahl, 1956). Given

that the findings from Studies 1a, 1b, 2, and 3 provide support for the idea that the positive affective response spontaneously elicited by viewing a photograph of an attachment figure is sufficient to drive the preemptive buffering effect, I might expect that celebrities would elicit a similar response.

In Study 4, I tested the hypothesis that a self-chosen celebrity elicits preemptive buffering. I also aimed to replicate the prime-elicited preemptive buffering effect triggered by romantic partners. Because Study 4 included two primes that elicit positive affect (i.e., romantic partner; chosen celebrity), I also used multilevel modeling (MLM) to compare responses with those elicited by the yoked controls used in Studies 1a, 1b, and 2. By manipulating positivity and comparing the buffering effect of the attachment figure to that of the self-chosen celebrity, I directly assessed whether the buffering effect operates via positivity spontaneously triggered by the mental representation of the attachment figure.

## **Method**

**Participants.** Thirty-two undergraduate students (27 women) from Cornell University participated in the study for course credit. The mean age of the sample was 20 (SD=1.29). Moreover, the racial composition of the sample was 40% White, 33% Asian/Pacific Islander, 12% Latino, 3% Black, and 12% other ethnicities. Since the romantic partner prime used in Studies 2 and 3 led to a buffering effect with a medium effect size of  $\eta_p^2=.20$  and  $\eta_p^2=.14$ , respectively, I again used a similar sample size and achieved a statistical power of .78 for the primary analysis (i.e., buffering effect - repeated measures ANOVA).

**Procedure and Materials. *Overview and Design.*** The materials and procedures used in Study 4 were the same as Studies 1a and 1b with the following exceptions. First, participants completed each trial from both experimental conditions twice, for a total of 4 trials (like in Studies 2 and 3). Second, the prime for the comparison condition was a participant-chosen celebrity. In

the pretest session, each participant was presented with the photograph (headshot only) and name of six popular opposite-sex celebrities and asked to choose “the person whom is most familiar to you and whom you like the most.” The photograph of the celebrity chosen was used as a prime, along with the photograph of their romantic partner, in the AART. Specifically, male participants were presented with *Anne Hathaway, Halle Barry, Jennifer Aniston, Jennifer Lawrence, Mila Kunis, and Reese Witherspoon*, while female participants were presented with *Bradley Cooper, Dwayne Johnson, Leonardo DiCaprio, Mark Wahlberg, Robert Downey Jr., and Will Smith*.

**Data Analytic Strategy.** Like in Studies 1a-1b, the aggregated affect scores for all time points (T1, T2, T3) were computed from 2 affect words (i.e., *good, bad*). But like in Studies 2-3, participants completed 4 total trials and I averaged the buffering effect scores (T1 to T3) across trials of the same prime after performing the baseline correction. For the main analyses, I used multilevel models (MLMs) to compare the buffering ability of each of present conditions (i.e., partner; celebrity) with the buffering ability of the yoked controls from Studies 1a, 1b, and 2. Like in previous studies, condition was the predictor and the prime-elicited buffering effect (T1-T3) was the dependent variable for both MLMs. In both models, the intercept was treated as a random effect at the levels of participant and study and as a fixed effect for condition. The slope for condition was also treated as fixed since the effect of condition did not significant vary between participants.

## **Results**

**Prime-Induced Buffering Effect.** MLMs were used to separately compare the partner and celebrity primes to the yoked controls from Studies 1a, 1b, and 2. Viewing a photograph of the partner (vs. yoked controls from Studies 1a, 1b, and 2) significantly dampened the negative affect triggered by the autobiographically memory recall,  $b=.31$ ,  $SE=.06$ ,  $F(1,603.92)=23.59$ , 95% CI

[.19, .44],  $p < .0001$ . But importantly, viewing a photograph of a self-chosen celebrity (vs. yoked controls from Studies 1a, 1b, and 2) also significantly dampened the negative affect triggered by the autobiographically memory recall,  $\beta = .32$ ,  $SE = .06$ ,  $F(1,603.32) = 25.40$ , 95% CI [.20, .45],  $p < .0001$ . There was no statistical significant difference between partner ( $M = .27$ ,  $SD = .65$ ) and celebrity ( $M = .22$ ,  $SD = .82$ ) primes in their ability to dampen the negative affect triggered by the autobiographically memory recall,  $\beta = .03$ ,  $SE = .11$ ,  $F(1,31) = .12$ ,  $p = .74$ ,  $\eta_p^2 = .01$ .

**Effect of Prime Exposure.** I expected that exposing participants to a self-chosen celebrity would spontaneously elicit positive affect (Hoffman & Tan, 2015; Quigley, Lindquist, & Barrett, 2014). This was in fact the case; viewing the photograph of a self-chosen celebrity significantly decreased negative affect,  $F(1,31) = 20.03$ ,  $p < .001$ ,  $\eta_p^2 = .39$ . Replicating the results of Study 3, viewing the photograph of one's partner also reliably decreased negative affect,  $F(1, 31) = 8.59$ ,  $p < .01$ ,  $\eta_p^2 = .22$ . Decreases in negative affect between the two prime conditions were not significantly different from one another,  $F(1,31) = 1.07$ ,  $p = .31$ ,  $\eta_p^2 = .03$ .

## Discussion

Study 4 was designed to replicate the preemptive buffering effect observed in Studies 1a-3, but also to more closely investigate the mechanism underlying the preemptive buffering effect. To do so, Study 4 directly manipulated the purported mediator (i.e., positivity) by exposing participants to a photograph of their self-chosen celebrity. The results replicated the ability of attachment figures to preemptively buffer against internally generated negative affect, providing further evidence for the replicability and robustness of the effect.

Thus far, the results suggest that the preemptive buffering effect is driven by the positivity elicited by the prime. But in all the studies, the primes have been social in nature, which means they may be influencing both general positivity and more specific attachment-related feelings.

Thus, in the next study, I examined the extent to which general positivity accounts for the preemptive buffering effect independent of attachment-related feelings.

### **Study 5**

Research using fMRI has found that viewing a photograph of an attachment figure activates various neural areas (Aron et al., 2005; Bartels & Zeki, 2004; Eippert et al., 2008; Eisenberger et al., 2011). Some areas are part of the opioid system and are implicated in the lessening of pain and associated with the subjective experience of comfort and safety (Eippert et al., 2008; Eisenberger et al., 2011; Kim & Richardson, 2009; McNally & Westbrook, 2003). Other parts, however, are part of the dopaminergic system, which is implicated in the processing of various rewards (social and nonsocial) and associated with the subjective experience of pleasure or positivity (Aron et al., 2005; Bartels & Zeki, 2004). Since the self-chosen celebrity from Study 4 was shown to elicit attachment-related feelings as well as general positivity, the test was not capable of fully demonstrating whether positivity is sufficient to elicit the preemptive buffering effect. Therefore, in Study 5, I again directly manipulated positivity, but this time using a positive object photograph (i.e., fireworks; castle) as the control prime, since it will elicit positivity but not feelings of comfort and safety. The control photographs were selected from the International Affective Picture System (IAPS) based on their positive affect ratings (Lang, Bradley, & Cuthbert, 2008). If the positive object provides a preemptive buffering effect, it will provide evidence that positivity is sufficient to produce the buffering effect.

If positivity is sufficient to produce the preemptive buffering effect, then there should not be a statistically significant difference between the attachment figure condition (i.e., partner) and positive control condition (i.e., positivity-eliciting photograph). However, if attachment-related feelings are necessary to drive the buffering effect, then exposure to the attachment figure prime

should create a significantly stronger buffering effect than exposure to the positive object prime. Similarly, if the buffering effect elicited from exposure to either the photograph of the partner or positive object is compared to the buffering effect elicited from exposure to the neutral controls from Studies 1a-2, both the partner and positive object photographs ought to produce a significantly stronger preemptive buffering effect, demonstrating that positivity is sufficient to drive the preemptive buffering effect demonstrated in these studies.

## **Method**

**Participants.** Sixty-five undergraduate students (42 women) from Cornell University participated in the study for course credit. The mean age of the sample was 19 (SD=1.63). Moreover, the racial composition of the sample was 52% White, 20% Asian/Pacific Islander, 13% Latino, 11% Black, and 4% other ethnicities. Since the romantic partner prime used in Studies 2 and 3 led to a buffering effect with a medium effect size ( $\eta_p^2=.20$  and  $\eta_p^2=.14$ , respectively) I again used a similar sample size and achieved a statistical power of .98 for the primary analyses.

**Procedure and Materials. *Overview and Design.*** The materials and procedures used in Study 5 were the same as Studies 2 and 3 with the exception of the primes used. Here, one of two positive object photographs (i.e., castle; fireworks) was used as the positive affect prime because these positive images elicit positivity without eliciting any attachment-related feelings. The control photographs were selected from the International Affective Picture System (IAPS) based on their positive affect ratings (Lang, Bradley, & Cuthbert, 2008).

**Data Analytic Strategy.** The data analytic strategy was the same as that described in Studies 2, 3, and 4. Like in Study 4, I used multilevel models (MLMs) to compare the buffering ability of each of these primes (i.e., partner; positive objective) to the buffering ability of the yoked stranger controls from Studies 1a, 1b, and 2. For the assessments of the buffering ability of both

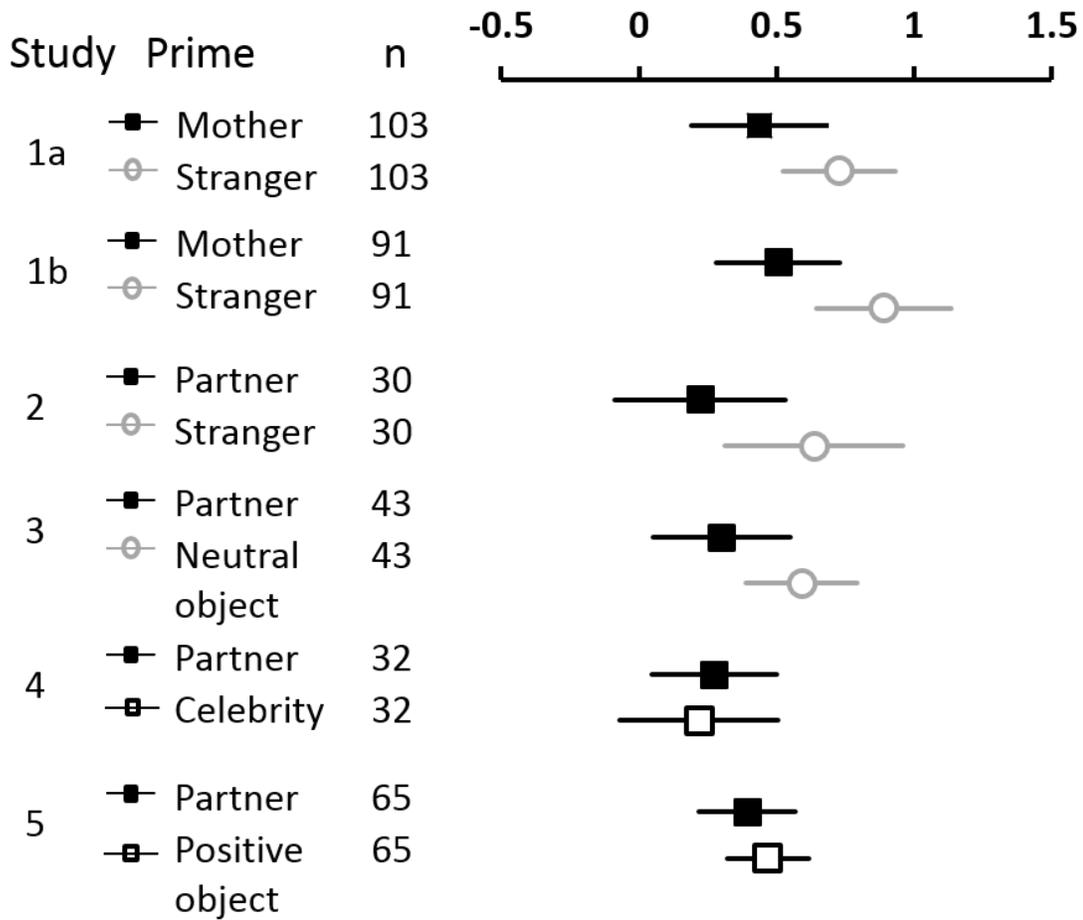
the partner and positive object primes (vs. yoked stranger primes from Studies 1a-2), the intercept was treated as a random effect at the levels of participant and study and as a fixed effect for condition. The slope for condition was also treated as fixed since the effect of condition did not significantly vary between participants.

## Results

**Prime-Induced Buffering Effect.** As expected, viewing a photograph of the partner (vs. yoked controls from Studies 1a, 1b, and 2) significantly dampened the negative affect triggered by the autobiographically memory recall,  $\beta=.27$ ,  $SE=.06$ ,  $F(1,45.25)=19.19$ , 95% CI [.15, .39],  $p<.0001$ . Similarly, viewing a photograph of a positive object (vs. yoked controls from Studies 1a, 1b, and 2) significantly dampened the negative affect triggered by the autobiographically memory recall,  $b=.24$ ,  $SE=.06$ ,  $F(1,43.51)=15.72$ , 95% CI [.12, .37],  $p<.0001$ . Moreover, there was no statistically significant difference between partner ( $M=.39$ ,  $SD=.71$ ) and positive object ( $M=.47$ ,  $SD=.60$ ) primes in their ability to dampen the negative affect triggered by the autobiographically memory recall,  $\beta=.03$ ,  $SE=.11$ ,  $F(1,64)=.50$ ,  $p=.48$ ,  $\eta_p^2=0.01$ , suggesting that positivity is sufficient to produce the buffering effect.

**Effect of Prime Exposure.** As expected, viewing a photograph of the positive object spontaneously decreased negative affect,  $F(1, 64)=15.88$ ,  $p<.001$ ,  $\eta_p^2=.19$ . Similarly, the partner prime also reliably decreased negative affect,  $F(1,64)=46.41$ ,  $p<.001$ ,  $\eta_p^2=.42$ . Providing support for the notion that positivity is sufficient to drive the buffering effect, prime-elicited affect did not significantly differ between the partner and positive object primes,  $F(1, 64)=2.64$ ,  $p=.11$ ,  $\eta_p^2=.04$ .

**A**



**B**

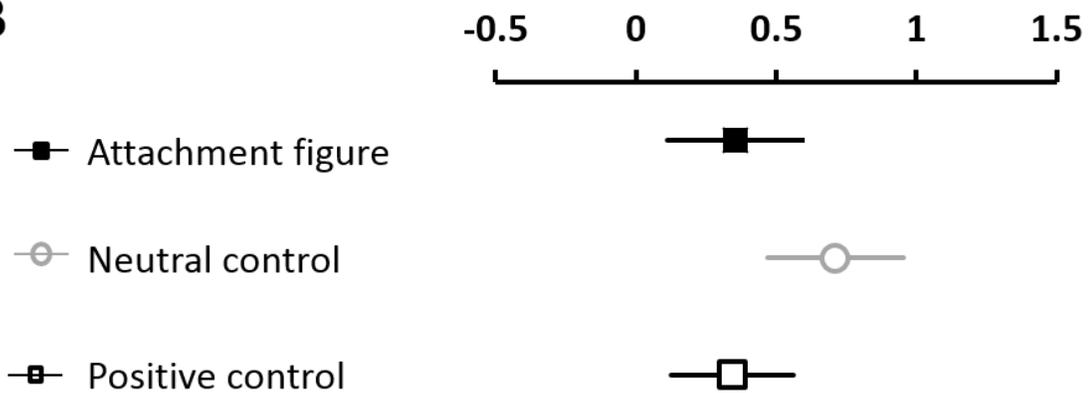


Figure 4.7. A visual representation of the change in affect from T1 to T3 (buffering effect). A) Individual studies 1a-5; B) combined results for attachment figures, neutral and positive controls from studies 1a-5. The black squares indicate attachment figure conditions (mother; relationship partner), the empty circles represent the yoked control conditions, and the empty squares represent the positive affect control conditions. This visual representation shows that the positive control conditions are similar to the attachment figure conditions, and that both the attachment figure and the positive control conditions are significantly different than the yoked control conditions.

## **Discussion**

The results from Study 5 provide the most robust evidence that the positivity elicited from the attachment figure primes is sufficient to drive the preemptive buffering effect. Specifically, exposure to both the attachment figure prime and the positive object prime led to a significantly stronger buffering effect compared to the yoked controls from Studies 1a, 1b, and 2, yet they did not significantly differ from each other. If the attachment-related feelings were necessary to produce the buffering effect, then I would have found significant differences in terms of the buffering effect when comparing the attachment figure prime and the positive object prime. By directly manipulating positivity without manipulating attachment-related feelings such as comfort or support, I can be confident that the prime-elicited buffering effect can be produced solely via general positivity.

## **Study 6**

Since the primary motivating question, procedure, and data analytic strategy from Studies 1a-5 were similar, a meta-analysis was conducted using the combined data from all previous studies. This approach increased the statistical power and reliability of the analyses, allowing us to more conclusively assess whether the imagined presence of an attachment figure can preemptively buffer against internally generated negative affect and whether this effect operates via prime-elicited positivity. Moreover, combining the data from Studies 1a-5 into three groups provided the opportunity to present a more simplified demonstration of the buffering ability of attachment figures relative to both the neutral controls and positive controls, independently.

## **Method**

**Overview and design.** Since the design and procedure of each study was similar and based on data collected from the same measures, I was able to assess and compare the combined

buffering ability of each prime type. To do this, I combined the data from all of the studies in order to create three groups: 1) an attachment figure group (Condition 1 from Studies 1a-5), 2) a neutral control group (Condition 2 from Studies 1a-3), and 3) a positive control group (Conditions 2 from Studies 4-5). This design allowed me to more conclusively assess whether the imagined presence of an attachment figure can preemptively buffer against internally generated negative affect and whether this effect operates via prime-elicited positivity. Since these groups were based on data from separate studies that varied in terms of sample size, a multi-level model (MLM) was used to assess their relative buffering abilities. Overall, this approach was beneficial since it increased the statistical power and reliability of the main analyses and also allowed for comparisons across studies.

**Data Analytic Strategy.** The buffer effect was computed via the same process used in all previous studies. However, in order to account for the data coming from different studies that varied in sample size, a multilevel model (MLM) was used to compare the buffering ability of the aggregated groups: 1) attachment figure group (mother or partner primes from Studies 1a-5), 2) neutral control group (yoked stranger primes from Studies 1a-2 and neutral object prime from Study 3), and 3) positive control group (celebrity prime from Study 4 and positive object prime from Study 5). For each MLM, I treated the aggregated prime groupings as a fixed effect and the intercept as a random effect at the levels of participant and study.

## **Results**

**Prime-Induced Buffering Effect.** I used MLM to separately compare the attachment figure aggregate with the neutral control aggregate. Exposure to the attachment figures (vs. neutral controls) significantly dampened the negative affect triggered by the autobiographically memory recall,  $\beta = -.17$ ,  $SE = .03$ ,  $F(1,391.21) = 24.05$ , 95% CI [-.24, -.10],  $p < .001$ . Similarly, exposure to the

positive controls (vs. neutral controls) significantly dampened the negative affect triggered by the autobiographically memory recall,  $\beta=-.24$ ,  $SE=.05$ ,  $F(1,649.53)=20.61$ , 95% CI [-.34, -.13],  $p<.001$ . As predicted, there was no statistically significant difference between exposure to the attachment figures and positive controls in their ability to dampen the negative affect triggered by the autobiographically memory recall,  $\beta=.01$ ,  $SE=.09$ ,  $F(1,93.92)=.01$ , 95% CI [-.17, .19],  $p=.92$ .

## **Discussion**

The meta-analytic approach used in the present study increased the statistical power of the primary analyses, thus allowing for a stronger and more reliable test of the buffering ability of the imagined presence of attachment figures. Moreover, this approach allowed for a more simplistic demonstration of both the primary finding (i.e., the preemptive buffering ability of attachment figures) and secondary finding (i.e., the process through which this buffering effect occurs) demonstrated in the present work. Specifically, this work demonstrated that the imagined presence of an attachment figure can preemptively buffer against the negative affect elicited from an upsetting autobiographical memory (as demonstrated by its comparison with the buffering ability of neutral control primes) and that the positivity elicited from the exposure to an attachment figure prime is sufficient to drive this buffering effect (as demonstrated by its comparison with positive control primes). These findings advance our understanding of the regulatory functions of attachment figures by providing direct evidence that the imagined presence of an attachment figure can regulate subjectively experienced affective reactions and that this effect can result from general positivity and therefore does not exclusively rely on the influence of attachment-related feelings (i.e., comfort; support).

## General Discussion

To what degree can close others help an individual to regulate negative affective reactions to upsetting situations? Although it seems intuitive that a close other could help an individual recover from a negative experience by being physically present and supportive, could simply viewing the photograph of that same individual prior to the experience of negative affect confer the same type of regulatory benefits? Imagine an individual has received an email that could potentially contain very negative news. If that person glances at the photograph of their partner that is sitting on their desk, will they be preemptively buffered against any negative affect that could potentially result from the email? Across six studies, the present findings provide strong support for the notion that the imagined presence of an attachment figure, whether a mother (Studies 1a and 1b) or current romantic partner (Studies 2-5), can *preemptively* buffer against the negative affect elicited from an internal-generated stressor (i.e., a personally relevant upsetting memory recall). Although the ability of attachment figures to facilitate recovery following an upsetting memory recall has been previously established (Selcuk et al., 2012), the present work shows that regulatory benefits provided by the imagined presence of an attachment figure can occur *preemptively*—i.e., prior to an upsetting memory recall. Moreover, using mediational analyses and direct manipulations via the use of novel control conditions, I provide evidence that the preemptive buffering effect occurs via the positivity spontaneously triggered by activating the attachment representation. These findings are in line with a rich and abundant literature on the role of attachment figures in regulating physiological responses. Below I interpret the implications of the present findings in light of this theoretical and empirical context.

## **Implications for Social Regulation**

The ability of attachment figures to help individuals regulate physiological responses to external stressors, especially ones involving pain, have been well documented (Brown et al., 2003; Coan et al., 2006; Ditzen et al., 2007; Ditzen et al., 2008; Jackson et al. 2005). Nonetheless, many questions remain about how attachment figures, including their imagined presence, shape subjective affective reactions to negative affective experiences. In particular, less attention has been given to how simple reminders influence subjective affective experiences to emotionally charged, internally generated stressors and the extent to which the timing of the activation of the mental representation (i.e., before or after the stressor) affects the regulation.

The present work demonstrates that activating the mental representation before bringing to mind a distressing event lessens the affective sting of the memory. Compared to an unknown other or a neutral object, viewing a photograph of one's mother or partner provided protective buffering. To my knowledge, few studies have investigated whether activating the mental representation *prior* to the stressor can serve to preemptively buffer against negative affect. That is, the majority of research has focused on how activating the mental representation after the stressor can facilitate restoring baseline physiological equanimity (Beckes, Simpson, & Erickson, 2010; Mikulincer & Shaver, 2007). The only other studies that suggest the possibility of preemptive buffering (vs. recovery effects) actually follow procedures in which the mental representation of the attachment figure is active during and throughout the negative affective experience (Eisenberger et al., 2011; Overall, Simpson, & Struthers, 2013; Pederson & Moran, 1996; Schuengel & Janssen, 2006). Although this is different than a typical recovery effect, it is still not completely preemptive, and therefore makes it difficult to conclude that the secure base function of attachment figures can indeed preemptively buffer against negative affect.

It is also worth noting that the discrepancy between the nonsignificant buffering effects found in earlier work (Selcuk, et al., 2012) and the significant effects found here could highlight an important boundary condition. In the previous work by Selcuk and colleagues (2012), negative affect was elicited by instructing participants to “let your deepest thoughts and emotions about this experience run through your mind” (Kross et al., 2011). In the present work, participants were simply presented with a 2 to 3-word cue to remind them of their negative autobiographical memory and told to “think and write about the associated event in the textbox below.” These instructions, which did not direct the participants to explicitly focus on their deepest thoughts and emotions, resulted in the demonstration of significant preemptive buffering effect. This suggests that the imagined presence of an attachment figure might be effective in preemptively buffering against negative affect when individuals naturally and spontaneously recall a negative memory but ineffective when participants are explicitly told to focus on the deepest, most negative thoughts and emotions associated with the memory.

### **Implications for Adult Attachment**

The results reported here demonstrate that the mental representation of an attachment figure buffers against negative affect regardless of the attachment style and relationship quality of the participant and attachment figure. According to attachment theory, these factors both ought to influence the regulatory ability of the attachment figure (Carpenter & Kirkpatrick, 1996; Coan, 2008; Diamond, Hicks, & Otter-Henderson, 2008; Ditzen et al, 2008; Mikulincer & Shaver, 2007; Zayas & Shoda, 2005). However, other evidence suggests that attachment figures will serve regulatory functions and provide affective benefits regardless of the attachment style and the quality of the relationship (Bowlby, 1982; Selcuk et al. 2010). The findings presented here provide additional support for the notion that close others play role that is so significant for the regulation

of emotions that the regulatory effects can occur even in relationships that are not normally associated with these benefits.

The attachment literature has a large body of work demonstrating the regulatory functions of attachment figures and their implications. However, these regulatory benefits have generally been attributed to specific attachment-related feelings like comfort and support that are elicited from interactions with attachment figures. However, the results indicate that positivity alone is sufficient to buffer against internally generated negative affect, since the positivity elicited from the photographs of mothers, relationship partners, celebrities, and positive objects (vs. neutral controls) mediated the prime-elicited buffering effect. If positivity was not sufficient to produce the buffering ability and attachment-related feelings were necessary, then the strength of the buffering effect resulting from the positive objective prime would not have been equivalent to the buffering effect of the partner prime demonstrated in Study 5. Moreover, the identification of positivity as the mechanism driving the buffering effect aligns with extant work demonstrating that the positivity elicited from positive memories can reduce negative affect elicited from an acute stressor (Speer & Delgado, 2017). Although the present work comprehensively demonstrated that positivity is sufficient to create this buffering effect, future work could provide further support by measuring the activation of associated neural regions. Specifically, since general positivity is associated with the dopaminergic pathway and attachment-related feelings are related to the endogenous opioid system, future research ought to assess the activation of these neural markers during the preemptive buffering process.

It is also noteworthy that a self-generated celebrity and positive object both had the capability of preemptively buffering against negative affect to the same degree as the attachment figures (i.e., mother; relationship partner). The mental representation of an attachment figure is

expected to elicit positivity, similar to a positive object and a celebrity, but it is also assumed to elicit other neural and affective responses that reflect the unique importance of this relationship in people's lives (Eisenberger et al., 2011). Thus, from an attachment perspective, the indistinguishability of attachment figures from other positive stimuli may at first glance seem perplexing and at odds with theory. However, I believe that it is neither. First, the present findings showing that positivity triggered by the attachment representation accounts for the preemptive buffering effect is in line with other work showing that complex social psychological behaviors and states reflect the operation of basic affective processes. For example, work in developmental psychology assumes that individual differences in fearfulness, a basic dimension of temperament, contributes to the development of conscience. Likewise, work on racial bias and discrimination is showing that the roots of prejudice may lie in basic sensitivity to low level associations. The present findings are consistent with this work, showing that complex social phenomenon may reflect the operation of more basic general processes. Second, according to the social baseline theory (Coan et al., 2007), human beings' default state is one of social embeddedness, predisposing people to rely heavily on others' presence to regulate physiological and affective states. Thus, given the ubiquity with which we engage with others, whether in face-to-face or computer-mediated interactions, or through imagined presences and memories, it is possible that others provide us with these affective benefits more frequently than other stimuli. Additionally, given that social contact and interaction is the baseline for the human brain, I speculate that these affective responses may be less likely to be affected by habituation. That is, whereas repeatedly viewing a photograph of a positive object may lessen the ability of the image to buffer, viewing a photograph of an attachment figure may maintain its regulatory potency. Future research should

explore whether the positivity elicited by the imagined presence of close others is protected against the hedonic adaption that plagues many other positivity-eliciting stimuli.

### **Concluding Statement**

To my knowledge, the present research shows for the first time the ability of mental representations of attachment figures to preemptively buffer against the negative affect elicited by recalling a negative autobiographical memory. Moreover, this buffering effect operated via positivity elicited from exposure to the attachment figure primes. This form of social regulation reflects a less effortful, more automatic route to affect regulation as compared to traditional approaches that assume emotion regulation is a solo and deliberate act. The findings reported here support the notion that bringing the photograph of a loved one when deployed with the army could indeed buffer against the negative affect associated with the turmoil of war.

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## **CHAPTER V. General Discussion**

People spend significant amounts of time and money attempting to create the best possible version of their lives. Often times, people assume that improving the objective circumstances of their life will provide affective benefits. For example, they believe that having a bigger house and more expensive car or having more flexible working hours will make them happy, and therefore take steps to reach these desired goals. Indeed, well-being can be influenced by objective life circumstances, but it is can also be largely determined by the content of people's internal, unobservable thoughts (Armenta, Ruberton, & Lyubomirsky, 2015; Diener, 1994, 2000; Diener et al., 1999; Lyubomirsky, 2000). This notion is supported by research on mental time travel, which demonstrates that an individual's current affective state can be directly influenced by both past and future-oriented thoughts, independent of the object features of an individual's immediate environment (Lowenstein & Lerner, 2003; Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). Specifically, negative past and future-oriented thoughts elicit affective reactions in the present, which are experienced to the same degree as if they had been elicited directly from the immediate environment (Bower, 1981; Damasio et al., 2000; Richard, van der Pligt, & de Vries, 1996; Zeelenberg, 1999). The present work demonstrated the features giving rise to busyness and how busyness can influence well-being. Moreover, this work assessed how the negative affective consequences of busyness can be regulated through cognitive manipulation techniques and how the negative consequences resulting from upsetting memories can be attenuated via social regulation techniques.

### **Summary of present work**

The first set of studies focused on the common but understudied topic of busyness. The work identified the features people commonly use to construe busyness and the affective

consequences associated with these features. For example, the findings from Chapter II demonstrated that feelings of time scarcity (i.e., feeling like you will not have enough time next week to do the things you have to do) can have important consequences for mood and life satisfaction. More specifically, the work demonstrated that an individual's subjective feelings of busyness (i.e., feelings of time scarcity and perceptions of work-life balance) have important effects on well-being (i.e., mood and life satisfaction) above and beyond the effects of objective time use (i.e., number of hours worked and objective work-life balance). This work demonstrated that this relationship occurs both in lab settings (Studies 2, 3, & 6) and in real-world environments (Studies 4 and 5) and does not depend on an individual's dispositional characteristics (e.g., extraversion and neuroticism), demographic factors (i.e., age, gender, income, geographical location, or environmental setting), or the features of their immediate environment. The last study provided causal evidence that feelings of time scarcity decrease well-being.

The second set of studies investigated whether people are capable on identifying positive features busyness and whether people can construe busyness in terms of these positive features if explicitly directed to do so. The results revealed four different features, the validity of which were supported by past research. A second aim was to assess whether construing busyness in terms of these positive features can regulate negative affect and even provide affective benefits. The results demonstrated that individuals are able to attenuate the negative affective consequences of busyness by construing it in terms of its positive features (e.g., productivity) as opposed to its negative features (e.g., feelings of time scarcity). Importantly, this technique enabled individuals to regulate current feelings of negative affect without changing the objective circumstances of the situation.

The third set of studies investigated whether close others can help an individual to regulate the negative affective sting elicited from negative autobiographical memories. This work

demonstrated that a simple reminder of an attachment figure (e.g., via exposure to their photograph) can preemptively buffer against the negative affect resulting from an upsetting memory recall. Additionally, the studies revealed that positivity elicited by exposure to the attachment figure primes was sufficient to produce the buffering effect. This finding is important since past work has often attributed the regulatory benefits provided by attachment figures to specific attachment-related feelings (i.e., comfort and support).

Collectively, the present work demonstrates situations in which past and future-oriented thoughts can have negative affective consequences in the present. In terms of future-oriented thoughts, the present work demonstrated that busyness-related projections can decrease well-being (Chapter II). However, these negative affective consequences can be regulated by construing busyness in terms of its positive features (e.g., productivity) as opposed to its negative features (e.g., feelings of time scarcity) (Chapter III). Similarly, this work demonstrated how the negative affective consequences of upsetting memories can be preemptively regulated by the imagined presence of attachment figures (Chapter IV).

## **Conclusions**

Well-being is not only affected by objective features of the immediate environment, but also by subjective responses to past and future-oriented thoughts. The work presented here identified the features people use to construe busyness and how thinking about tasks in terms of their future time demands can negatively affect an individual's well-being. Importantly, this work demonstrates how a cognitive emotion regulation technique (i.e., cognitive reappraisal) can attenuate the negative affective consequences associated with feelings of time scarcity by focusing on the positive features of the situation (i.e., the resulting increase in productivity). The present work also demonstrates a novel form of social regulation in which the imagined presence of an

attachment figure can preemptive buffer against the negative affect elicited by an upsetting autobiographical memory. Together, these findings suggest that the negative affective consequences associated with temporally distant events can be regulated by engaging in either individual cognitive regulation techniques or social regulation techniques that do not require changes to the objective features of the immediate environment.

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