PROCRASTINATION, HEALTH, AND WELL-BEING

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PREFACE

For some people, this book may come as a bit of a surprise. Whereas we might all understand a title such as "Procrastination and Productivity," how do we make sense of a book that brings together procrastination and health? The common assumption is that procrastination, that "thief of time," is a problem of poor planning, last-minute efforts, and compromised performance. We take it for granted that the needless delay of procrastination undermines our success, but is it also related to our health and well-being? The answer provided by the various contributions to this book is clearly yes. Over the past two decades, researchers have been demonstrating that procrastination is a very important issue in terms of understanding who is healthy and happy, and who is not.

In 1997, Dianne Tice and Roy Baumeister published the first empirical report that demonstrated a relation between procrastination and health in an undergraduate student sample. Many of the results were as expected. For example, in both of their studies, self-reported procrastination was correlated positively with students turning in assignments later and correlated negatively with assignment grades. In other words, procrastinators completed their work later and received significantly lower grades, revealing a cost to procrastination. Interestingly, the longitudinal design of their second study revealed that in the short term, students who reported *higher* levels of procrastination faired *better* than their peers who reported lower levels of procrastination. In the early part of the semester, procrastination scores were *negatively* correlated with stress and physical symptom reports. However, this trend reversed over time. Later in the semester, procrastination was *positively* correlated with stress and physical symptom reports. In addition, students who reported more procrastination also reported significantly more visits to health-care professionals. Finally, by summing their data across the semester, Tice and Baumeister demonstrated that the overall cumulative effect of procrastination on stress and health was negative. Although early in the semester students who procrastinated seemed to benefit, this was only true when the deadline was remote; the overall net effect of procrastination was poorer academic performance, higher stress, and more illness.

I remember not only reading this article at the time of its publication, but also the flurry of media calls asking me about this study and what I thought it meant. Of course, I was pleased to be able to comment on this research, because it provided empirical support for something that both counselors and researchers understood all too well. Procrastination has its costs, and these costs include increased stress, poorer well-being, and negative effects on health. This seemed obvious to anyone who worked with people who procrastinated, but there had been no empirical studies to provide evidence of these clinical reports or anecdotes relating procrastination to illness. Moreover, their work helped categorize the "short-term gain, long-term costs" of procrastination as another form of self-defeating behavior that is a hallmark of poor self-regulation; a pattern that Baumeister and his colleagues have studied in terms of alcohol and drug abuse, overeating, compulsive shopping, violence, and other impulsive acts (Baumeister, Heatherton & Tice, 1994).

Of course, Tice and Baumeister's study was correlational in nature, so conclusive causal inferences were not possible. Despite this limitation, they did conclude that, "The possibility that procrastination causes stress that in turn causes illness is perhaps the most plausible account of our findings…" (Tice and Baumeister, 1997, p. 457). This indeed did seem a plausible account of their findings, but yet not the whole story, and Tice and Baumeister did *not* test this hypothesis. The need to test this hypothesis and the notion that it may not be stress alone that related procrastination to illness was the starting point for a whole program of research by my colleague Fuschia Sirois, the coeditor of this volume.

Fuschia was completing her doctoral research in health psychology when she read this paper by Tice and Baumeister. Although she agreed that the procrastination-illness relation may well be mediated by stress, she recognized that the psychophysiological reaction pattern due to stress is not the only possible route to illness. Health behaviors such as exercise, eating a balanced diet, and getting adequate sleep had also been identified in personality-health models as important causal factors in the relation between personality and health (Friedman, 2000; Suls & Rittenhouse, 1990 as cited in Sirois, Melia Gordon & Pychyl, 2003). Fuschia hypothesized that the *indirect* pathways of health behaviors may be just as important in terms of understanding the deleterious effects of procrastination on health as the direct effects of stress hypothesized by Tice and Baumeister. Moreover, she saw the need to lay out a theoretical foundation to better explain why and how stress may explain these links. Fuschia developed a meditational model

of the hypothesized procrastination-health relationship that included stress, wellness behaviors, and treatment delay as potential mediators. As you will read in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective, she used both longitudinal and cross-sectional designs in both student and community samples to test her model, and this began her intense focus on the role of procrastination in health. This program of research was ultimately the impetus for this book, but that gets me a little ahead of my story.

Shortly after completing this first study on the procrastination-health model, Fuschia defended her doctoral work on a measure of health locus of control (Sirois, 2003), and took a faculty position at Windsor University. At Windsor, she secured a grant from the Social Science and Humanities Research Council of Canada (SSHRC), which funded a series of studies examining procrastination and health under the title *How is procrastination bad for your health? Situational and dispositional perspectives on the role of stress and heath behaviors*. This research, combined with other health-related studies, quickly earned her national recognition; she was named a Canada Research Chair in Health and Well-Being, and moved to Bishop's University (Sherbrooke, Quebec) to head the Psychological Health and Well-Being Research cluster.

It was during this time at Bishop's University that Fuschia hosted the Eighth Biennial Procrastination Research Conference with the theme—*Health, Well-Being and Performance*. Colleagues from as far away as Peru joined together to discuss their research. It was an eclectic group including philosophers who helped the psychologists in attendance think more critically about basic assumptions like our notion of time. By the end of the conference, a core group of these scholars agreed to contribute to this book. Together, we address topics as varied as the deleterious effects of bedtime procrastination, the shame experienced as a social consequence of procrastination, the lack of continuity we experience between the present self and the future self, as well as the role of emotion regulation in the self-regulation failure we commonly call procrastination.

Fuschia and I have organized the papers from this diverse group of contributors into three broad sections. In Part 1, we grouped three chapters to provide a conceptual foundation to the book, and we move from there in Parts 2 and 3 to examine the relations of procrastination with health and well-being, respectively. The remainder of the Preface is a road map of sorts with a brief summary of the chapters as they are presented in the three sections of the book.

Fuschia Sirois (Sheffield University) opens the book with an explanation of how we might conceptualize the relations of procrastination with health and well-being. In Chapter 1, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being, she begins by outlining two different traditions that have been used by researchers for understanding well-being—the hedonic and eudemonic perspectives. She provides a brief review of existing research summarizing how procrastination has been shown to be related to these components of well-being. She then focuses on how procrastination and physical health have been conceptualized in the research literature, explaining how theory and research have evolved over the past few decades. As you will read, Sirois explains stress in the context of physical health because stress has ramifications for physical health and other health-related outcomes, acute and chronic. This chapter is an essential read in terms of the chapters that follow, as it provides an overall framework for thinking about procrastination, health, and well-being.

The second and third chapters that comprise Part 1 of the book are contributions from philosophers in Canada and The Netherlands. Each is particularly provocative in terms of thinking through tacit assumptions we have about procrastination and in challenging the rationalizations that are inherent to procrastination.

In Chapter 2, Recovering *Kairos:* Toward a Heideggerian Analysis of Procrastination, James Crooks (Bishop's University, Sherbrooke, Quebec) invites us to rethink time. He argues that the traditional Aristotelian concept of an abstract temporality (*chronos*) accommodates the rationalizations of the procrastinator who wants to believe that tomorrow will be just as good as this moment for tackling the task at hand. Interestingly, his discussion of the Aristotelian categories of the "no longer," the "not yet," and the "now" foreshadow analysis of our problematic treatment of the future self in later chapters (see Chapter 10, Temporal Views of Procrastination, Health, and Well-Being). However, his phenomenological account of procrastination steps away from these abstract temporal categories, situating the genuine nature of time in *kairos*, the "right moment," the point of crisis or opportunity. The philosophical foundation of this account Crooks finds in Heidegger's articulation of an authentic existential temporality, of a "moment of vision," in the second division of *Being and Time*. Following Heidegger's analysis, he is able to uncover a kind of "shell game" in procrastination—in the course of which we convince ourselves that times are uniform and interchangeable, that an unspecified future moment will be as appropriate for a proposed course of action as the present moment. Social scientists and clinicians may

not see immediately the practical relevance of this more basic philosophical analysis. Accordingly, Crooks's closing section underscores its potential therapeutic implications. He argues both that researchers and clinicians stand to benefit from clarifying the concept of time and that their clients, working through that clarification with them, may take an important step toward assuming responsibility for their lives—toward welcoming every moment as the "right moment" for honest engagement.

The focus on conceptual and philosophical issues continues in Chapter 3, Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay with the notion of "structured *non*-procrastination." Joel Anderson (Utrecht University, The Netherlands) does what no other writer in the area has done to my knowledge. He defines procrastination succinctly in three words as "culpably unwarranted delay." It is a provocative notion as he draws on the *mens rea* ("guilty mind") character of procrastination, explaining that procrastination is a particular form of delay in which individuals *themselves* have the sense that there is insufficient warrant for their delaying a task, recognizing that no circumstances excuse them. For anyone who procrastinates, this will be an unsettlingly read, as Anderson clearly acknowledges the self-defeating irrationality of procrastination, as well as the self-serving reconstruals of unwarranted delay that serve to justify or excuse procrastination. In fact, Anderson argues that a key determinant of whether someone procrastinates will be whether they succumb to the temptation to self-indulgently reconstrue their unwarranted delay as either justified or excused, and he goes on to explain how self-licensing and neutralization techniques are part of the etiology of procrastination, as self-indulgent attempts to protect one's positive self-appraisal by reconstruing one's delay as unproblematic. Given that this reconstrual process is an internal battle of sorts, one for which willpower may not suffice, Anderson draws on his previous work on "extended will" (Heath & Anderson, 2010) to set out potential strategies that serve to create structures that counteract one's attempts at self-licensing, attempts to engage in self-indulgent reconstruals of one's procrastination. This is a very practical contribution of the chapter, as Anderson concludes by providing examples of how structures might scaffold our attention, motivation, and judgment in order to self-regulate more effectively by resisting the temptation to remove something that itself inhibits procrastination, namely, the awareness that what one is contemplating is indeed procrastination (unwarranted delay). Of course, the implications for health and well-being, while not the focus of the chapter, are apparent, and Anderson offers some examples of how

structured nonprocrastination may increase the likelihood that we exercise as intended.

Having established a strong theoretical and conceptual foundation in Part 1, the second section of the book has a specific focus on research that relates procrastination with health. Part 2 opens with a chapter by Fuschia Sirois, who extends the discussion she began in Chapter 1, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being with a consideration of the contributions of procrastination and stress to *chronic* health conditions. Given that the pioneering research by Tice and Baumeister as well as the early development of the procrastination-health model by Sirois were based on symptom reports for acute illnesses, it is of interest to explore how procrastination may play a role in long-term conditions. Sirois presents a temporal extension of her procrastination-health model to explain how procrastination may create vulnerability for chronic illness. She introduces a new concept, *temporal myopia*, that captures the short-term temporal bias inherent to procrastination, and she then reviews research evidence that suggests how this temporal bias not only predicts later illness but can further compromise healthy adjustment and disease management for people already living with chronic disease. Finally, given how new this area of research is, Sirois concludes with thoughts on directions for future research that may further our understanding of the role of procrastination in both acute and chronic health problems.

Among the many behaviors that are important to our health, sleep is a too often overlooked physical requirement. Whereas more exercise and a healthier diet are tip of the tongue when we are asked about our intentions for a healthier lifestyle, it is less common for people to identify sleep as a priority (Nauts, Kroese, de Ridder, & Anderson, 2014). In addition, even those who recognize their need for sleep may still find that they do not get enough, a problem that is due at least in part to bedtime procrastination argue the authors of Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency. In this chapter, a team of researchers from Utrecht University (The Netherlands) explains that in addition to those who are *unable* to go to sleep (e.g., sleep disorder, environmental factors), many people fail to get sufficient sleep because they simply do not put themselves in a position to fall asleep. Floor Kroese and her colleagues adopt a behavioral perspective on bedtime procrastination, situating the problem as an issue of self-regulation where people fail to regulate their behavior to go to bed as intended, despite expecting to be worse off for this delay. They argue that conceptualizing sleep insufficiency this way parallels how we

think about other health behaviors such as exercise and diet, and as such it provides a framework for better understanding the underlying mechanisms of as well as potential solutions for sleep insufficiency. Given that sufficient sleep is a fundamental aspect of health and well-being, this chapter provides readers with a new and important perspective on how procrastination, and bedtime procrastination specifically, can affect us. The authors do a thorough job of linking their conceptualization of bedtime procrastination to existing research on procrastination in terms of construct definition, underlying self-regulatory processes, and potential routes for intervention.

Chapter 6, Measurement of Health-Related Procrastination: Development and Validation of the Exercise and Healthy Diet Procrastination Scales offers a psychometric perspective on the topic of procrastination and health. As Mohsen Haghbin explains, despite the clear relation of procrastination and negative health outcomes as documented in the chapters thus far, there is no validated self-report measure of health-related procrastination. Haghbin filled this gap in the literature with the development of the Health-Related Procrastination Measure—a psychometric framework for measuring procrastination on health-related behaviors specifically. In this chapter, Haghbin and Pychyl (Carleton University, Ottawa) summarize the development of two specific scales that follow this model: the Exercise Procrastination Scale that operationalizes needless delay on intended exercise, as well as the Healthy Diet Procrastination Scale. Readers will learn best practices in scale development from Haghbin's work, and both researchers and clinicians may find the resulting scales useful in their research and practice, respectively.

The final chapter for Part 2 is a reflection of the international contributions to the conference that gave rise to this book project. In Chapter 7, The Relation Between General Procrastination and Health Behaviors: What Can We Learn from Greek Students?, Maria Argiropoulou, Anastasia Sofianopoulou, and Anastasia Kalantzi-Azizi of the National and Kapodistrian University of Athens (Greece), answer the question, "What can we learn about the relation between procrastination and health-behaviors from Greek students?" What is most interesting about their perspective and analyses is their focus on students as "emerging adults." This developmental perspective provides an important contextual backdrop to understanding the life tasks and stresses that students face. Their central argument is that university life is linked to important lifestyle changes and challenges that can affect students' psychological balance and that this is further complicated by procrastination. They provide a succinct discussion of their theoretical perspective on students' lives and the notion of psychological balance followed

by a summary of a recent study they conducted that revealed the complex pattern of associations between procrastination and students' health behaviors, as well as perceived barriers to and attitudes toward adopting a healthier lifestyle. Of interest is their concluding section where they discuss the possible policy implications of this approach in addressing students' health and well-being. Their recommendations around teaching students more constructive emotion-focused coping strategies provide a natural transition to the first chapter of the final section of the book.

Part 3 of the book consists of chapters that focus more on understanding the relation of procrastination and well-being. We begin with a chapter by the coeditors, Pychyl and Sirois, who situate procrastination within the larger framework of emotion regulation. To this point in the book, most authors have clearly identified procrastination as a self-regulation failure, many have addressed the short-term mood repair that procrastination provides, and a few authors have specifically noted that procrastination is a form of coping. In Chapter 8, Procrastination, Emotion Regulation, and Well-Being, Pychyl and Sirois argue that procrastination is best understood as an emotion-focused coping strategy that serves an emotion-regulation function. Given this, they argue that it is important to discuss procrastination in relation to what we know about emotion regulation more generally. The chapter begins with a summary of research conducted by Tice, Bratslavsky, and Baumeister (2001) who experimentally demonstrated how people use procrastination to provide short-term mood repair. Having established this basic premise about the function of procrastination in emotion regulation, the authors then explain how this mood repair can be understood in terms of the process model of emotion regulation (Gross, 2014) as well as *functionally* and *temporally* as a strategy to satisfy hedonic needs (Koole, 2009). Taken together, these high-level perspectives serve to explain the phenomenon of procrastination and point to possible avenues for future research that will help us understand how and why procrastination affects our health and well-being.

Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination provides a unique and much needed social-psychological perspective on procrastination and well-being. Benjamin Giguère and Matma Vaswan (University of Guelph, Ontario) along with coeditor Fuschia Sirois (Sheffield University) explain how procrastination as a self-regulatory failure is also a transgression of sociocultural norms; procrastination signals to others potential problems with the person's ability to engage in self-control. This social response to the individual's

procrastination gives rise to shame along with the well-documented negative effects on health and well-being. What is particularly important about this social perspective on procrastination is that it moves away from the dominant individual difference approach of most of the existing research and instead portrays procrastination as a collective problem based on the violation of social norms. The authors offer empirical support for their approach demonstrating in their research that participants reported the greatest experience of norm transgression when they perceived that they were avoiding a high-effort task in favor of a low-effort alternative. This discrepancy between the effort demands of a delayed task and those of an alternate task results in the experience of shame and being concerned about being negatively evaluated by others. Interestingly, the chapter concludes with the authors speculating on future research to explore how a drop in positive social cues and pride due to procrastination might motivate future restorative behavior such as more timely goal pursuit in an attempt to re-establish social trust, reduce shame, and increase positive emotions about self such as pride.

The next chapter in the book could have found a home in Part 1 as well, because it provides an important conceptual piece to the procrastination puzzle. In Chapter 10, Temporal Views of Procrastination, Health, and Well-Being, Eve-Marie Hudon-Blouin (Carleton University, Ottawa) focuses on one of the paradoxical aspects of procrastination. That is, although procrastination benefits the present self in terms of short-term mood repair, the future self pays a price, as the avoided task is assigned to the future self who may now face additional time pressure or even time urgency. Together with the coeditors, Hudon-Blouin explains why and how procrastinators disconnect from the future self and highlight the negative consequences of this disconnection for health and well-being. She presents empirical support on how vivid mental imagery can operate alongside positive affective states to foster and sustain the temporally extended self, and she reviews how feeling more connected to the future self can have important benefits for health and well-being.

Given the social consequences of procrastination highlighted in Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination as well as the performance effects noted generally in the research literature, it is not surprising to learn that there is an interest in understanding the relation between procrastination and well-being in the workplace. This is the focus of Chapter 11, Procrastination and Well-Being at Work by Wendelien van Eerde (Amsterdam Business School, University

of Amsterdam). Van Eerde faced a difficult task addressing this issue, because there is little available research about procrastination in the workplace specifically. In order to speak to the issue, she had to summarize research related to topics such as counterproductive work behavior and withdrawal, and relate these to the existing procrastination research literature; something she did ably having previously authored one of two meta-analyses on procrastination. In addition to this summary of related topics, van Eerde presents a conceptual model of workplace procrastination that integrates both the characteristics of the person and of the work context, arguing that both are equally important to the occurrence of procrastination and its effects on well-being at work. This conceptual model provides a framework for her review and suggestions for future research to address the relative lack of work done to date.

The final chapter of the book, as might be expected, looks ahead to what research is needed to address gaps in the literature and to further explore promising areas of interest, many of which have been discussed in this book. In Chapter 12, Future of Research on Procrastination, Health, and Well-Being: Key Themes and Recommendations, the coeditors, Sirois and Pychyl, begin by highlighting the important difference in the literature between conceptualizing procrastination as a trait versus a state, or what has been referred to as situational procrastination. These differences are important in understanding the relation of procrastination, health, and well-being as Sirois explained in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective, and yet this dichotomy is even called into question when we construe procrastination as a coping strategy. Future research and theory development should consider these distinctions more carefully. For example, as opposed to conceptualizing procrastination as a trait or state, it may be more useful and parsimonious to think of procrastination as an individual's characteristic adaptation following the Five-Factor Theory developed by McCrae and Costa (2008). From this theoretical perspective, procrastination clearly sits at the intersection of the major traits and situational influences as discussed by van Eerde in Chapter 11, Procrastination and Well-Being at Work, and conceptually it shares a theoretical home with other related concepts such as goals and coping strategies. Following some discussion of the need for this basic theoretical work, Sirois and Pychyl turn to three other major themes: measurement, research methods, and intervention. In sum, they argue that future research needs to continue to develop the kind of construct validity argument that is represented by Haghbin's work (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being), and

expand research methods beyond the far too typical cross-sectional designs using self-report measures. Given the temporal nature of both procrastination and health, it is very important that longitudinal research in the community, perhaps using experience-sampling methods, be conducted. Finally, as each author has stressed in the concluding sections of their chapters, we need to ground intervention approaches in the kind of research highlighted in this book. Not surprisingly, this may be an eclectic approach representing everything from an existential-humanist approach advocated by Crooks (see Chapter 2, Recovering *Kairos:* Toward a Heideggerian Analysis of Procrastination) through to public health interventions delivered both at the level of primary care and at the population level as suggested by Sirois (see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective) and Argiropoulou et al. (see Chapter 7, The Relation Between General Procrastination and Health Behaviors: What Can We Learn from Greek Students?). In conjunction with traditionally endorsed methods such as cognitive behavioral therapies (Dryden, Neenan & Yankura, 1999) and emerging techniques such as acceptance and commitment therapy (Glick & Orsillo, 2015; Scent & Boes, 2014), these interventions may become an essential focus for anyone interested in improving health and well-being outcomes.

Taken together, the chapters of this book provide a timely and important contribution to our understanding of how procrastination affects our health and well-being. It has been a pleasure to work with the various contributing authors as we edited this volume. We hope you find the chapters informative and that each may stimulate new research and perhaps a new generation of researchers interested in addressing health and well-being through a better understanding of the human propensity for procrastination.

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CHAPTER 1

Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being

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Nothing [is] so fatiguing as the eternal hanging on of an uncompleted task.

–William James

Our understanding of the causes and consequences of procrastination has burgeoned over the past three decades, as researchers have turned their attention to some of the likely but not always expected outcomes of needlessly delaying important and necessary tasks. In many ways James's reflection captures the essence of the potential psychological and physical toll of procrastination that much of this research has addressed. Knowing that a task is there waiting to be completed, but not being able to bring yourself to complete it can be draining psychologically. Early research has demonstrated that these incomplete tasks are difficult to forget, are more concretely remembered, and accordingly consume more energy (Zeigarnik, 1927). If we also consider the feelings of guilt and shame that arise from the admonition of procrastination (Fee & Tangney, 2000; see Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination), and the accompanying negative self-evaluations from acknowledging that this delay is needless (Flett, Stainton, Hewitt, Sherry, & Lay, 2012; McCown, Blake, & Keiser, 2012), it becomes clear that procrastination can be psychologically and emotionally fatiguing, as well as very stressful.

What may be less obvious is that there are some very real and concerning physical health consequences associated with procrastination, both in the short and long term. These consequences may be further amplified if the task that is being procrastinated is directly related to managing one's physical health, such as going to the doctor for a medical diagnosis or check-ups (Samet, Freedberg, Savetsky, Sullivan, & Stein, 2001; Sirois, 2007; Sirois, Melia-Gordon, & Pychyl, 2003; Yaniv, 2002), engaging in health

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maintenance and promoting behaviors (see Chapter 6, Measurement of Health-Related Procrastination: Development and Validation of the Exercise and Healthy Diet Procrastination Scales; Sirois, 2004), or even going to bed at a reasonable hour (see Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency; Kroese, De Ridder, Evers, & Adriaanse, 2014). When procrastination becomes a characteristic way of responding to tasks which are unpleasant or aversive, or which trigger feelings of self-doubt, then procrastination may have effects that are both negative and far reaching. If we view procrastination this way, that is, as a relatively stable, trait-like tendency, it is not hard to imagine how procrastination can create vulnerabilities for poor health. Increasingly, personality is being acknowledged as an important epidemiological factor for understanding health-related trajectories and outcomes, due primarily to its links to modifiable risk factors for the development of mental and physical health issues, such as stress, diet, and physical activity (Bogg & Roberts, 2013; Hampson, Goldberg, Vogt, & Dubanoski, 2007).

In this introductory chapter of the first volume to address how procrastination relates to health and well-being, I provide a brief outline of the ways in which our understanding of the implications of procrastination for health and well-being have evolved over time. Many of the theoretical advances on this topic have emerged within the past 15 years, as researchers have proposed and tested new models specifically focusing on understanding how procrastination might relate to health. New conceptualizations of the intrapersonal emotional and cognitive processes underpinning procrastination have also contributed to a more complete understanding of the implications of procrastination for well-being. This research has moved from a more descriptive view of the associations of procrastination to negative affective states such as depression and anxiety, to a more process-focused view that attempts to explain the *why* of these associations. Nonetheless, these insights build on the early research on procrastination and its consequences, which provided a solid foundation for the developments that followed.

After outlining the two different traditions that have been most used by researchers for understanding the nature of well-being, I provide a brief review of the research to date on how procrastination may relate to each of these components of well-being and their dimensions. Next we turn to the issue of procrastination and physical health and present a brief overview of how theory and research directed at understanding the implications of procrastination for health has developed over the past decades. Although stress is arguably an indicator of poor well-being, stress can also have numerous

ramifications for physical health and other health-related outcomes both in the short and long term. For this reason, research and theory on the links between procrastination and stress are considered in the context of physical health.

PROCRASTINATION AND WELL-BEING: A TALE OF TWO TRADITIONS

Understanding how procrastination may relate to well-being depends in part on the conceptual lens we use to define well-being. Although the term "well-being" has its roots in classical Greek teachings, there are two complementary yet competing conceptualizations of well-being often referred to by modern scholars. When viewed from the hedonistic tradition, the term "well-being" is closely aligned with the ancient Greek Epicurian conceptions proposing that the ultimate goal in life is to maximize pleasure—*hedonia*—and minimize pain (Waterman, 1993, 2008). Affective states, both positive and negative, are the currency of well-being from the hedonic perspective, with higher levels of positive and lower levels of negative affect coalescing into a positive affective balance, which is indicative of greater well-being (McDowell, 2010). Modern conceptualizations aligned with this hedonic view suggest that well-being is comprised of two higher-order factors: an emotional component characterized by affective balance, and an evaluative component characterized by overall satisfaction with one's life and satisfaction with specific and important life domains such as work, personal life, and family life (Ryan & Deci, 2001). Together these two components are often referred to as *subjective well-being* (Diener, 1984; Diener, Suh, Lucas, & Smith, 1999) because they reflect the pleasant feelings and sense of satisfaction that arise from reflecting on one's accomplishments.

In contrast, the eudemonic view of well-being favors the ethics of Aristotle over those of his pleasure seeking contemporaries. Accordingly, well-being is viewed as a natural product of pursuing goals that are aligned with the authentic self or *daimon*. In his Nicomachean ethics Aristotle (1985) proposed that eudaimonia was not a subjective but an objective state that emerged from contemplating the best within oneself (Waterman, 2008). Modern conceptualizations of well-being founded on this view focus not only on the contemplations of authenticity and personal excellence, but also on the actions taken toward actualizing this potential. Eudemonic theories therefore locate well-being within the process of working toward personally meaningful and relevant goals rather than within the affective end states

associated with reaching goals (Waterman, 2008). In short, well-being from the eudemonic perspective is an emergent property of engaging in pursuits that lead to personal growth and the development of one's potential Ryff (1989; Ryff & Keyes, 1995).

Although research on well-being has tended to distinguish these rival traditions, there is nonetheless considerable overlap between the two. Fulfilling one's potential may increase feelings of happiness, and being satisfied with certain areas of one's life can feed back into deeper contemplation about what it means to be authentic and which goals can further develop one's potential. Conversely, and relevant for our discussion of procrastination, not being able to realize goals and actualize one's potential is likely to lead to feelings of sadness and guilt as well as a range of other negative emotions. This conceptual overlap has led some researchers to suggest that it may be more practical to think of each type of well-being as running in tandem to each other (Biswas-Diener, Kashdan, & King, 2009; Kashdan, Biswas-Diener, & King, 2008), rather than being truly separate and distinct.

With respect to procrastination, extensive research over the past two decades has provided a wealth of insights into the correlates and consequences of procrastination for well-being. Paramount among this research is the robust links of procrastination to negative mood states such as depression and anxiety (Ferrari, 1991; Haycock, McCarthy, & Skay, 1998; Lay, Edwards, Parker, & Endler, 1989; Martin, Flett, Hewitt, Krames, & Szanto, 1996; Senecal, Koestner, & Vallerand, 1995), distress (Flett et al., 2012; Rice, Richardson, & Clark, 2012), shame and guilt (Blunt & Pychyl, 2005; Fee & Tangney, 2000; see Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination; Ferrari, 1994), and poor overall mental health (Stead, Shanahan, & Neufeld, 2010). When measured as a relatively stable tendency or trait, procrastination can arguably be viewed as preceding these negative affective states. However, there is also evidence that these negative states can precede and contribute to procrastination when it is a situationally bound occurrence. For example, negative mood states are known to predict procrastination (e.g., Ferrari, 1994; Tice et al., 2001), and the feelings of shame, guilt, distress, and anxiety associated with a task that has been needlessly delayed can promote further task disengagement and avoidance as a means to regulate these negative emotional states (e.g., Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination; Lay, 1994; Milgram, Gehrman, & Keinan, 1992). What becomes clear from this research is that the relationship between

procrastination and negative mood states is complex and reciprocal, with cyclical amplification of both procrastination and negative affect a likely outcome of their dynamic interrelations.

In terms of understanding *why* and *how* procrastination is linked to negative mood states, much of the early writings on procrastination focused on fear of failure and fear of success as potential explanations for both procrastination and the negative states that preceded and followed procrastination (Burka & Yuen, 1983; Ellis & Knaus, 1977; Rorer, 1983). More recently researchers have turned their attention to understanding the intrapersonal and cognitive processes involved in procrastination that may contribute to the generation and maintenance of the negative affective states so common among frequent procrastinators. For example, procrastinatory cognitions have been identified as a particular set of automatic, ruminative thoughts that underlie the negative mood associated with procrastination (Flett, Haghbin, & Pychyl, in press; Flett et al., 2012; Stainton, Lay, & Flett, 2000). Characterized by brooding and self-blame over past incidences of procrastination, these thoughts can arise when there is difficulty completing a challenging or aversive task that may prompt procrastination (Stainton et al., 2000). Both cross-sectional and longitudinal studies have demonstrated that such thoughts are linked to negative mood states and distress (Flett et al., 2012, in press; Stainton et al., 2000).

A key component of these procrastinatory cognitions is a negative evaluation and admonition of the self. Self-criticism, self-blame, self-judgment, and other negative and punitive thoughts directed at the self appear to be one central way in which procrastinators unwittingly maintain the negative mood that perpetuates their cycle of procrastination and contributes to their poor well-being. Although this notion of procrastinators being their own worst enemy appears to be illogical, Burka and Yuen (1983) have aptly suggested that such negative evaluations may be viewed as the lesser of two evils by procrastinators:

> *As painful as it is to judge yourself for procrastination, self-criticism may be easier to tolerate than the feelings of vulnerability and exposure that come with trying your best and then landing in the territory of your own fears. (p. 16)*

Evidence over the past 20 years provides some support for this insight by demonstrating that procrastination, when assessed as a relatively stable tendency, is consistently associated self-blame (Sirois, 2015; Sirois & Kitner, 2015; Sirois & Stout, 2011), self-criticism and self-judgmental thoughts (Sirois, 2014b; Sirois & Tosti, 2012), self-depreciation (McCown

et al., 2012), and negative self-evaluations more generally (Flett, Blankstein, & Martin, 1995). Importantly for our discussion of well-being, a number of these studies have also found that negative self-evaluations explain the higher levels of negative affective states experienced by procrastinators (Sirois, 2014b, 2015; Sirois & Kitner, 2015; Sirois & Tosti, 2012).

More fundamentally, recent theory and research argues that an inability to regulate negative emotions in a healthy and nonself-defeating way is key for understanding procrastination (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being; Sirois & Pychyl, 2013; Tice & Bratslavsky, 2000). From this perspective, the prioritization of short-term mood regulation over more instrumental action to reach goals means that not only are long-term goals forfeited, but also that temporary quick fixes to repair negative mood may serve to maintain negative states because the underlying sources of these states (e.g., feelings of incompetency, harshly critical self-evaluations, and rumination about procrastination) are not directly addressed. In short, poor emotion regulation is in itself an explanation for the maintenance of negative affective states and poor well-being associated with procrastination.

The temporal trade-off reflected in this mood-regulation dynamic also highlights another important aspect of procrastination that recent theory and research has begun to address (e.g., Sirois & Pychyl, 2013). Procrastination can be viewed as temporally bound behavior in which momentary affective boosts from disengaging from unpleasant or aversive tasks may improve affective well-being in the present, but at the expense of well-being in the future. The costs to future well-being, or more accurately the well-being of the future self, are not just with respect to hedonic well-being because the negative mood associated with procrastination is not effectively regulated (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being). In short, when we procrastinate, the present self does not anticipate the emotional consequences to the future self (Sirois & Pychyl, 2013; Tappolet, 2010). There are also costs for eudemonic well-being because opportunities for personal growth and self-discovery through engaging with important goals may be lost, and because this trade-off reinforces a temporal disjunction with the future self that can erode self-continuity (see Chapter 10, Temporal Views of Procrastination, Health, and Well-Being).

In contrast to the research on negative affect, there is much less research on how procrastination relates to other aspects of hedonic well-being. For example, in a recent meta-analysis of procrastination and time perspective, procrastination was associated with lower levels of positive affect across two

samples (Sirois, 2014a). Taking a latent variable approach, Balkis and Duru (2015) demonstrated that procrastination predicts lower levels of positive affect among university students. Finally, in one longitudinal study of adults trying to make intended health behavior changes, trait procrastination was linked to lower levels of positive affect about making the healthy changes, which in turn predicted being less likely to succeed in following through these healthy changes (Sirois & Giguère, 2013).

Life satisfaction is another aspect of hedonic well-being that has received less attention, but is increasingly becoming a focus for research on procrastination and well-being. Given the high reported rates of procrastination among college and university students (Steel, 2007), it is not surprising that researchers have turned their attention to the links between procrastination and satisfaction in this population. These investigations converge with the research linking procrastination to other dimensions of hedonic well-being by finding that in general student procrastinators report experiencing lower life satisfaction (Çapan, 2010; Özer & Saçkes, 2011) and lower academic life satisfaction (Balkis & Duru, 2015). Work life is another domain where the implications of procrastination for well-being have been investigated (see Chapter 11, Procrastination and Well-Being at Work). Although limited, this emerging research has noted that procrastination is associated with lower job satisfaction (Mohsin & Ayub, 2014;Van Eerde & Sirois, 2015). However, in both contexts the reasons for lower satisfaction have not been fully explored.

One conspicuous gap in the research on procrastination and well-being is the relative dearth of research on how procrastination may relate to eudemonic conceptualization of well-being. Two notable exceptions are from research conducted by Blunt & Pychyl (2000, 2005), which used personal projects analysis (PPA; Little, 1983) to understand the qualities of the projects associated with procrastination across their different stages of action (inception, planning, action, and termination). PPA involves rating ongoing projects across multiple dimensions including how well the project reflects qualities related to authenticity such as personal meaning, autonomy, and self and identity. Not surprisingly, projects rated as being low on personal meaning and autonomy were associated with task aversiveness at every stage, and task aversiveness was in turn associated with procrastination of that task (Blunt & Pychyl, 2000). The results from a second study converged with these findings: the project systems of procrastinators were rated low on self and identity (Blunt & Pychyl, 2005), again suggesting that procrastination is associated with low levels of eudemonic well-being.

Further evidence for a possible link to eudemonic well-being comes from a study conducted by Haghbin, McCaffrey, and Pychyl (2012) which used self-determination theory (Deci & Ryan, 2000) as a framework to examine how fear of failure related to procrastination of everyday and academic tasks among university students. Although the pattern of results was complex with respect to the need for competency, a key finding was that fear of failure was linked to procrastination through its connections with less satisfaction of the need for autonomy, arguably a proxy for the authenticity dimension of eudemonic well-being. When taken together with the previous two studies described, this research provides supportive evidence for the notion that procrastination is associated with poor eudemonic well-being.

In summary, research on procrastination and well-being has predominantly focused on hedonic well-being, and on the links to negative affective states in particular. Much of the early research on this dimension of well-being was descriptive or proposed possible causal links without assessing these using systematic, empirical means. In recent years, researchers have answered the call to understand *why* and *how* procrastination is linked to negative mood states by taking a more theory-driven approach, and proposing and testing the cognitive and intrapersonal processes involved in procrastination that may perpetuate a cycle of negative mood and procrastination. There is, however, relatively less research on how procrastination may relate to other dimensions of hedonic well-being such as positive affect and life satisfaction, although the limited existing research suggests procrastination is negatively related to each. There is also little if any research directed at understanding *why* or *how* procrastination may reduce life satisfaction, or the nature of the dynamics linking procrastination to positive affect in both the short and long term. With respect to eudemonic well-being, there is limited but promising research that provides supportive evidence for the proposition that procrastination may take a toll on this more process-oriented view of well-being. Clearly more research is needed to help map where procrastination lies on the eudemonic landscape of well-being.

PROCRASTINATION AND PHYSICAL HEALTH: A TALE OF TWO ROUTES

The notion that procrastination may have ties to physical health outcomes may seem surprising, especially if we think of procrastination as a single, "one-off" event. Rushing around at the last minute to get important tasks

done that could have been tackled days earlier can be stressful and have some immediate and negative consequences for mood. It may also trigger a dialogue of negative self-talk that maintains this negative mood. But when this becomes a characteristic way of responding to important and intended tasks that are viewed as unpleasant, frustrating, or challenging, then the implications of procrastination for health become much clearer. Accordingly, much of the research to date focused on procrastination and health has taken this trait view of procrastination to understand both the short-term and long-term health-related consequences of this common form of self-regulation failure.

The first study to make this link between procrastination and physical health followed students from the beginning to the end the academic term. Tice and Baumeister (1997) made the interesting and somewhat unexpected observation that student procrastinators reported better health and lower stress compared to nonprocrastinators at the beginning of term. However, by the end of the term this apparent advantage had reversed, and those students who were self-reported procrastinators now reported more health problems and higher levels of stress. Perhaps what is more striking about these findings was that the sample of relatively young and healthy students might be expected to be more resistant to the toll of procrastination on health if these effects were relatively small or inconsequential. Although it seemed likely that the higher levels of stress reported by the procrastinators may be one explanation for this unexpected link, their study did not test this proposition.

This intriguing and perhaps landmark study set the stage for the development of a more systematic line of inquiry into not only whether procrastination was linked to health outcomes, but also *why* procrastination may confer risk for poor health. The procrastination-health model (Sirois et al., 2003) was proposed as a provisional blueprint for understanding the routes through which trait procrastination may confer risk for poor health as suggested by the initial study by Tice and Baumeister (1997). Grounded in models of personality and health (e.g., Friedman, 2000; Smith, 2006; Suls & Rittenhouse, 1990), which highlight the mechanisms and routes through which characteristic ways of thinking, feeling, and behaving might have implications for physical health outcomes, the procrastination-health model (Sirois et al., 2003) posited two pathways to explain why procrastination may be linked to health.

The *direct* or stress-related route suggests that procrastination creates risk for poor health-related outcomes through frequent activation of the

stress response and the stress-related psychophysiological changes that follow (Sirois et al., 2003). These can include activation of the hypothalamic-pituitary-adrenal (HPA) axis, which can negatively impact health through suppression of the immune system and thus increase vulnerability for illness. The experience of stress also involves the activation of the sympathetic nervous system, which is involved in the *fight or flight response* and as such is involved in changes in heart rate, respiration rate, blood flow to the muscles, and suppression of digestive functioning all for the purpose of mobilizing the body's resources to be in a preparatory state to respond to immediate threats (Taylor & Sirois, 2014). Despite the potential adaptive value of this cascade of psychophysiological events for dealing with urgent and physically harmful threats, when the stressor is yet another report that is overdue because it has been unnecessarily and needlessly delayed, the physical costs can add up quickly.

In contrast, the *indirect* or behavioral route posits that procrastination confers risk for poor health through its connection with poor health-related behaviors (Sirois et al., 2003). Engaging in frequent health-promoting behaviors, such as eating a healthy diet and regular physical activity and exercise, and health maintenance behaviors, such as seeking appropriate and timely care for medical issues, are important for enhancing and maintaining physical health. However, they can often be seen as difficult or challenging, in the case of health-promoting behaviors, which require changing one's routine, or anxiety-provoking conditions, in the case of medical visits that may result in unwanted news about one's current health state, or having to undergo unpleasant diagnostic tests. It is these aversive qualities that make such behaviors more likely to be those that are procrastinated especially by those who have an enduring tendency to respond this way to something unpleasant or aversive (Blunt & Pychyl, 2000). Yet failure to engage in these behaviors are known to increase risk for poor health outcomes, as they are often referred to as modifiable risk factors for the development of chronic disease (World Health Organization, 2011).

The first test of the procrastination-health model provided some support for these propositions. In a cross-sectional study of students, procrastination measured as trait was associated with higher stress, less frequent practice of health-promoting behaviors, greater delay in seeking medical care for physical symptoms, and a greater number of self-reported acute health problems such as headaches, digestive issues, and flus and colds (Sirois et al., 2003). However, in the mediation analysis directly testing the procrastination-health model pathways, only stress and treatment delay explained significant

variance in the number of health problems reported. One possible explanation offered for the null finding with respect to health-promoting behaviors was that the relative youth of the sample made them more robust to the potential negative health effects of not eating healthy or staying physically active. However, it was also suggested that the effects may be a product of the deadline-driven academic environment, which is conducive to both higher stress and more frequent procrastination.

To address these issues, a replication study was conducted, this time testing the procrastination-health model with a more representative sample of adults from the community (Sirois, 2007). This follow-up study also included several methodological and statistical upgrades to the first study, such as taking multiple measures of each of the model components, and using a more sophisticated structural equation modeling approach to simultaneously test the contributions of stress and health behaviors for explaining the link between procrastination and health. Another noteworthy change was the addition of a bidirectional pathway to the model that linked stress to health behaviors. This intermediary route was proposed in line with research indicating a potential reciprocal and negative relationship between these health-related outcomes (Cohen, Kamarck, & Mermelstein, 1983; Rod, Grønbæk, Schnohr, Prescott, & Kristensen, 2009). The results were surprisingly consistent with, and in some ways more robust than, those obtained in the original test of the procrastination-health model. When the overall model was tested, stress again explained the link between procrastination and poor health after accounting for the role of health behaviors, which was again nonsignificant. However, a test of the nested model linking procrastination to poor health via less frequent health-promoting and health maintenance behaviors without the influence of stress was also significant, providing solid support for the veracity of the indirect route proposed by the procrastination-health model.

A number of variations and extensions of the original procrastination-health model have been proposed and tested, each arriving at similar conclusions: procrastination is associated with poor health outcomes (see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective for a complete review of research with the procrastination-health model). To date, the procrastination-health model has been used as a guiding conceptual lens to examine a range of physical health outcomes including acute health problems (Sirois, 2007; Sirois et al., 2003; Sirois, Voth, & Pychyl, 2009), self-rated health (Sirois & Stout, 2011; Sirois & Tosti, 2012), sleep quality (Sirois, Van Eerde, & Argiropoulou, 2015), and

hypertension and cardiovascular disease (Sirois, 2015), in both adult and student samples.

Although physical health status may be considered the definitive health-related outcome, the routes linking procrastination to physical health—stress and health behaviors—are also important intermediary health outcomes to consider with respect to procrastination. This is a particularly important point given that their linkages with physical health are often reciprocal rather than linear. For example, apart from the negative association between stress and health behaviors noted previously (Cohen et al., 1983; Rod et al., 2009), being in a poor state of health may in itself be stressful and impede the practice of important health behaviors such as staying physically active and eating healthily. What this amounts to is that the vulnerability for poor health from chronically procrastinating could contribute to greater stress, or at a minimum less resistance to stress from being in a fatigued and depleted state. For example, experimental evidence has demonstrated that fatigue due to sleep deprivation lowers the psychological threshold for perceiving and responding to even mild stressors (Minkel et al., 2012). With respect to procrastination, there is some preliminary evidence suggesting that there may indeed be reciprocal and dynamic relations among procrastination, stress, and sleep, as higher stress explained the link between procrastination and sleep quality in one study of undergraduate students (Sirois et al., 2015).

The potential compounding effects of procrastination for health-related outcomes are perhaps best illustrated by research that has examined the role of procrastination in coping with chronic health conditions. Fatigue is a common feature of many chronic illnesses that can create additional vulnerabilities for poor functioning and responses to stress (Graff et al., 2011; Hirsch & Sirois, 2014; McNallen et al., 2013). In this context, it would therefore be expected that procrastination would relate to higher stress in part because it impairs healthy regulation of emotions via coping in response to the demands on the disease. Two studies suggest that this may be the case. In one study of people with fibromyalgia, trait procrastination was associated with less effective coping with the emotional aspects, symptoms, and daily problems of living with fibromyalgia (Beauregard et al., 2015). More compelling are the findings from a study of people with self-reported cardiovascular disease or hypertension (CVD/HT) in comparison to healthy controls. The use of avoidant coping strategies and self-blame explained the association between procrastination and stress in both the healthy control sample and the CD/HT sample (Sirois, 2015). However, the magnitude of

the association of procrastination to stress via coping was much larger in the CVD/HT sample, suggesting that procrastination created greater vulnerability for higher stress among those who were already compromised in terms of their overall energy levels.

Being in a poor or diminished state of health is also likely to make it even more difficult to engage in the very health behaviors that may restore energy and physical health for someone who routinely puts off these behaviors. Fatigue from being ill or in poor health is known to compromise self-regulation (e.g., Solberg, Ehlers, Whipple, & Vincent, 2012), an important and albeit necessary capacity for engaging in health-promoting behaviors (de Ridder & de Wit, 2008; Hall, Fong, Epp, & Elias, 2008). Indeed, in one study, procrastination was associated with weaker intentions to engage in health-promoting behaviors that participants had identified as important to maintain and improve their health (Sirois, 2004). Low health-related self-control, a construct related to self-regulation (Baumeister, Heatherton, & Tice, 1994), fully explained this association. This cycle of fatigue and ongoing self-regulation failure may be particularly problematic if the health behaviors being procrastinated involve going to bed in a timely manner. Several studies now demonstrate that the phenomena of *bedtime procrastination* (Kroese et al., 2014; see Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency) is not only more likely to be engaged in by people who chronically procrastinate in other areas of their life, but also contributes to sleep insufficiency and daytime fatigue.

In summary, research investigating the links between procrastination and health has evolved from an initial observation that procrastination may confer risk for poor health, to a series of more theory-driven, systematic investigations into why this may be the case. Stress and poor health behaviors are two key routes suggested by the procrastination-health model (Sirois, 2007; Sirois et al., 2003) to link trait procrastination to physical health, and have therefore been the focus of much research on this topic. However, each can also be viewed as an important intermediary health outcome that warrants closer examination with respect to procrastination, especially as the interrelations with physical health outcomes are likely to be reciprocal and dynamic. In this respect, fatigue from suboptimal health states is a key factor to consider as it can contribute to further stress and impair the self-regulation of health-promoting behaviors, putting chronic procrastinators at further risk for poor physical health.

CONCLUDING THOUGHTS

Research on procrastination health and well-being has continued to flourish over the past several decades. The early research in the 1970s and 1980s focused on describing the consequences of procrastination for aspects of hedonic well-being, whereas research from the late 1990s onward noted that procrastination can also have deleterious consequences for physical health. Since that time, a number of empirical and theoretical advances have paved the way for further insights into not only whether procrastination confers risk for poor health and well-being, but also *why* procrastination may be linked to vulnerability for poor health-related outcomes. Framing this research in terms of extant models of well-being provides a potentially useful map from which to navigate not only the range of different ways that procrastination can relate to well-being (e.g., negative mood states, lower life satisfaction, and reduced personal growth and feelings of authenticity), but also helps to highlight the gaps in the current research on this topic with respect to each of the two traditions of well-being. Analogous to this, the procrastination-health model addresses these issues for outcomes related to physical health by providing a provisional blueprint for understanding the two key routes that link procrastination to physical health outcomes (stress, suboptimal physical health, and infrequent health behaviors), and the potential for reciprocal, dynamic, and complex links among these outcomes.

Returning to William James's commonsense assertion that "Nothing [is] so fatiguing as the eternal hanging on of an uncompleted task," research to date confirms that procrastination can be psychologically and emotionally fatiguing. Importantly, this research also indicates that the stress from procrastinating may be fatiguing in other very real and concerning ways that can put physical health further at risk.

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CHAPTER 2

Recovering *Kairos*: Toward a Heideggerian Analysis of Procrastination

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Above all, we cannot afford not to live in the present.

– ***Thoreau (1976, p. 628)***

I am sitting at the desk in my office. It is 1:00 pm on a Tuesday. Just back from lunch, I review mentally a menu of possible tasks for the afternoon in front of me. To my right, on top of a modest stack of accumulating unopened mail, there sits a letter-sized envelope from the *Société de l'assurance automobile de Québec*. I found it in my campus mailbox about 2 weeks ago. Although I have not examined its contents, I am reasonably certain it contains the form for renewal of my driver's license. I *should* deal with it. Last year I ignored an unpaid parking ticket and wound up, eventually, bouncing between three locations in the city trying to pay it off before the fine tripled. I ponder, with that experience in mind, the vast bureaucracies of government departments imposing irritating little tasks with deadlines on millions of people every day. In the future, I think, perhaps work will consist mostly or only in the performance of such tasks. I feel mildly outraged. Is it not my responsibility to make a stand against this devolution of work? To make sure I have fed my own soul before I feed the bureaucratic dynamo? Beside the stack of unopened mail, face down on the desk so as to mark my place, is a paperback copy of Milan Kundera's *The Unbearable Lightness of Being*. I spied it on a bookshelf a while ago and, recalling the impression it made on me when I read it originally in the 1980s, decided to read it again. Getting through one or two of its chapters now strikes me as a far better "spiritual" preparation for writing the lecture notes I need to produce before day's end than dealing with the envelope from *La Société de l'assurance automobile* and other things of a similar nature lurking under it. The government can wait. I can do whatever is necessary for license renewal wherever it is necessary to do it Thursday at 1:00 pm, Friday at 1:00 pm, or even next week.

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Here, of course, I am procrastinating. It is a fascinating and surprisingly complex case of what Sirois and Pychyl (2013) call "self-regulation failure." The government's demands on me as a driver are neither excessive nor unreasonable. In any case, they must be met. Putting them off indefinitely, I risk entangling myself in a series of sanctions that will culminate in losing my license—something that would cause far more trouble and irritation than dealing promptly with renewal. I know this full well. The attempt to balance that knowledge by becoming a crusader for my own creative work is essentially a smoke screen—it is simply false to claim that one kind of activity precludes the other. I know this too. What then allows me to accept my unconvincing tale as to why I should act counter to my own interests? Above all—reviewing now carefully the little ebbs and flows of anxiety in the experience I have just described—it is the assurance that I might *just as well* deal with my license Thursday at 1:00 pm, Friday at 1:00 pm, or next week—which is to say, the idea that the time that accommodates my labor is uniform, abstract, empty, and always available—a kind of unfurnished room I can come back to at my leisure and decorate as I see fit. But that means one of the conditions for the possibility of my procrastinating, one of the dimensions of my "self-regulation failure," is constituted by the way I imagine time.

In the following reflection, I want to take a few halting steps toward a phenomenology of procrastination by exploring this theme. I begin with some remarks on the concept of time Aristotle develops in his *Physics*—the template, in my view, for the kind of rationalization I described just now. At stake there is what the ancient Greeks called *chronos*—time in the abstract, time as process or sequence. I then set in contrast to this abstraction the concept of existential or ecstatic temporality developed by Martin Heidegger (1962) in his masterwork, *Being and Time.* At stake there, notwithstanding the high modern pedigree of that work, is what those same Greeks called *kairos*—the right moment, the point of crisis or opportunity. It turns out that ecstatic or kairotic temporality, in Heidegger's view, is both necessary for and concealed in abstract chronological time. Indeed, the argument of *Being and Time* as a whole consists essentially in undoing that concealment—that is, in recovering *kairos*. But if my uninterrogated image of chronological time sanctions, at least in part, putting off renewal of my driver's license and other everyday acts of procrastination, then an exercise in recovering *kairos* as its ontological foundation might be useful for a therapeutic practice directed at ameliorating the effects of procrastination. In the third stage of my reflection, I imagine what acknowledgment of *kairos* looks

like in concrete experience, elaborating an instance of "self-regulation success" that mirrors the report of "self-regulation failure" with which I began. I then conclude, with a view to contributing explicitly to a therapeutic practice, by sketching some possible practical consequences of abiding by kairotic time.

CHRONOS IN ARISTOTLE'S PHYSICS

The question of time is as old as Western philosophy. The earliest extant fragment of pre-Socratic thinking, attributed to the Milesian Anaximander by the neo-Platonist commentator Simplicius, reads:

> *[… the original sources of existing things are also what existing things die back into] according to Necessity; for they give justice and reparation to one another for their injustice in accordance with the ordinance of Time (*Chronos*).*
>
> **– *Anaximander (2000, p. 14)***

In the developed cosmology of the *Timaeus*, Plato says, memorably:

> *… of that Eternity which abides in unity He made an eternal image, moving according to number, even that which we have named Time (*Chronos*).*
>
> **– *Plato (1989, p. 77)***

But as with so many other matters, time is accorded a treatment we would recognize as properly scientific first in the work of Aristotle—specifically, his *Physics*, Book IV, Chapters 10–14 (Aristotle, 1952). There, *chronos* is represented as a natural phenomenon—a kind of thing we meet with in the world around us in roughly the same way we meet with change, motion, and place. Virtually everything Aristotle says about this phenomenon is relevant to grasping the procrastinator's rationalization. But I want to draw attention to three points in particular.

First, taking time objectively brings us straight away to the question of its existence. The parts of any duration we choose to examine are the "no longer," the "not yet," or some combination of the two. But in an important sense, neither of these things *are*. The "no longer" has receded into the past. The "not yet" is hidden in the future. "How," Aristotle asks reasonably, "can we conceive of that which is composed of non-existents sharing in existence in any way?" (Aristotle, 1952, p. 373). The temptation to solve this riddle by presenting the "now" as the part of time that is incontestably present is at least initially problematic. In strictly objective terms, it constitutes a dimensionless division of the past from the future—like a point that divides the segments of a line. Just as no line is comprised of dimensionless points,

no duration may be comprised of "nows." Qua dimensionless, it cannot be a part of time at all.

This dialectic is oddly compelling. Augustine, for example, trying, like Plato, to sort out the logic of creation, comes back to it in Book XI of his *Confessions*, taking over the terms of Aristotle's argument almost verbatim (Augustine, 1993). While immediate experience offers continuous and compelling testimony of our being in time, theoretical analysis runs up against a phenomenon the existence of which is at best "equivocal and obscure" (Aristotle, 1952, p. 373), at worst utterly chimerical. Here, coming back now more concretely to the suggestion I previously made, we encounter something like a basic condition for the possibility of procrastinating. The relief I feel when I tell myself I might *just as well* deal with the renewal of my driver's license Thursday at 1:00 pm, Friday at 1:00 pm, or even next week requires at a minimum my having separated myself from time in order to evaluate my proposed course of action. I do not objectify its parts, as Aristotle did, for purposes of scientific investigation. I am just trying to plan my afternoon. But, standing back from Thursday at 1:00 pm, Friday at 1:00 pm, or next week, evaluating these "not yets" in the service of that plan, I make them subject to the dialectic specified in the *Physics*. I can hold my future responsibilities at a distance, at least in part, because, qua object, the future will feel or seem to me somehow unreal.

However—and this would be the second point—the abstract, empty appearance of *chronos* is not simply a function of the attitude I take evaluating it. As Aristotle develops his theme, as he presses through the dialectic involved in thinking or knowing the "no longer" and the "not yet," he uncovers a kind of abstraction in the phenomena themselves. The nature of this abstraction emerges in analysis of the relation between time and movement (*kinesis*). It is clear that these things are intimately related. We cannot imagine the former at all in the absence of the latter. By the same token, however, it is clear that they are not identical. To say that our conception of time *requires* movement is to recognize that movement is presupposed in it. What exactly, Aristotle asks, is the sense of that presupposition?

Movement is a kind of change (*metaboles*) that requires—that unfolds or *is* over against—magnitude (*megethos*). Inasmuch as a given thing *x* moves, it travels the distance between two points *a* and *b*, between some "here" and some "there." The "between" itself, moreover, displays to us a reliable consistency. Points *a* and *b* fall on a line that is continuous (*sunexes*). It is just this change—from *a* to *b*, from "here" to "there"—across a regular quantifiable continuum that constitutes the "objective seat" (Aristotle, 1952,

p. 385) of time and time-consciousness. What we recognize as duration, as "before-and-afterness" (*proteron kai husteron*; Aristotle, 1952, p. 385) *reflects* the movement from "here" to "there." *Chronos* presupposes *kinesis*, accordingly, in precisely the sense that a reflection presupposes the thing reflected. But—and this is absolutely crucial—the reflection of movement is essential to its apprehension. It is "in" time that the change from *a* to *b* registers, "in" time that we measure the progress of a thing *x* across a continuous magnitude, that we capture and retain the *rhythm* of its journey. The definition Aristotle ventures at 219b captures this reciprocity with his usual terse efficiency. "[T]his," he says, "is just what time is, the calculable measure or dimension (*arithmos*) of motion with respect to before-and-afterness" (Aristotle, 1952, p. 387). Its central idea—*arithmos* (number, measure, dimension, rhythm)—is then expanded in the following paragraph:

> *Time, then, is not movement, but that by which movement can be numerically estimated. To see this, reflect that we estimate any kind of more-and-lessness by number (*arithmoi*); so, since we estimate all more-or-lessness on some numerical scale and estimate the more-or-lessness of motion by time, time is a scale on which something (to wit movement) can be numerically estimated.*
>
> **– *Aristotle (1952, p. 387)***

The idea of *chronos* as *arithmos*—as the scale or measure of objects in motion—anticipates Kant's definitively modern description of it in *The Critique of Pure Reason* as "the form of inner sense" (Kant, 1965, p. 77). Indeed, Aristotle himself recognizes as a consequence of his argument an essential bond between time and consciousness, which is to say, time's nonobjectivity (Aristotle, 1952, p. 419). And, although he does not revisit the dialectic of IV, 10 with that nonobjectivity explicitly in mind, we can imagine how it might be reframed and resolved explicitly in this connection. Time seems to disappear on us when we caricature it as an object, when (standing back from it) we treat it as a kind of thing. The lesson of its apparent disappearance is precisely the necessity of conceiving it in terms of consciousness-dependent *arithmos*.

Armed with this precision, we gain access to what seems to me a crucial dimension of the everyday experience of procrastinating described earlier. It involves cleaving to the very caricature Aristotle wants to avoid. Putting off the renewal of my driver's license, as I said earlier, I lean on what an objective assessment of my situation assures me is the unreality of the future. But that is not all I do. Sincere belief in the unreality of the future would rule out recognition of my responsibilities as a driver and the consequent necessity of my taking action on my license altogether. When I assure

myself that I might "just as well do the work I am putting off Thursday at 1:00 pm, Friday at 1:00 pm, or even next week," something else is in play. At the same moment I assuage my anxiety with the thought of the "not yet's" nonobjectivity, I imagine a series of future times as workspaces capable of accommodating and facilitating my labor in roughly the way the four walls of a hotel suite might. In other words, I affirm the contraries of the original dialectic. Procrastinating, I posit the objective unreality *and* the objective reality of time simultaneously—making no distinction between reflection and what is reflected, between measuring and what is measured. I adopt the epistemological stance handed down to me by the Aristotelian tradition while eschewing the distinction between objects in motion and *arithmos* central to Aristotle's own analysis.

One aspect of the "shell game" of procrastination, then—one of the forces at play in my accepting the unconvincing tales I tell myself in order to put things off—can be articulated in terms of the account of *chronos* that emerges in the *Physics* and runs through the entire philosophical tradition: I make of time an abstract object that both tranquilizes my present anxiety and promises me a future workspace. I do this, as I say—in caricature of the finer analysis of time in Aristotle—by reifying the contending elements of the dialectic of time as object with which he begins. Here (I want to stress) procrastination plays Aristotle and the tradition false, but there is also an important sense in which the Aristotelian account serves the abstraction procrastinators find so helpful. It has to do with his interpretation of the "now." This is the third and final point to which I wish to draw attention.

Come back to the dialectic of time with which Aristotle begins, that is, the problem of time's "equivocal and obscure" objective existence in the face of which he proposes the distinction between things in motion and their *arithmoi*. The elements of *chronos* we recognize in experience naively are the "no longer," the "not yet," and the "now." The "no longer" appears subject to the nonexistence of all things past, the "not yet" to the nonexistence of all things future. On the basis of everyday understanding, granting these points, we might have expected Aristotle to salvage something temporally real in connection with the "now"—the present we intuit as always with us. It certainly seems more objectively robust and urgent. Its claims on our senses, appetites and attentions seem much harder to deflect or ignore. But, as I previously mentioned in passing, the argument of *Physics* IV, 10 is that the "now" is of all things temporal the most abstract and

spectral—nothing but the moving, constantly self-renewing limit between the past and the future. At 218a, Aristotle writes:

> *The present 'now' is not a part of time at all, for a part measures the whole, and the whole must be made up of the parts, but we can't say that time is made up of 'nows'. Nor is it easy to see whether the 'now' that appears to divide the past and the future is always one and the same or perpetually different.*
>
> **– Aristotle (1952, pp. 373/375)**

The concept of the "now" as a dimensionless moving limit or "divide" is ultimately necessary for making sense of the definition of time given at 219b. Only in light of a dynamic "present" that divides the "no longer" from the "not yet" is motion from "here" to "there" actually retraced—reflected—across or over against a continuous magnitude. Although qua division this "now" is not itself a measurable duration (a part of time), qua self-renewing motion it is its very substance, that is, something like the *performance* of *arithmos*. Aristotle says simply at 220a: "[T]ime owes its continuity to the 'now' …" (Aristotle, 1952, p. 391). In all of this, however, the imaginative correlate is an abstract point acting simultaneously as an agent of difference and of identity. Which is to say, Aristotle's analysis of the "now"—of *chronos in act*—already harbors the kind of contradictory or "magic" spatiality that makes the "shell game" of procrastination possible. I tranquilize whatever anxiety is associated with my deferral of work (at least in part) by assuring myself that at some point in the future—in some other "now" different from the one I am living at present, more conducive to shouldering the responsibilities I am putting off—I will be in a better position to do it. At the same time, I regard that point (Thursday at 1:00 pm, Friday at 1:00 pm, or even next week) as identical in all important respects to the "now" in which I procrastinate. I imagine myself *again* in my office, *again* at my desk, *again* confronting the pile of accumulated mail, having sacrificed nothing essential by substituting the workspace of the future for that of the present. In the end, it seems to me, the picture of the "now" sanctioned by Aristotle's analysis of time cannot be separated from this evacuation of difference. The "now" of *chronos* as *arithmos* persists in its being precisely and only as a self-renewing abstract limit. But if—picturing the continuity of time—I am bound by this abstraction I will always be tempted to exchange one "now" for another. And insofar as I succumb to that temptation, I will never be able to convince myself that for the possibilities of that lie before me—mundane or life-altering—the right moment (*kairos*) has arrived.

KAIROS AND THE ECSTATIC TEMPORALITY OF BEING AND TIME

Turn now to Heidegger whose account of time I want to represent as the centerpiece of a possible philosophical response to the problem of procrastination. He differs from Aristotle on each of the points stressed in previous sections. Whereas for Aristotle, discussion of the nature of time belongs to the study of physics, for Heidegger it is the crowning phase of a fundamental ontology. Whereas for Aristotle, the methodological goal is objectivity, for Heidegger it is the elaboration of a phenomenology which begins with and returns to the lessons of concrete human engagement. Whereas for Aristotle, time is the *arithmos* of movement, for Heidegger it is the ontological meaning of "care" (*Sorge*)—namely, the set of engagements that constitute the human world. Whereas for Aristotle, any given moment is an abstract, dimensionless "now" (a division of the "no longer" from the "not yet" that, qua self-renewing limit constitutes *chronos* in act), for Heidegger it is the ecstatic space of a human project in which the past is taken up and transfigured—a space we recognize self-consciously in those mundane or life-altering situations where we take responsibility for the world in which we find ourselves, namely, in which we grasp time kairotically. Let me develop what I take to be the rationale for each of these differences.

Both Aristotle and Heidegger begin in philosophy by reframing explicitly the goals and practices of the traditions they inherit. Aristotle, looking back above all on pre-Socratic treatments of *physics*, calls for a kind of methodological rigor his forebears lacked. The analysis of natural phenomena needs to take proper account of empirical evidence and to culminate in demonstration. These ends, in turn, are best accomplished by engaging thinkers of the past critically, sifting out their strengths and weaknesses (among Aristotle's many contributions to the formation of our academic disciplines, we may count the invention of the literature review). Heidegger, looking back on the modern epoch that begins with Descartes, calls for a return from preoccupation with questions of epistemology to the study of Being—a study which, although incontestably fundamental, has been, in his view, oddly neglected by the West since Plato (Heidegger, 1962, p. 19). The remarkable progress of the natural and social sciences in the last three decades of the 19th century and the first two of the 20th century makes the project of this return especially urgent. The proliferation of new subdisciplines and technical vocabularies threatens to reduce the contemporary European university to an academic tower of Babel; that is, a collection of specialists examining a wide range of entities without any common

language. Heidegger sees in ontology, among other things, a means for reconstituting the unity of the sciences. All entities have Being in common. An appropriately discerning study of it may serve as a measure for the discourses of other disciplines. In the context of the study Heidegger proposes time plays a decisive role. It is the "horizon" (*Horizont*) inside of which we discover the "meaning of Being" (*Seinssinn*). To say clearly why this is so requires at least a provisional tour of the other departures from Aristotle previously mentioned.

Of these departures, the most pivotal—in the sense of constituting the condition for the possibility of the others—is a difference in methodological approach. Whereas Aristotle wants to treat time scientifically, Heidegger wants to grasp it phenomenologically. The phenomenological method has two distinct advantages. First, in the face of a tradition that takes for granted the reduction of what is outside consciousness to the status of mute object—that is, that begins, philosophically, with the presumptive metaphysical distinction between *ego cogito* and *res extensa*—it insists on exacting testimony as to the nature of the world from phenomena qua phenomena. In the well-known formula of *Being and Time*, 7, the goal is "… to let that which shows itself be seen from itself in the very way in which it shows itself from itself" (Heidegger, 1962, p. 58). Second, and precisely by means of that testimony, it seeks recovery of those structures that "remain hidden" (Heidegger, 1962, p. 59) in and by the metaphysical tradition.

Adherence to this approach in the elaboration of an ontology leads straightaway to the following question: From what phenomenon might we extract reliable testimony as to the nature of Being? The parameters of the answer are dictated by the method as such. It would have to be an entity which "showing itself from itself" exhibits an understanding of Being. Heidegger's technical name for this entity is *Dasein*, that is, the being (*das Seiende*) characterized by a *Da-* or "there," by the having of a "world." Accordingly, the fundamental ontology presented in *Being and Time* is a phenomenology of *Dasein*; an attempt to grasp and express the meaning of Being by eliciting the testimony of an entity in whose very existence that meaning is made manifest. However, the *Da-* or "there"—the having of a "world"—is precisely the thing that characterizes our human being. As a result, the phenomenology of *Dasein* unfolds as an extended interrogation of interrogators themselves, of entities whose being is Being-in-the-world (*In-der-Welt-sein*).

In Chapters 3–5 of *Being and Time* (Heidegger, 1962, pp. 91–224), Heidegger simply unpacks the constituents of this formula. First on the agenda

is the concept of "world." In modern philosophy the word tends to designate the aggregation of all objects present-at-hand (Heidegger, 1962, p. 93)—as indifferent qua objects each to the others as points in space. From the perspective of phenomenology, such a conception is both abstract and derivative. The world that "shows itself" to us in everyday experience, that is closest to us, is the concrete world of our working environment (*Umwelt*—literally the world around). In this environment, objects are not indifferent and unrelated. On the contrary, they appear to us as pieces of equipment ready-to-hand accommodated in advance in what Heidegger calls a referential totality. The hammer in the workshop refers us to the nails, the nails to the wood, the wood to the carpenter's bench, and so on. For the most part, these relations remain inconspicuous. But when we find a piece of equipment faulty or when it goes missing, the chain of references becomes forcefully present (Heidegger, 1962, p. 103). On such occasions, Heidegger argues, the world announces itself to us explicitly as a network of references—and we see that the objects comprising it mean something precisely in the context of that network. If, granting this, we go on to ask in what the ontological ground of the referential totalities that comprise the world might consist, the answer can only be the projects, plans, and activities of *Dasein* itself. But that means: grasped phenomenologically, *Dasein is* its world.

Recognition of *Dasein*/world as a fundamentally unitary phenomenon makes possible an overcoming of the prejudices of the objective stance adopted in Aristotelian science and taken over unreflectively in procrastination experiences such as the one described in this chapter's introductory remarks. The image of the times of the world as a series of hotel rooms we might inhabit assumes that the world itself is ontologically independent of us, that we must constantly negotiate the terms according to which we cross over into it. Against this assumption, Heidegger argues that the world—the phenomenon that bears and exhibits time whether in the manner stipulated by the *Physics* or in some other way—is itself founded on our engagements. The lesson of his phenomenology is that we can stand back from the world—that we can cultivate the attitude of objectivity—only because we are always already involved with it. Only, that is, because our *Dasein* is always already itself *Being-in*-the-world, that is, always already it's "there." A nonderivative or primordial conception of time, accordingly—what I have called, anticipating Heidegger's thesis, a kairotic conception—requires an account of the constitution of this "there."

Providing just such an account is the business of *Being and Time* 5 (Heidegger, 1962, pp. 169–224). In it, Heidegger identifies three structures

he takes to be "equiprimordially" constitutive of *Dasein*'s "there." The first, in order of presentation, he calls state-of-mind (*Befindlichkeit*)—what we know in everyday life as mood. *Dasein* is such that it finds itself always already thrown into the world in a certain way, such that its environment matters to it or weighs on it. In states of joy or ecstasy, everything is light. In a state of boredom, things present themselves as tediously indifferent. When we are angry, everything strikes us as provocative, intolerable. Although we may resolve to alter our states-of-mind and are sometimes successful in doing so, the fact of mood—of our finding ourselves disposed to the world in one way or another—is itself nonnegotiable. *Dasein* is as thrown into the world, as subject to a valence and significance in things always there in advance. A second constituent of the "there" Heidegger calls understanding (*Verstand*). In contrast to the thrownness characteristic of state-of-mind, it consists essentially in projection. *Dasein* is such as to be always ahead of itself in terms of some plan, some concrete engagement. I am preparing for a run or driving to the Maritimes, planning my afternoon or contemplating the argument I want to make in this essay. No moment of my consciousness life is devoid of projects. They provide the sense and context for everything I encounter. Indeed, projective understanding is the technical name for the ontological ground of the referential totalities previously discussed in connection with the phenomenological analysis of our working environment. Finally, the "there" is constituted by what Heidegger calls discourse (*Rede*)—language in a very wide sense that includes nonverbal forms of communication (gestures, postures) and "telling silences." The intelligibility of the world that emerges as a result of *Dasein*'s state-of-mind and its understanding—as a result, that is, of its thrown projecting—is always in some way expressed and made explicit. This happens when we speak to each other—prosaically ("hand me that hammer," "I'll pick up the car at the garage"), in the course of explanations ("the directions to the Holiday Inn are as follows," "Aristotle says three things of note on the subject of the 'now'"), rarely but far more vividly in flights of rhetoric or poetry ("I have a dream, today," "Do not go gentle into that good night"), but also by means of the tone we take, our facial expressions, our "body language," and the things we decide to leave unsaid.

For purposes of exposition and analysis, we may pull apart state-of-mind, understanding, and discourse. In lived experience, however, we never encounter one of the constituents of *Dasein*'s "there" in isolation from the others. On the contrary, they comprise a single unified structure to which Heidegger gives the name "care." *Dasein* is "care"—namely, self-conscious

engagement of the world disclosed to it by the thrownness manifest in its state-of-mind and the projection manifest in its understanding. What, though, is the ontological meaning of this unified structure? What is it that makes "care" possible? In a state-of-mind, I find myself *always already* thrown into the world. Moods, phenomenologically conceived, show us the necessity of something like the past. In projective understanding, I am *ahead of myself* in pursuit of some purpose. Projects, phenomenologically conceived, show us the necessity of something like the future. In discourse, I make intelligible how things are *in a given moment* defined by the manner in which I take over my thrownness in a determinate projection. The expression of what is transpiring in my situation is a making present. The ontological meaning of "care," accordingly—the condition for its possibility—is temporality, time.

The Heideggerian concept of time as the ontological meaning of "care" differs from the Aristotelian concept of time as the *arithmos* of movement in at least two important respects. First, it reverses the time/space priority relation. *Arithmos* is the measure or reflection of movement—subordinate to the *cosmos* in motion. In the *Physics*, time follows space. "Care" as Heidegger conceives it, on the other hand, is the origin of space itself. The movements and distances we grasp presuppose our projects (my hometown is a 10 hour drive from Sherbrooke, North Hatley is within easy biking distance, etc.). Even abstract scientific calculations derive from *Dasein*'s concrete engagement of the world (the possibly habitable planet in a nearby solar system is 160 light-years away). Second, the Heideggerian concept of time substitutes for the traditional image of the segmented line an "ecstasis" (*Ekstase*)—an opening up or self-transcendence. Time is not the span of a "no longer" and that of a "not yet" divided by a "now," still less the perpetual self-renewal of the dimensionless "now-point." On the contrary, each moment is a unity of ecstases—thrownness, projection, and their making present. On this account, existential temporality is never primordially uniform, abstract, or empty. It is the concrete truth of the human world. Under what circumstance is this truth attested and exhibited?

At this point we come explicitly to the Heideggerian equivalent of what Aristotle's contemporaries called *kairos*. The primordial structure of existential temporality becomes transparent on those occasions—in those moments—where *Dasein*, in full recognition of its own finitude (i.e., cognizant of its mortality, of its death, precisely as the limit of its projections) takes responsibility for its thrownness (i.e., for how it finds itself in the world, for making something of the possibilities handed down to it by its personal

history and the wider histories of the groups and cultures always swirling around it). In such moments, *Dasein* is authentic. It accepts and affirms explicitly the unity of the temporal ecstases that constitutes its very Being. Authentic *Dasein* regards every moment qua moment as kairotic—the right moment, the moment appropriate for and constituted by its resolute projection.

For the phenomenologist, striving to "let that which shows itself be seen from itself in the very way it shows itself from itself," the kairotic moment exhibits the truth of time. In its ecstatic character, we see played out the event of opening or clearing that is the ontological foundation of *Dasein/* world and everything that transpires for/in it. But that event of opening, thought in its own terms, is precisely what Heidegger calls Being. This is the sense, coming back to my introductory remarks, in which *Being and Time* as a whole may be read as an exercise in recovering *kairos*. Time properly understood—rescued from the abstractions of the metaphysical tradition that begin in earnest with Aristotle's dialectic of the "no longer," the "not yet," and the dimensionless "now"—constitutes the theater, the horizon of Being as such.

In one sense—we noted it earlier remarking Heidegger's conception of "world"—the implications of the phenomenology of *Dasein* for an analysis of procrastination are clear. To the extent that I grasp time kairotically—as the ontological meaning of the care structure that defines me as an entity—I deny myself the implements of the shell game I described in relation to the renewal of my driver's license. I can no longer "stand back" from time in the course of planning my afternoon because I now conceive it as radically non-objective. I can no longer indulge some form of the dialectical illusion that the future is unreal because I now conceive it as the substance of my projective understanding. And the proposition that I might "just as well" fulfill my civic and legal responsibilities Thursday at 1:00 pm, Friday at 1:00 pm, or even next week—while perhaps still "factually" true—cannot lean any longer on an image of time drawn from the uniform dimensionless "now." On the contrary, I see the truth of each moment from the perspective of *Being and Time* as the making present of a determinate and nonrepeatable thrown projection, which offers me determinate and nonrepeatable possibilities.

Where, though, might we see the concept of time as *kairos* "put to work" in roughly the way the Aristotelian *chronos* is "put to work" in the procrastinator's rationalizations? As is perhaps evident even in the thumbnail sketch just now provided, Heidegger's account of ecstatic temporality is notoriously structural. I recall the punch line of an old joke among his students in the

1920s, very much taken with the analyses of finitude and responsibility but unsure as to what might be required for translating them into action: "I am resolved!" one would say to another, "On what, I don't know!" Speculation on the role recognition of time as *kairos* could play in a possible therapeutic approach to procrastination will be helped along to the extent that we can imagine situations of "self-regulation success" that embody the elements of authenticity.

KAIROS IN CONCRETE EXPERIENCE—MARTIN LUTHER KING'S "MOUNTAINTOP SPEECH"

In 25 years of presenting the arguments of *Being and Time* to undergraduates, I have had ample opportunity to think about how Heidegger's phenomenological analyses might be "cashed out" in more familiar and/or accessible terms. For example, I have used the crash of a colleague's personal computer to illustrate the announcement of "world" as referential totality; the sad emptiness of my grandfather's house after his funeral to unpack mood as a feature of *Dasein*'s "there" (i.e., as the way *things themselves* matter to us); the Beatles' song, "Boy, You're Gonna Carry That Weight," as a catchy expression of the existential guilt that culminates in recognition of absolute responsibility for a past we do not ourselves create or determine in advance. Accumulating and deploying these examples, I have been especially interested in imagining more vividly what Heidegger calls "anticipatory resoluteness"—the blossom, in action, of authentic *Dasein* in which we see the full historical significance of existential temporality. The structure of this phenomenon Heidegger summarizes in *Being and Time*, 74.

> Only an entity which, in its Being, is essentially ***futural*** so that it is free for its death and can let itself be thrown back upon its factical 'there' by shattering itself against death – that is to say, only an entity which, as futural, is equiprimordially in the process of ***having been***, can, by handing down to itself the possibility it has inherited, take over its own thrownness and be ***in a moment of vision*** for 'its time.' Only authentic temporality which is at the same time finite, makes possible something like fate, that is to say, authentic historicality.
>
> ***– Heidegger (1962, p. 437)***

Everything I want to convey in the word *kairos* the Macquarrie and Robinson translation renders here in the phrase "moment of vision" (the German is *Augenblick*—literally "the blink of an eye"): a temporality transparently related to its ecstatic source—which is to say—to a projection

aiming explicitly and resolutely at redemption of the past that sees and accepts only the finitude of *Dasein* itself—that is, only death—as its genuine limit.

Working on something else entirely about 5 years ago I stumbled on a YouTube version of what is popularly known as the "Mountaintop Speech"—a sermon delivered by Martin Luther King at the Mason Temple in Memphis, Tennessee, Apr. 3, 1968. I was so affected by the message and the rhetorical power of its delivery that I sought out the text online in order to study it more closely. In the course of that reading, it occurred to me suddenly that Dr King's speech embodied almost perfectly the structures of "anticipatory resoluteness"—of Heidegger's "moment of vision." I would draw attention, above all, to three things.

First, it presents the struggle of the civil rights movement against the repressive governments and police forces of the day explicitly as a crusade in defense of the American constitution—that is, of the political and spiritual heritage those authorities claim to defend. What is at stake—in Memphis, in Birmingham, and elsewhere—is reanimation of a collective past. This is especially clear in the condemnation of court injunctions obtained by the Memphis city council against public demonstrations in support of striking sanitation workers:

> *Now about injunctions: We have an injunction and we're going into court tomorrow to fight this illegal, unconstitutional injunction. All we say to America is, "be true to what you said on paper". If I lived in China or even Russia, or any totalitarian country, maybe I could understand some of these illegal injunctions. Maybe I could understand the denial of certain basic First Amendment privileges, because they hadn't committed themselves to that over there. But somewhere I read of the freedom of assembly. Somewhere I read of the freedom of speech. Somewhere I read of the freedom of press. Somewhere I read that the greatness of America is the right to protest for right. And so just as I say, we aren't going to let dogs or water hoses turn us around, we aren't going to let any injunction turn us around. We are going on.*
>
> ***– King, (1968, p. 4)***

In these words, Dr King makes what Heidegger calls a "reciprocative rejoinder" (Heidegger, 1962, p. 438) to the founding document of the American state. The implication of the repeated phrase "somewhere I read" is that the constitution has value only insofar as we keep its fundamental possibilities in front of us, insofar as we find ways of renewing them in response to present exigencies—which is to say—insofar as we take them to be "essentially futural." The artifacts of a past that is merely behind us have no binding moral or political authority. They are spectral, part and parcel of the "no longer" that evaporates in the dialectical argument of

Aristotle's *Physics*. Either the American constitution is taken up every day and resuscitated—in the crusade for civil rights or in some other project—or it becomes the worthless refuge of hypocrites. Either it becomes a mode of "having been" or of "thrownness" that *Dasein* "hands down to itself" in a "moment of vision"—in *kairos*—or its founding power is lost.

Second, any moment in which we regard the possibilities of our heritage as "*essentially* futural" is a moment of absolute responsibility. When, in the face of the "dogs and water hoses" awaiting his marchers, Dr King says simply "we are going on," the commitment is unequivocal. The events of the very next day were to reveal with terrifying finality the radical nature of his project. On Apr. 4, 1968, Martin Luther King was assassinated. But the "freedom for death" so sadly actualized in his murder is also attested—acknowledged and embraced as the defining framework of his action—in the stirring end of the sermon itself:

> *And then I got into Memphis. And some began to say the threats, or talk about the threats that were out. What would happen to me from some of our sick white brothers? Well, I don't know what will happen now. We've got some difficult days ahead. But it really doesn't matter to me now, because I've seen the mountaintop. And I don't mind. Like anybody, I would like to live a long life. Longevity has its place. But I'm not concerned about that now. I just want to do God's will. And he's allowed me to go up to the mountain. And I've looked over. And I've seen the promised land. I may not get there with you. But I want you to know tonight, that we, as a people, will get to the promised land! And so I'm happy tonight. I'm not worried about anything. I'm not fearing any man! Mine eyes have seen the glory of the coming of the Lord!!*
>
> **– King (1968, p. 8)**

The "Mountaintop Speech" concludes with an endorsement of the absolute responsibility Dr King is enacting. Indeed, one of its central virtues is this harmonizing of word and deed. If "self-regulation failure" has at its core an inability to act on espoused values—in the case of the procrastinator, to undertake or complete work she or he has agreed to undertake or complete for her/himself or others—then here we have its opposite, namely, self-regulation success, unity of value and action. The conception of time underlying this "success" is explicitly kairotic: The moment in which Dr King finds himself, speaking to those gathered at the Mason Temple, is actually presented as the perfect occasion for "anticipatory resoluteness," for creative repetition of the possibilities of the past handed down to those advocating for civil rights by the founding fathers of the American state.

This is especially clear, finally, in the sermon's preamble—a rhetorical flourish that establishes the frame of everything that follows. For our purposes, it is worth citing in full. It offers, in the language of the preacher/activist,

the philosophy of time that makes possible apprehension of the truth of the present moment:

> *Something is happening in Memphis; something is happening in our world. And you know, if I were standing at the beginning of time, with the possibility of taking a kind of general and panoramic view of the whole of human history up to now, and the Almighty said to me, "Martin Luther King, which age would you like to live in?" I would take my mental flight by Egypt and I would watch God's children in their magnificent trek from the dark dungeons of Egypt through, or rather across the Red Sea, through the wilderness on toward the promised land. And in spite of its magnificence, I wouldn't stop there. I would move on by Greece and take my mind to Mount Olympus. And I would see Plato, Aristotle, Socrates, Euripides and Aristophanes assembled around the Parthenon. And I would watch them around the Parthenon as they discussed the great and eternal issues of reality. But I wouldn't stop there. I would go on, even to the great heyday of the Roman Empire. And I would see the developments around there, through various emperors and leaders. But I wouldn't stop there. I would even come up to the day of the Renaissance, and get a quick picture of all that the Renaissance did for the cultural and aesthetic life of man. But I wouldn't stop there. I would even go by the way that the man for whom I am named had his habitat. And I would watch Martin Luther as he tacked his ninety-five theses on the door at the church of Wittenburg. But I wouldn't stop there. I would come on up even to 1863, and watch a vacillating President by the name of Abraham Lincoln finally come to the conclusion that he had to sign the Emancipation Proclamation. But I wouldn't stop there. I would even come up to the early thirties, and see a man grappling with the problems of the bankruptcy of his nation. And come with an eloquent cry that we have nothing to fear but fear itself. But I wouldn't stop there. Strangely enough, I would turn to the Almighty, and say, "If you allow me to live just a few years in the second half of the 20th century, I will be happy." Now that's a strange statement to make, because the world is all messed up. The nation is sick. Trouble is in the land; confusion all around. But I know, somehow, that only when it is dark enough can you see the stars. And I see God working in this period of the 20th century in a way that men, in some strange way, are responding.*
>
> ***– King (1968, pp. 2–3)***

In this imaginative exercise, Dr King actually retraces in outline the central distinction I want to make between *chronos* and *kairos*. He begins with the mental exercise of objectifying temporality (if I were standing at the beginning of time, with the possibility of taking a general or panoramic view of the whole of human history up to now). He then reviews all the moments that might have engaged him if engagement depended on the appeal of a objective circumstance—again, returning to the metaphor we used in discussion of Aristotle, as if he were a time tourist looking for a good hotel. In the end, however, he chooses precisely the moment in which he finds himself (If you allow me to live just a few years in the second half of the 20th century, I will be happy). He makes this choice in spite of the fact

that that moment has no objective appeal (Now that's a strange statement to make, because the world is all messed up). But the point is not to show how the spiritual squalor of the racist US south in the second half of the 20th century trumps the glory of ancient Greece or Rome. It is to argue that the arrival of the right moment, of *kairos*, makes the rationalization of time and times in objective terms irrelevant.

Dr King's preamble evokes the recovery of kairotic understanding Heidegger describes in terms of authenticity. Here, it bears repeating, we need to recognize an experience that is in important respects the opposite of the everyday rationalizing I illustrated earlier in connection with the renewal of my driver's license. And it seems to me, accordingly, that the hypothesis to be turned over in theory and tested in therapeutic practice is the following: Wherever the apprehension of *kairos* as the truth of time prevails, wherever we are prepared to say to the proverbial "Almighty" … "set me down just here, this is the right moment," the temptation to procrastinate disappears. This much, at least, seems evident: In the "Mountaintop Speech"—an address which, its *gravitas* notwithstanding, contains some deft touches of humor—it is not even "comically" possible to imagine Dr King saying (in paraphrase of St. Augustine) "O Lord make me resolute—but not yet." Any such shell game played out for that congregation in the Mason Temple would surely have been unthinkable, absurd.

CONCLUSION—*KAIROS* IN A THERAPEUTIC PRACTICE

The "Mountaintop Speech" is an event of great historical importance. The kairotic understanding of time framed in it is extraordinarily vivid and clear. But the structures of "anticipatory resoluteness" that Dr King both exposits and performs—the assumption of absolute responsibility for the moment in which he finds himself (for "thrownness"), the affirmation of that moment as a "moment of vision" (*Augenblick*), as "the right moment" (*kairos*)—may be found as well in the less spectacular circumstances of everyday life: in the resolve of the alcoholic who, after years of denial, finally stands up in an AA meeting and looks his past and its consequences squarely in the face; in the determination of the young adult who, estranged from her parents and embittered by their neglect, seeks reconciliation in the knowledge that her own future depends on at least partial redemption of what she perceives as the failures of her childhood; in the initiative of the middle-aged man who resolves to subject himself to the discipline of exercise and dietary reform after years of having let such things slide. And because this is the case, it

seems to me that something like "anticipatory resoluteness" may be clarified and encouraged in a therapeutic practice designed to address the problem of procrastination.

Of the wider approaches that might accommodate this work, what Schneider and Krug (2010) present under the umbrella of existential-humanistic therapy seems to me the most natural fit. It springs directly from the tradition in continental philosophy of the last 150 years (especially Kierkegarrd, Nietzsche, Husserl, Heidegger, Buber, Sartre, and Merleau-Ponty). The modes of its analysis and interaction, though various, overlap with and invite naturally the kinds of phenomenological descriptions we find in *Being and Time* (for detailed case studies, see Yalom, 1989). Perhaps most importantly, a central goal espoused by practitioners is "the cultivation of presence"—by which is meant: discovery, in therapeutic encounter, of the manner in which our lived past and imagined future are experienced here and now (Schneider & Krug, 2010, pp. 18–19). In the spirit of that exercise, drawing on the Heideggerian principles now at our disposal and looking at the problem of procrastination specifically, I can imagine a series of three therapeutic exercises that might promote "self-regulation success" and well-being (in-the-world).

First, therapist and client could work toward a phenomenology of day-to-day procrastination—a more careful and detailed analysis of the kind of experience I described in my introductory remarks. Researchers have recognized in the clinical testimony of procrastinators a mix of positive and negative feelings (Tice & Bratslavsky, 2000). What sorts of images and/or preconceptions run through this mix in determinate situations? Or to pose the question in a specifically Heideggerian way: How is it, exactly, that the world weighs on individual patients at the point of procrastinating? What makes it unbearably tedious, frightening, or overwhelming? And how, exactly, does putting things off broker relief? What must we think about ourselves and our relation to things in order to be tempted by a deferral of work we may recognize simultaneously as unavoidable? In drawing the distinction between *chronos* and *kairos* as described in previous sections, I remarked on the epistemological primacy, for Aristotle and the tradition that follows him, of the objective stance. And we saw, in contrast, that for Heidegger—for phenomenology—"objectivity" is always derivative—that is, that *Dasein is* its world; that we may step back from things—including time itself—only because we are always already engaged and involved with them. A therapeutic conversation cognizant of this philosophical cleavage could explore fruitfully the preconceptions of self, world, and time that

foster the procrastinator's mood management and call them explicitly into question. And a therapeutic approach based on existential principles might serve as an effective route to emotion regulation (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being for further discussion of the central role of emotion regulation in procrastination).

Second, as an exercise in imagining self, world, and time differently, the therapist and the client could recover, describe, and evaluate a selection of experiences that make manifest something like what Heidegger calls "anticipatory resoluteness." Every life has such experiences—if not as a result of the kind of courageous deliberation already described (world-historical/personal), then simply in reaction to exigencies of circumstance. I remember, for example, hiking in Ontario with a friend in my early 20s'. We came to a river that looked easily fordable and began to cross. But the water was deeper and the current considerably stronger than we had imagined. Before we knew it, we were beyond our waists struggling to keep from being swept off toward a significant fall of rapids we could see in the distance. Suddenly the world and everything in it was forcefully present. It was clear to us that every step, as we felt our way across the slippery rocks of the uneven riverbed, was taken in absolute responsibility. When, having reached the other bank, we lay side by side collecting ourselves, we marveled at the exhilaration and pride we felt in ourselves for meeting the unexpected challenge. In everyday life, we "rise to the occasion" in any number of ways that require kairotic understanding. These events may be described with the same care and by means of the same methods we use in generating our phenomenology of procrastination. Therapist and client might pay special attention, here—testing the hypothesis presented earlier—to the ways in which the images and preconceptions at play in kairotic experience sideline procrastination in advance. In a best case scenario, something like the following question would emerge: What is it in the resolute agent that quenches entirely the familiar temptation to put things off?

Finally, pursuing this question, therapist and client might elaborate as a frame for deeper reflection a Heideggerian version of Yalom's (1980) four "givens" of existence (i.e., death, freedom, isolation, meaninglessness)—focusing especially on the issue of time and its management. Here the point would be to develop basic existential structures in a language accessible to and appropriate for the particular client and to recast the understanding of temporality in terms of those structures. If Heidegger is right, we are essentially "projectors"—perpetually ahead of ourselves. Our futures are not distant, spectral "nows." They are defining ecstases of the present. If Heidegger

is right, we are absolutely responsible for a world into which we are always already thrown. Our pasts are not behind us, "nows no longer." They are, paradoxically, always in front of us—the substance of our projective understanding, the "givens" whose possibilities we are called upon to redeem in every moment (as Dr King felt called upon to redeem the possibilities of the American constitution, as the recovering alcoholic feels called upon to redeem the meaning of his struggle with the bottle). But that means, if Heidegger is right, every moment is a moment in which both future and past are at stake; every moment is, at least potentially, the decisive moment, the right moment. Here, at a deeper level, clients again purge the images and preconceptions of time they use to sanction their procrastination. If this conversation is fruitful—if the therapist and client, working together, are successful in recovering *kairos*—only one thing remains: to live in time in a way harmonious with their understanding of it. That, of course, is the most difficult thing of all. But the wager of existential-humanistic therapy is that consciousness of the truth is an indispensable first step toward its embodiment.

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CHAPTER 3

Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay

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INTRODUCTION

Despite its familiarity, procrastination is a strange phenomenon. This is due, in large part, to the fact that it involves doing something that one knows at some level to be foolish. Procrastinators participate in their own self-undermining knowingly, not inadvertently or because they genuinely forgot about a deadline. Indeed, if delay is to count as procrastination at all, it must meet something akin to the *mens rea* (guilty mind) standard used in jurisprudence.[a] This means that procrastination is something that can be attributed only to those who are struggling with the irrationality of their delay. This is a matter of definition. Just as self-deceivers know, at some level, that what they want to believe is not really supported by the evidence, procrastinators are nagged by a sense that they cannot legitimately defend putting things off any longer. If one had no awareness of doing anything wrong—and could not reasonably have been expected to have developed that awareness—then the term "procrastination" does not apply.

Many discussions of procrastination downplay the extent to which procrastination is intentional, and there is room for disagreement or, at least, qualifications. But there is an important reason for emphasizing this *mens rea* dimension, for it highlights the importantly cognitive or *epistemic* aspect of many procrastinators' internal struggle: their motivated attempts to avoid candidly acknowledging how counterproductive their delay is, often by

[a] The full phrase is usually, "*actus reus non facit reum nisi mens sit rea,*" or "the act is not culpable unless the mind is guilty." For a discussion of some of the related complexities, see, for example, Alexander & Kessler (1997) and Cane (2000).

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reconstruing what they are doing as not *actually* procrastination. This focus opens up room for investigating the role of self-licensing and neutralization techniques in the etiology and persistence of procrastination. Furthermore, this focus on procrastinators' motivated strategies for managing their conflicted self-knowledge sheds new light on potential strategies for reducing procrastination, in particular, strategies that involve structuring or restructuring one's situation in ways that support one's better self (and more honest self) in these internal struggles.

Many readers may object to the seemingly moralistic and judgmental connotations of speaking of the "*mens rea*" dimension of procrastination. There has even been a strong undercurrent in recent discussions of procrastination that challenges the very idea that procrastination is necessarily something bad at all (Chu & Choi, 2005). And it is with one of these attempts that I begin, namely, John Perry's (1995) advocacy of "structured procrastination." Indeed the title of the present essay is meant to flag both a debt and a disagreement in connection with Perry's essay—perhaps the most widely read essay on procrastination, "Structured Procrastination," which he subsequently developed into a short book (Perry, 2012). Perry has eloquently discussed the importance of structures to being productive, highlighting the various ways in which our situation shapes and channels our ability to resist the temptation to put off aversive tasks. However, his approach is also symptomatic of a tendency to downplay the *mens rea* dimension of procrastination and, as a consequence, to fail to distinguish procrastination from unproblematic forms of delay (a tendency even more pronounced in work on so-called "active procrastination") (Chu & Choi, 2005). This has the further effect of hiding from view the important array of strategies that can be taken to reduce procrastination by altering one's environment, for example, so as to achieve important health goals.

In the following theoretical and philosophical reflections, I use Perry's suggestions as a point of departure for making three points. First, I offer an analysis of the "*mens rea*" character of procrastination, as including a self-critical awareness of "unwarranted delay" in the definition of procrastination. Second, I develop a proposal to focus on self-licensing and neutralization techniques as part of the etiology of much procrastination, as self-indulgent attempts to protect one's positive self-appraisal by reconstruing one's delay as unproblematic. Third, I build on my earlier work on the "extended will" (Anderson & Kamphorst, 2015; Heath & Anderson, 2010) to suggest that one way of reducing procrastination is by establishing structures that counteract one's attempts at self-licensing. In this sense, I propose

to replace the focus on structured procrastination with one a structured nonprocrastination.

HOW NOT TO BE MISLED BY "STRUCTURED PROCRASTINATION"

In 1995 the Stanford philosopher John Perry posted to the web a short piece entitled "Structured Procrastination." In that essay, Perry describes how people can actually be very productive by structuring their to-do lists in such a way that the aversion against doing the task at the top of the list can serve to raise one's level of productivity on other tasks on the list. The idea is that a nagging task can facilitate one's happily completing a whole range of activities that one is motivated to do only because it is less aversive than the nagging task. As he puts it, "the procrastinator can be motivated to do difficult, timely and important tasks, as long as these tasks are a way of *not* doing something that is seemingly more important. Structured procrastination means shaping the structure of the tasks one has to do in a way that exploits this fact" (Perry, 1995). The sort of example he has in mind are familiar academic tasks such as writing referee reports or letters of recommendation.

Perry's discussion of the phenomenon is lighthearted and even whimsical, both in the original essay and the subsequent book (Perry, 2012), but there are actually several quite subtle and important points that he is making. The first point is that by structuring our environment, we can improve outcomes, particularly in situations in which we are not fully in control of our actions. As I shall put the point later, by putting in place scaffolding for ourselves, we can extend our powers of will to carry us through cases in which our capacities for self-regulation fail us. The thing to note, however, is that when Perry speaks of "structured procrastination," he is actually not making any recommendations for how to reduce one's procrastination; he pretty much takes it for granted that those who benefit from his recommended strategy are not employing the structures to reduce the actual procrastination, but merely to minimize the damage. By continuing to get *something* done, "structured procrastinators" both mitigate the loss of productivity and provide some support for the individual's motivation and self-efficacy (on the latter concept, see, e.g., Bandura, 1995, 2004).

This last point plays a central role in the more developed account found in Perry's (2012) book, *The Art of Procrastination*. There, the regular theme

is that procrastinators should avoid beating themselves up about their procrastination and that it is easier to do this when one can point to the beneficial results that one has achieved while procrastinating—apartment cleaned, emails answered, books alphabetized, and so forth. In many ways, this is an important point about avoiding the vicious cycle of demotivating self-incrimination. It even has some resonances with recent work on self-compassion (Sirois, 2014), with one important difference: mindful acknowledgment of one's failure to meet one's intentions plays no part in Perry's account, although it is central to the form of mindfulness usually involved in procrastination-reducing forms of self-compassion (Sirois & Pychyl, 2013).

And this is where a central misgiving arises about Perry's discussion of structured procrastination, which is formulated in a way that suggests that structured procrastination is, on balance, a good productivity strategy that is preferable to addressing the procrastination itself. I want to be clear on this point. I think that Perry is careful to avoid this in the actual text, but he also displays a penchant for highlighting the paradoxical benefits of self-deception in this connection. Moreover, it is a very tempting message: if you stop thinking of yourself negatively, as a procrastinator, you will find yourself getting a lot done. And that does start to sound like a strategy of encouraging self-deception and acceptance of one's tendency to procrastinate. Particularly when combined with the attraction held by advocates of the claim that there are phenomena such as "active procrastination" (Chu & Choi, 2005) that are actually highly effective approaches to getting things done, it becomes clear that this is a domain in which one needs to be very careful about how the concepts are being defined and used.

Ultimately, it is an empirical question whether there are not indeed some individuals who get more done if they convince themselves by approaching matters in the ways Perry suggests. But there is also something inherently unstable about the strategy, in that it requires that one think of what the tasks one engages in as both *not* the tasks one should be engaging in and, at the same time, the tasks that one *should* be engaging in, since otherwise one would be getting nothing done. Moreover, this last point raises questions about whether one's overall pattern of behavior can even count as procrastination, particularly the more one endorses the strategy as leading to the greatest overall productivity. Indeed, if we are to avoid being misled by Perry's discussion of structured procrastination, it is important to get clear on the definition of procrastination, something that Perry refrains from doing.

DEFINING PROCRASTINATION AS CULPABLY UNWARRANTED DELAY

There are numerous definitions of procrastination, yet most of the essential aspects can be captured concisely in the phrase "*culpably unwarranted delay*." In other words, procrastination involves choosing to put a task off to a later point in time, even though (1) there are overridingly good reasons not to put things off (the delay is "unwarranted") and (2) there are no circumstances that excuse one either for failing to appreciate these reasons or for failing to act. Each of the three components in this definition merits brief elaboration.[b]

Delay, to begin with the most obvious point, is a necessary component of procrastination. This means not only that someone who procrastinates fails to do something that she previously intended to do, but it also requires that she has not given up entirely on completing the task. Deciding not to do something *ever* is not procrastination, no matter how irrational or self-defeating this decision is. Anecdotally, it is actually quite characteristic of procrastinators that they are unwilling to acknowledge that their intention to do something "someday/maybe" is rather "anemic" (Allen, 2015; Stroud, 2010). Note further that delaying a task needs to be distinguished from departing from a scheduled time. Schedules and deadlines are means of making explicit and specific our temporal intentions, but we can delay doing something even if our plans are rather vague. For a person's behavior to count as delay, however, it must depart significantly from the intention and it must be possible to attribute to the individual an intention to actually do something to advance a goal. Someone who had a strong desire to climb Mt. Everest but never did anything to advance that goal would not count as procrastinating, if she never moved from fantasizing to planning.

The second requirement of procrastination is that the delay be "unwarranted."[c] Not all delay is procrastination (Haghbin, 2015; Pychyl, 2013). Sometimes our plans need adjustment and our intentions require updating in the wake of changing circumstances. Thus, any definition of procrastination must make clear the sense in which the relevant delay is problematic. There are various other terms that are used in the

[b]I should note that I am here not considering approaches to defining procrastination in terms of what the symptomology, that is, on the basis of criteria that stem from a particular pattern in the typical symptoms, treatment options, and/or etiology.

[c]My use of the phrase "warrant" owes a great deal to Toulmin (1964), who analyzes reasons as supported by warrant (as well as "backing").

literature: such as "irrational" (Silver and Sabini, 1981), "needless" (Haghbin, 2015; Steel, 2007) or "without valid reasons" (see Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency[d]). For example, in typical cases of health procrastination, this is a matter of being worse off as a result of the delay. Even if one *does* get around to exercising more or gets the recommended medical tests done or reduces one's sodium intake, one would have been much better off if one had started earlier. Of course, one cannot do everything at once, and sometimes we choose delay so as to do other things first. When that is the case—we are better off *on balance* by delaying the task—and then it is clear that we are speaking of strategic delay, not procrastination.

There are several further points to note about this requirement. First, delay is still unwarranted if, unexpectedly, things work out for the better. Someone who puts off making an appointment to have medical tests done would still count as procrastinating, even if the delay ends up resulting in improved treatment because a new apparatus arrived at the clinic only later. Conversely, it might be warranted to delay mowing the lawn because a severe thunderstorm is predicted during the next hour, even if it never ends up raining. It is only the *foreseeable consequences* that matter.

Second, the assessments of how warranted a delay is should ultimately be based on considerations internal to the procrastinator's values and life-plans. For those who authentically prefer thrills to stability, or social solidarity to their individual well-being, some instances of delay will be warranted that would not be for others who do not share these values. Otherwise, labeling behavior procrastination becomes indistinguishable from advocating substantive values, under the guise of a psychological category. Procrastination does violate social norms, but even obnoxious lateness is not procrastination unless it involves procrastinators thwarting the pursuit of their own goals. This is not, however, to deny that individuals may be temporarily confused about what their values are, and this introduces significant complications—which I cannot address here, but which deserve further attention—into attempts to adjudicate whether someone's delay is unwarranted.

Third, although what makes delay unwarranted is typically that it makes someone foreseeably worse off, there are cases of procrastination in which

[d]Note that, although the definition of bedtime procrastination that my coauthors and I provide in Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency focuses less on the issue of *mens rea*, both definitions are intended to cover the same phenomena.

it does not. In "Buridan's ass cases," there may be no reasons to do one of two tasks before the other, but one has simply decided to do task A before task B. Having formed this intention, the burden of proof shifts, such that putting off task A to do task B without a reason for doing so *does* count as unwarranted delay, even though one would not be better off as a result of doing the tasks in one sequence rather the other. This is because there is an irrational failure of will involved in not sticking to one's plan or resolution in such cases (Bratman, 1987; Holton, 2004).

Finally, it is particularly important to emphasize that the sense is which delay is unwarranted is also the sense in which it is the basis for *negative self-appraisal*. When delay is unwarranted, it is not that it is done "for no particular reason" but rather that it is foolish, for one is failing to do what one should do. The guilt and shame associated with procrastination (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being) may sometimes take on problematic and counterproductive forms, such that mindful self-compassion becomes an important part of responding to procrastination (Sirois, 2014). But these emotions are nonetheless a clear indication that doing what one has reason not to do is grounds for judging oneself negatively.

A third condition—*culpability*—is required to account for cases of unwarranted delay that do not count as procrastination. In part, this is needed to accommodate cases in which the delay is outside of one's control. Many of these cases are, however, already covered by the requirement that circumstance provide no warrant for delay (for a discussion of "inevitable delay," see Haghbin, 2015). But there is a further dimension that is particularly relevant to the *mens rea* analysis developed here, in that the starting point for attributing "procrastination" to individuals is that they *themselves* have the sense that there is insufficient warrant for their delaying a task. If they have genuinely lost track of a deadline or they sincerely believe that it would be prudent to delay, then they are not really procrastinating.

The difficulty comes in, of course, with the fact that people are quite good at deceiving themselves in these matters, and this is where the parallel with the legal discussions of *mens rea* is useful, where discussions of subjective and objective standards of assessment figure prominently (Alexander & Kessler, 1997). Consider Jane, whom the police arrest for driving a stolen car. Jane insists that she thought it was her car. At first blush, she is not likely to convince a jury to accept this and judge her innocent, unless it turns out that her identical new car was parked on the same street, in a town where everyone leaves the keys in the ignition. Then it becomes conceivable that what

she was doing was not actually stealing a car. It depends on whether she *could have known* that it was not her car and *should have paid closer attention*, say, to the fuzzy dice hanging from the rearview mirror. As Kathie Jenni has noted (2003: 281), "Humans' capacity to avoid unpleasant awareness is remarkable in its versatility." Thus, even if she honestly did not think of herself as stealing, Jane might have been *culpably* ignorant.

The same point holds for cases of procrastination. If Freddy delays starting work on a grant application because he genuinely believes that he "works better under pressure," it could be argued that he is not actually procrastinating but merely strategically delaying and thus has nothing to blame himself for. Whether this is the case, however, is decided neither by his conviction nor the objective results of his strategy but rather what he could have reasonably been held accountable for taking into consideration. For Freddy's delay to count as procrastination, it must be the case that he *could have known* that things were going to turn out worse (and also that he was engaging in delay). In other words, the unwarranted delay must be culpable, in the sense developed in the *mens rea* standard and elaborated further in contemporary work in "virtue epistemology" (for an overview, see Fairweather & Zagzebski, 2001).

Suppose that Freddy's "I-work-best-under-pressure" strategy is a colossal failure. The quality of his work suffers, and he consistently regrets boxing himself in with regard to deadlines. To determine whether he is procrastinating, we must ask whether he can be held responsible for not seeing these problems coming, especially if it happens repeatedly. And this is where the opportunity opens up for Freddy to *ignore* the evidence that suggests that the delay is not strategic but unwarranted. The issue comes back again to whether he could be reasonably considered to have a *mens rea*.

The parallel with self-deception underscores the point. For a cuckolded husband's belief in his wife's faithfulness to count as self-deception, what matters is not that his beliefs are objectively false—even if she's faithful, he might be diverting his attention from what he thinks is evidence—but rather that he participates in undermining the veracity of his self-knowledge. Similarly, in the case of procrastination, Freddy's delay counts as procrastination only if he is culpable for failing to see that the delay is unwarranted.

What is to be gained from this discussion of how to define procrastination? There are plenty of definitions of procrastination [see the papers in Andreou & White, 2010; see also the meta-analysis by Steel, 2007 and, for the most recent review (Haghbin, 2015), and I am not claiming here that "culpably unwarranted delay" is the only useful definition (see, on the

general futility of the search for a *single correct definition*, Anderson, 2014). My suggestion is merely that the definition developed here captures the sense in which procrastinators' own view of their behavior is partly constitutive of the behavior counting as procrastination. This duplicity toward oneself is a key aspect of the phenomenon, and crucially involves seeing what one is doing as a basis for judging oneself negatively. And this sense that procrastinators know themselves to be undermining themselves gets lost when it is suggested that procrastination can sometimes be a prudent or healthy strategy.

SELF-INDULGENT RECONSTRUALS

Once it is clear that procrastination, as culpably unwarranted delay, involves a *mens rea* (guilty mind), important aspects of the phenomenon and significant opportunities for intervention come into view. In particular, the suppression of negative self-assessment takes on an important role in explaining how people go ahead with procrastination. Since considering one's behavior to be unwarranted delay is a threat to one's positive self-appraisal and on the assumption that humans have a strong underlying desire to think well of themselves, those tempted to procrastinate have basically two options: procrastinate less or find some way of insulating oneself from the charge of procrastination. On the first scenario, we get the explanation of self-regulation in terms of being successfully motivated by the fear of loss to one's self-image. This is a massively significant source of norm-conforming behavior and self-regulation. People frequently avoid all sorts of problematic behaviors or persist with aversive tasks because they do not want to be a "quitter" or a "cheat" or a "coward" (see Heath, 2008a, especially Chapter 3 on "deontic constraint"; this is also part of a social psychological perspective presented in Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination, and which deserves much further study).

My focus, unsurprisingly, is on the second of these options, on the various ways in which procrastinators avoid the truth about what they are doing, a truth of which they are, at some level, aware. Procrastinators let themselves believe things that they know are not true. This is another way in which procrastination involves "giving in to feel good" (Sirois & Pychyl, 2013; Tice & Bratslavsky, 2000). By reconstruing the situation in a way that distorts it, procrastinators can preserve a positive self-appraisal. They can delay while still thinking that they are not one of those lazy people who

procrastinates all the time. If they are successful in this, they can develop a self-indulgent reconstrual that makes their delay appear reasonable, at least at some level. At the same time, like the cuckolded husband who keeps coming up with alternative explanations for his wife's absences and the scent of unfamiliar cologne, there is an unpalatable truth that procrastinators cannot entirely eliminate (*mens rea*), but are hell-bent on denying.

Compelling analyses of this self-protective strategy have been developed in the criminology literature on neutralization techniques (Copes, Vieraitis, & Jochum, 2007; Maruna & Copes, 2005; Sykes & Matza, 1957) and the social psychology literature on self-licensing (Blanken, van de Ven, & Zeelenberg, 2015; De Witt Huberts, Evers, & De Ridder, 2011), which examine ways of protecting one's positive self-image by providing an account of one's actions as justified or at least excused.[e] These techniques or strategies have a great deal in common with strategies found to reduce cognitive dissonance (e.g., Gosling, Denizeau, & Oberlé, 2006; see also Little & Pychyl, 2015; Sirois, 2004). In their pioneering work on neutralization theory, for example, criminologists Sykes and Matza identified five techniques that criminals uses to "neutralize" their actions: denial of responsibility, denial of injury, denial of victim, condemning the condemners, and appeal to higher loyalties. As Sykes and Matza emphasize, these self-serving reconstruals of the actions can be understood not only as a way of managing guilt afterwards but also as ways of neutralizing them in advance, dimming the light of one's conscience with

[e] There is some confusion generated by the term "justification" as it is used in the behavioral sciences. Ordinarily, when we say that someone is "justified" in believing something, we are saying that they have good reasons for believing it, at least on basis of the available evidence (Gettier, 1963). Scott & Lyman (1968) introduced a usage of "justifications" and "excuses" into the sociological literature (drawing on work of the philosopher of language and law J. L. Austin) that can be summarized as follows:

> [Justifications are] 'accounts in which one accepts responsibility for the act in question, but denies the pejorative quality associated with it' (Scott and Lyman, 1968:47). Conversely, with excuses, 'one admits that the act in question is bad, wrong, or inappropriate but denies full responsibility' (Scott and Lyman, 1968:47). In offering an excuse, one maintains that the deviant act was regrettable, but that it could not be helped (Copelton, 2007).

The terms were intended to refer to attempts to get others to accept the appropriateness of one's actions, rather than successful demonstrations of the appropriateness of one's actions. This is particularly important to keep in mind when discussing attempts to "justify something to oneself." One might very easily succeed in this task, even when it is decidedly not the case that one has justified the action, in the sense of having truly vindicated it on the basis of good reasons. This background provides another reason for preferring "unwarranted" over "unjustified" or "unexcused" in defining procrastination.

regard to actions that one is contemplating doing (Heath, 2008b). The criminals they discussed were particularly adept at reconstruing their transgressions in ways that rationalized them, explained them away, or relativized the amount of harm involved. As a result, the constraining reins of conscience were loosened, making it possible to give in to temptation without nearly as much guilt. And the key implication is that the more difficulty these criminals would have had in self-indulgently reconstruing the transgressions they contemplated as minor or excused, the stronger their incentive not to break the law.

Similar analyses have been developed in a wide range of other cases, including unethical consumption practices (Chatzidakis, Hibbert, Mittusis, & Smith, 2004) and overeating (De Witt Huberts et al., 2011). The term often used here is "self-licensing," which can also include cases in which one feels entitled to indulging in questionable activities because of having done something particularly virtuous. My interest here, however, is in the particular form of what one might term self-indulgent reconstruals, in which one develops an account of one's action that serves to make it appear justified or excused. And here, too, we would expect that the more difficult it is to succeed in licensing one's transgressions, the stronger their incentive to stick to one's best intentions.

EXTENDING THE WILL TO RESIST SELF-INDULGENT RECONSTRUAL

The foregoing suggests that a key determinant of whether people procrastinate will be whether they succumb to the temptation to self-indulgently reconstrue their unwarranted delay as either justified or excused. Seen in this way, successful self-regulation is likely to depend on the availability of opportunities for self-indulgent reconstrual and the extent of an individual's resources for resisting the temptation to engage in these strategies for neutralizing the thought that one is engaging in unwarranted delay. The point is subtle, since it operates indirectly, but the idea is that one can reduce procrastination by resisting the temptation to remove something that itself inhibits procrastination, namely, the awareness that what one is contemplating is indeed unwarranted delay.

One way in which research on procrastination can shed light on this is by identifying the skills, cognitive strategies, and personality types that enable individuals to effectively resist temptations to self-indulgently reconstrue unwarranted delay as something other than it is (for a review, see Steel, 2007;

Fujita, 2008). A good upbringing and a strong conscience are a big part of this. Conscientiousness or neuroticism are likely to have a significant impact on the willingness to resist such self-indulgent reconstruals, although these traits would work for and against the individual, respectively.

These internal psychological strategies are dependent on often-limited psychological resources (Baumeister & Tierney, 2011). My interest here, however, is in research on *structured* nonprocrastination, that is, on how the environment can be structured to facilitate self-regulation, in this case by strengthening individuals' capacity to resist inclination to self-indulgently reconstrue one's behavior as not *really* unwarranted delay. The idea is that once it becomes clear that a central dimension of procrastination involves self-indulgent reconstruals, it becomes clear that strategies designed to block the possibilities of reconstrual can count as effective means for reducing self-regulation failure. In other words, restricting possibilities for reconstrual helps potential procrastinators by keeping up the pressure to conform to what they know, at some level, to be true.

In earlier work, I have discussed "structures" of this sort in terms of various ways in which one's ability to engage in self-regulation is supported by features of the environment that "extend" one's will (Anderson & Kamphorst, 2015; Heath & Anderson, 2010). For example, if it is important to me to go for a run first thing every morning, I can increase my chances of success by laying out everything I need so that it is ready when I get up first thing in the morning and by subscribing to an afternoon rather a morning newspaper. Or if I know that I am going to be tempted to overeat at a holiday dinner, I can enlist the help of another guest to "run interference" for me when the hostess is putting pressure on me to eat or drink more. There are even more dramatic ways of using the environments as a precommitment mechanism, such as removing all alcohol from the house if one is struggling with an alcohol abuse problem (Elster, 2000; Schelling, 2006; Ariely & Wertenbroch, 2002).

In the "extended mind" literature (Clark & Chalmers, 1998; Clark, 2008), the central idea is that capacities that are usually thought to operate entirely "within the head" (e.g., doing arithmetic) can be partly carried out by processes that essentially involve being "coupled" with the environment (e.g., by using an abacus). The same point can be made for how one's "extended will" can resist the temptation to procrastination (Heath & Anderson, 2010) or, in the cases under discussion, to transform tendencies to engage in self-indulgent reconstruals of either the fact that one is delaying or, more frequently, the fact that the delay is unwarranted.

In developing an analysis of the capacity to resist the temptation to engage in procrastination-facilitating reconstruals that can be supported by scaffolding structures, the first step is to identify the internal capacities. The subsequent step is then to identify ways in which "coupling" with structure in one's environment enables greater success in resisting that temptation. In exploring these possibilities, I organize the discussion in terms of three broad areas: attention, motivation, and judgment. There are certainly other components of resisting self-indulgent reconstruals, but I focus on these three here, looking both at how structures can make accurate self-appraisal more attractive or can block the path to self-indulgent reappraisals.

In the next section, then, I provide several illustrations of how this analysis might work, both as a set of preliminary suggestions for how structures might support self-regulation in this particular way and as a hypothesis regarding the etiology of procrastination. Further empirical work needs to be done to validate the suggestions provided here.

STRUCTURES THAT SUPPORT ATTENTION, MOTIVATION, AND JUDGMENT

Attention

I begin with capacities for attention. One of the most straightforward ways in which procrastinators deceive themselves about their transgression is by putting it out of mind, or letting it slip out of mind. Although it certainly happens that people genuinely forget about an intended task, procrastinators are best thought of as having a more complex awareness of the task. Given the requirement of *mens rea*, they are conscious, at some level, of the commitment and the deadlines, and one of the main challenges lies in finding a way to resist or block the temptation to ignore the evidence. The capacity for focused attention, then, is crucial in keeping the tasks "before one's mind," something that is particularly difficult when one is ego-depleted (e.g., Baumeister, 2002). This applies to everything from the basic awareness of how much time remains before a deadline to an ability to track multiple tasks in a complex project.

The structures that can buttress our attention are diverse, and many are very familiar. By placing clocks, calendars, and datebooks clearly within view, we can make it more difficult to fool ourselves about whether or not we are delaying. These may seem like trivial examples, but their role is profound, particularly once it becomes clear that they function only in combination with a sufficiently specific schedule of the task (Lay, 2014).

To perceive the relevance of what the clock reveals, it often helps to have a rather specific point in time already worked out. The greatest possibility for making improvements here, however, likely lie with the specificity of the time for initiating various activities and a schedule for each step of the complex process. This is a point that is well known to anyone involved in planning large-scale projects; staying on track crucially involves working out in advance what the component parts are within a complex project and what the specific milestones are along the way. In this way, formulating specific plans is part of the preparatory process by which individuals can buttress their attentional resources.

Consider, for example, Lay's (2014) recent discussions of scheduling. The better one's capacities of judgment in setting schedules and deadlines for oneself, the more one can avoid situations of inappropriately unclear deadlines. As Bratman (1987) emphasizes in his discussion of the planning theory of agency, plans need to have a degree of flexibility under changing circumstances, but it is also the case about settling on clear deadlines and tasks for when one intends to be completing tasks helps to avoid opening up the problematic flexibility that can open the door to reconstruing delay as something other than that.

To take an illustration from the context of health, consider Gary, who has noticed that he has been getting colds quite frequently and thinks that it would be good to make an appointment with a primary care physician soon to get some medical tests done. And yet, he finds himself putting it off. Gary thinks of himself as conscientious and certainly not someone who would fail to take care of himself, particularly given that he has a young family. As he considers, at a certain point, whether to phone the doctor or put it off for a day, the lack of specificity in his intention affords him plenty of wiggle room for thinking that he is still going make the appointment "soon" [see Stroud's (2010) discussion of "anemic intentions"]. In such contexts, by entering into his calendar a specific time for making the call and an automatic reminder, Gary can create an attentional structure that makes it difficult from him to overlook the fact that failing to make the call at the appointed time is a case of delay.

The recommendation that flows from this discussion is clear: Resisting the temptation to self-indulgently reconstrue one's procrastination calls for preparing structures that steer one's attention toward the tasks and away from distractions. This is easier said than done, and there is a strong temptation to engage in "second-order procrastination," that is, to procrastinate about taking steps to reduces one's procrastination (Andreou, 2007;

Anderson, Kamphorst, Nauts, Kroese, & De Ridder, 2015). Moreover, insofar as performance on a task is impeded by the emotions generated by a constant confrontation with the deadline, one may need to establish an "oasis" in which to do the work, especially in the case of creative work (for an unusual but invaluable source on the idea of a "tortoise enclosure" for creative work, see Cleese, 1991; see also Dini, 2014). But this is a very risky strategy unless one has a reliable way of returning one's attention to the deadline at the appropriate point in time. Recent work on e-coaching and automated reminders provide a promising way of developing external structures that allow one to meet the need for "slack" time by establishing an agent that will return one's attention to the relevant task at a preappointed time (on e-coaching, see Kamphorst, 2011).

Motivation

This discussion of the need for "slack" already introduced the important dimension of motivation. To resist the temptation to neutralize the negative self-appraisal associated with acknowledging that one is procrastinating, one also needs to be sufficiently motivated. The stronger our motivation to be honest about whether or not we are procrastinating, the less likely we are to engage in self-indulgent reconstrual. Goals and values play a central role in motivating individuals to overcome aversions to performing certain tasks (Gollwitzer & Brandstaetter, 1997; Oettingen & Gollwitzer, 2011), and the same can be expected for being willing to be honest with oneself about one's unwarranted delay. The more Gary dislikes the thought of himself as lying to himself, the stronger his motive to resist the temptation to deceive himself. But motivation often flags for a variety of reasons, including negative affect, ego-depletion, or lack of self-efficacy. Sometimes we just have trouble facing unflattering truths about ourselves or about the scope of the extent to which there is no real urgency about a looming deadline. The better one's ability to cope with these factors, the better one will be able to resist the temptation to deceive oneself about one's unwarranted delaying. There are numerous psychological strategies that can help us counter flagging motivation to be honest with ourselves. Many of the factors relevant here are familiar from other contexts: mindful self-compassion (Sirois, 2014; Wohl, Pychyl, & Bennett, 2010) is a good example of a motivational strategy that contributes to a willingness to face the emotionally difficult fact that one is limited in the possibilities for counting what one is doing now as a matter of being on time (see also Chapter 8, Procrastination, Emotion Regulation, and Well-Being).

Various strategies can help here, including "structural" approaches that rely on a supportive "coupling" of one's self-regulation and the environment. Perhaps the most straightforward environmental approach is to manipulate the environment so as to reduce the load on self-regulation resources (Baumeister, 2002; Mischel & Ayduk, 2004; Parks-Stamm & Gollwitzer, 2009), thereby leaving one better positioned to overcome both the aversiveness of the task being delayed *and* the aversiveness of the unflattering truth about one's procrastination. Similarly, on the assumption that capacities for emotion regulation are important not only for facing aversive tasks (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being) but also the unpleasant recognition that delay would be unwarranted, structural supports are promising that allow one to engage in emotion regulation with confidence. One structural strategy with a particularly daunting task can be to build up to it by first developing mastery about more doable tasks (Bandura, 1995). In the case of self-indulgent reconstruals, this could involve practice in being more honest with oneself about trivial matters, perhaps by having a friend or therapist set up a series of tasks to gain a sense of self-efficacy in being honest with oneself.

Yet another strategy involves incentives and precommitments centered not on the dilatory behavior but the self-indulgent reconstruals (Elster, 2000; Schelling, 2006). Gary could, for example, give his office mate a stamped, pre-addressed envelope with a contribution to a political cause he opposes with the agreement that it will be posted unless Gary reports back the next day at noon regarding what steps, if any, he made towards setting up an appointment. The point here is not just that this creates an incentive to make the appointment, but also an incentive to be up-front about what one has done, with the understanding that he had better have a genuine excuse or justification for not yet having made the appointment. Such wagers may serve to turbocharge one's motivation not to be self-indulgent.

Judgment

Finally, since self-indulgent reconstruals are often a matter of allowing oneself to engage in cherry-picking the evidence and reasoning fallaciously about it, one can reduce the temptation to rationalize one's procrastination by supporting one's powers of good judgment. It is also not always obvious why a bit of delay would really be so unwarranted, and in the end-of-the-day fog of mental fatigue and a couple glasses of wine, one may have trouble feeling the force of the evidence for why the delay would be problematic. Given this, I offer three strategies for scaffolding one's powers of judgment and cognition.

First, there are structural strategies that focus on facilitating access to the reasons why delay would be unwarranted by overcoming biases that tend to feed into self-indulgent reconstruals. A good example here comes from attempts to overcome the tendency to hyperbolically discount the impact our choices will have on our future self. There are a variety of promising strategies for visualizing the impact of one's choices on one's future self and for strengthening one's connection to the perspective of one's future self, including photoaging (Hershfield, 2011), vivid mental imagery (Blouin-Hudon & Pychyl, 2015), temporal landmarks (Peetz & Wilson, 2013), psychological distancing (Trope & Liberman, 2010), and using bright lines to strengthen the bargaining position of the future self (Ainslie, 2001).

A similar point holds for navigating complex projects or multiple tasks, where the difficulty in holding present in mind the rationale for the specific sequence of doing something makes it particularly easy to slip into thinking that one perhaps is not really delaying. Numerous tools can help one to figure out effective ways of structuring a task to achieve a task-supporting level of specificity. For example, if Gary has to set up a series of treatment regimes and appointments for himself in the wake of a cancer diagnosis, it will be useful to do this in a way that allows him to be able to understand clearly and quickly, especially when under cognitive load or when emotionally, volitionally, or motivationally depleted, what tasks need to be accomplished and when specifically. In this sense, structures that go into and support the process of determining deadlines are part of the structures that can help to reduce procrastination.

Second, there are accountability procedures one can establish to block rationalizations. By establishing a routine of regularly and explicitly reviewing his or her priorities and commitments (see Allen, 2015)—especially with a neutral interlocutor—one puts in place a procedure, supported by habits and social pressure, during which it is difficult to engage in self-indulgent reconstruals.

Third, perhaps most speculatively, reducing the prevalence of neutralizing scripts and expectations in the culture or one's peer group can be expected to have a significant effect. The stories we tell ourselves about typical courses of action function as affordances that facilitate enacting them (Hutto, 2008). Thus, as Baumeister has emphasized (Baumeister & Tierney, 2011), a culture that places a high value on self-control and willpower makes it much more difficult to slack off or, in terms of the present discussion, to get away with self-indulgent reconstruals. And this puts the talk of purportedly healthy or positive forms of procrastination in a new light. The notion

that procrastination can be seen as an effective strategy, as talk of "active" or "structured" procrastination suggests, functions as a facilitating cultural affordance for self-licensing and neutralization techniques, further contributing to the persistence of patterns of procrastination.

CONCLUSION

In this chapter, I have argued that we should define procrastination as "culpably unwarranted delay," that is, as choosing to put a task off to a later point in time, even though there are overriding, good reasons not to put things off, and there are no circumstances that excuse one either for failing to appreciate these reasons or for failing to act. Emphasizing the *mens rea* aspect of procrastination in this way opens up possibilities for strategies for reducing procrastination by establishing structures that counteract one's temptation to engage in self-indulgent reconstruals of one's procrastination.

More research is clearly needed in this vein. For example, more work is needed on separating out the effects of *the failure to resist reconstrual* and *the failure to resist delay*. But conceptually, it is clear that these are distinct. My role as theorist in this regard is to hypothesize something that would ultimately have to be demonstrated empirically. And even the theoretical points made here would benefit from further elaboration.

Let me conclude by anticipating a likely objection that my emphasis here on blocking self-indulgent reconstruals can sound like a particularly uncompassionate, old-school approach to procrastination. But it is crucial to distinguish providing support from providing comfort. Protecting people from the truth is patronizing, and it is unclear why this should not also be true of facilitating others' efforts at self-deception. Look at it this way: If your friends are lying to themselves in ways that undermine themselves, do the duties of friendship require that you assist them in their efforts at deceiving themselves or, rather, that you make it more difficult for them to succeed in undermining themselves?

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CHAPTER 4

Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective

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INTRODUCTION

The omnipresence of the media's message about the benefits of managing stress, eating healthy, and getting regular physical activity, and the often dire health consequences of not doing so, are hard to escape in today's modern life. Whether in the form of public service messages, the latest medical evidence, or advertising for quick weight loss products, this collective knowledge highlights the importance of making healthy lifestyle choices to help maintain a healthy weight and live a simpler, more stress-free life to reduce the risk of developing any one of a number of chronic diseases. Stress, physical inactivity, and an unhealthy diet are implicated in the development and exacerbation of a host of major chronic diseases, such as heart disease, diabetes, arthritis, and certain cancers, in part through their contribution to the development of obesity (World Health Organization, 2011). Such chronic health conditions can take a substantial toll on quality of life by impairing daily functioning through pain and other functional limitations, and in some instances even lead to early mortality. However, it is in the context of a chronic health condition that maintaining a healthy lifestyle and managing stress become that much more important for managing symptoms and minimizing the risk of disease progression or complications.

Despite knowing the importance of these behaviors for lifelong health, many people find it difficult to follow through with them. Temptations and competing activities that promise immediate rewards, but may have long-term costs to health, can feed a temporal shortsightedness that results in procrastination of these important health-promoting and maintaining behaviors. And, when procrastination becomes a characteristic way of dealing with tasks deemed to be unpleasant, challenging, or uninteresting, this *temporal myopia* may set in. Consequently, the practice of such behaviors may be

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more routinely "put off" in favor of immediately enjoyable activities, with cumulative negative effects on health (World Health Organization, 2011). Add to this an unhealthy dose of stress and negative emotions associated with the repercussions of habitual procrastination across any tasks (Flett, Blankstein, & Martin, 1995; Lay, 1994; Sirois, 2007, 2014b), and you have an unfortunate recipe for the potential development of chronic health issues.

In this chapter, I explore how the temporal myopia associated with procrastination contributes to a pattern of reacting and behaving that creates vulnerability for the development of several chronic diseases. After establishing the links between procrastination, stress, health, health behaviors, and health as proposed by the procrastination-health model (Sirois, 2007; Sirois, Melia-Gordon, & Pychyl, 2003), I outline a temporal extension of this model that can serve as a guiding conceptual lens from which to better understand how procrastination may create vulnerability for chronic illness. From the perspective of this extended model, I highlight four potential pathways through which procrastination can have a negative and cumulative effect on physical health over time and outline the role of temporal myopia in each of these routes. Next I present evidence suggesting how procrastinators' characteristic ways of responding can further compromise healthy adjustment and disease management in individuals already living with chronic disease, and the subsequent downstream effects on health and well-being. This chapter concludes with a discussion of potential future directions in procrastination research to better understand and address these issues in order to alleviate the potential long-term health consequences of procrastination.

PROCRASTINATION-HEALTH MODEL: CURRENT EVIDENCE AND EXTENSIONS

Much of the initial research into the relations between procrastination and health was guided by the procrastination-health model (Sirois, 2007; Sirois et al., 2003). Inspired by an initial longitudinal study by Tice and Baumeister (1997), which noted associations of procrastination with stress and poor health in students across the academic term, the procrastination-health model aimed to better explain these associations as well as provide a conceptually driven blueprint for understanding the potential negative consequences of procrastination for health-related outcomes.

Building on models linking personality to health in general (Friedman, 2000; Smith, 2006; Suls & Rittenhouse, 1990), the procrastination-health

model proposed by Sirois and colleagues (Sirois 2007; Sirois et al., 2003) posits that trait procrastination confers risk for poor health-related outcomes through a *direct*, stress-related route and an *indirect*, behavioral route. The use of *direct* here refers to the idea that the activation of physiological systems related to the stress response can have a direct role in the development of physical health issues. The stress response creates potential risk for poor physical health via the activation of the hypothalamic–pituitary–adrenocortical (HPA) system and the subsequent release of cortisol (also known as, the stress hormone), suppression of immune system response and functioning, which creates increased risk of infections, and autonomic nervous system arousal, which can elevate heart rate, increase muscle tension, and disrupt digestive functioning and sleep (Leger, Charles, Ayanian, & Almeida, 2015). In contrast, the *indirect* route highlights the role of health behaviors, which can be viewed as being more indirectly linked to the development of illness because poor health behaviors over time are known to increase the risk of disease, especially in those who are vulnerable to its development (World Health Organization, 2011). For example, eating unhealthy fast food and junk food may not necessarily make you immediately ill, but if done on a regular basis, could lead to digestive issues in those who have preexisting genetic weaknesses that make them more prone to these issues.

Over a decade of research has for the most part borne out the predictions of this model. As illustrated in Table 4.1, a number of studies now indicate quite unequivocally that procrastination is related to higher levels of stress across both student (Flett, Stainton, Hewitt, Sherry, & Lay, 2012; Jackson, Weiss, & Lundquist, 2000; Sirois et al., 2003; Sirois & Tosti, 2012; Stead, Shanahan, & Neufeld, 2010; Tice & Baumeister, 1997), and community adult samples (Sirois, 2007; Sirois & Kitner, 2015; Sirois & Stout, 2011). There is also an emerging literature noting the links between procrastination and less frequent practice of, or intentions to engage in, health-promoting behaviors such as healthy eating, physical activity, and healthy sleep behaviors (Kroese, De Ridder, Evers, & Adriaanse, 2014; Sirois, 2004, 2007; Sirois et al., 2003), all known modifiable risk factors for the development of a number of chronic diseases (World Health Organization, 2011).

Research on how procrastination may be linked to physical health is sparser still, although there a couple of noteworthy examples. For example, Tice and Baumeister (1997) found that students categorized as procrastinators according to their scores on Lay's General Procrastination Scale (GPS; Lay, 1986) reported a larger number of physical symptoms toward the end of term in comparison to nonprocrastinators. Other studies using

Table 4.1 Overview of the research to date examining the relation of procrastination to stress, health behaviors, and physical health as proposed by the procrastination-health model

Study	Sample	Design	Findings	Health-related outcomes
Sirois (2014a, 2014b)	4 samples: 145 undergraduates, 339 undergraduates, 190 undergraduates, and 94 community adults	Cross-sectional surveys	Procrastination was associated with higher stress across all four samples. Lower levels of self-compassion mediated the procrastination-stress link in all four samples.	Stress
Sirois and Kitner (2015)		Meta-analysis; cross-sectional surveys	Procrastination was associated with greater use of maladaptive coping strategies, and less use of adaptive strategies. Procrastination was associated with higher stress in all four samples. Maladaptive coping mediated this link in all samples.	Stress, coping
Stead et al. (2010)	200 undergraduate students	Cross-sectional survey	Procrastination (GPS, PASS) were each associated with greater daily stress severity.	Stress
Flett et al. (2012)	110 graduate students	Cross-sectional survey	Procrastination cognitions (PCI) were associated with greater graduate student stress.	Stress
Jackson et al. (2000)	173 undergraduate students	Longitudinal	Procrastination (Tuckman scale) was associated with higher stress at both Time 1 and Time 2	Stress
Tice and Baumeister (1997)	57 students	2 time-point longitudinal survey across the academic term	Procrastination (GPS) was associated with lower stress and less illness early in the semester, but higher stress and more illness late in the term, and more medical clinic visits.	Stress, physical health symptoms, medical care seeking

Sirois and Stout (2011)	599 nurses	Cross-sectional survey	Procrastination was associated with higher stress, poor self-rated health; stress mediated the procrastination-health relationship	Stress, self-rated health
Sirois and Tosti (2012)	339 undergraduate students	Cross-sectional survey	Procrastination (GPS) was associated with higher stress, poor self-rated health (SRH); low mindfulness mediated the procrastination-stress link.	Stress, self-rated health
Sirois et al. (2003)	122 undergraduate students	Cross-sectional survey	Procrastination (GPS) was associated with higher stress, fewer health-promoting behaviors, treatment delay, and a greater number of acute health problems. Stress mediated the procrastination-illness link.	Stress, health-promoting behaviors, treatment delay, acute health problems
Sirois (2007)	254 community adults	Cross-sectional survey	Procrastination (GPS) was associated with higher stress, fewer health-promoting behaviors, less frequent dental and medical check-ups, and a greater number of acute health problems. Stress mediated the procrastination-illness link.	Stress, health-promoting behaviors, dental and medical check-ups, acute health problems
Sirois, Voth, and Pychyl (2009)	365 undergraduate students	3 time-point longitudinal survey across the academic term	Procrastination (GPS) was associated with higher stress, less frequent health behaviors, and a greater number of acute health problems at each of the 3 time points.	Stress, health behaviors, acute health problems

(*Continued*)

Table 4.1 Overview of the research to date examining the relation of procrastination to stress, health behaviors, and physical health as proposed by the procrastination-health model *(cont.)*

Study	Sample	Design	Findings	Health-related outcomes
Sirois (2004)	182 undergraduate students	Retrospective recall of past illness and ameliorative health behaviors	Procrastination (GPS) was associated with weaker intentions to engage in self-chosen health-promoting behaviors; self-efficacy mediated this link.	Health-behavior intentions
Sirois, Shucard, and Hirsch (2014)	Study 1: 657 community adults	Cross-sectional survey	Procrastination (GPS) was associated with less frequent health behaviors; this link was mediated by feeling less emotionally close to the future self.	Health behaviors
Sirois et al. (2014)	Study 2: 120 community adults	Cross-sectional survey	Procrastination (GPS) was associated with less frequent health behaviors; this link was mediated by low future orientation and positive affect, and high negative affect.	Health behaviors
Chapter 7, The Relation Between General Procrastination and Health Behaviors: What Can We Learn from Greek Students?	141 Greek students	Cross-sectional survey	Procrastination (GPS) was not significantly associated an overall measure of health behavior frequency; however, it was correlated with drinking more coffee and tea, eating less fruits, and more precooked/frozen meals.	Health behaviors
Sirois (2015)	846 community adults; 182 with hypertension/cardiovascular disease (HT/CVD); 564 healthy controls	Cross-sectional survey	Procrastination (GPS) was associated with HT/CVD after controlling for demographic and higher order personality factors.	HT/CVD, coping

a physical health problem checklist, which is arguably less biased to self-reporting errors than symptom checklists (Sirois et al., 2003), has similarly found that procrastination is associated with a greater number of acute health issues than one would expect to be linked to stress such as headaches, insomnia, flus and colds, and muscle strains (Sirois, 2007; Sirois et al., 2003). Finally, at least two studies have noted that procrastination is linked to poor self-rated health (Sirois & Stout, 2011; Sirois & Tosti, 2012), using a well-validated measure of global health that is known to be a reliable indicator of objective health status and health-related outcomes including cortisol responses to stress, morbidity, and mortality (Jylhä, 2009; Kristenson, Olsson, & Kucinskiene, 2005; Mora, Orsak, DiBonaventura, & Leventhal, 2013; Tamayo-Fonseca et al., 2013). Collectively, this growing body of research on the potential health effects of procrastination provides support for each individual path in the procrastination-health model.

But is there research linking these effects? Research specifically testing the indirect and direct routes of the procrastination-health model (and therefore linking these health effects) is less abundant, but does support the proposed pathways from procrastination to poor health. The original tests of the procrastination-health model found clear support for the role of stress, and mixed support for the role of health behaviors in explaining why procrastination may confer risk for poor health. In the first test using a student sample, stress but not health-promoting behaviors explained why procrastinators experienced a greater number of health problems, despite the fact that procrastination was negatively associated with health behaviors (Sirois et al., 2003). One explanation given for this finding was that the relative youth of the sample made them resilient to the effects of poor health behaviors, which tend to have a more cumulative than immediate effect on health. In contrast, the effects of stress can manifest relatively quickly given the psychophysiological changes that occur. In a follow-up replication study which sought to address this issue by replicating the initial study with a sample of community adults who were a bit older, the results provided clearer evidence of a role for health behaviors. Using more sophisticated statistical techniques than simple mediation, the replication study found that stress and poor health behaviors each significantly explained the link between procrastination and illness when tested separately (Sirois, 2007). However, when stress and health behaviors were tested simultaneously, only stress explained the procrastination-health relationship owing mainly to the strong negative association between stress and health behaviors. Although the participants in this study were comparatively older than the students

from the first study, it may be that again the proximal effects of stress outweigh the more distal effects of health behaviors.

Aside from these two original tests of the model, there are only three other studies that have tested the procrastination-health model, and specifically the direct pathway linking procrastination to health. Stress explained the link between procrastination and self-rated health in a large sample of students (Sirois & Tosti, 2012), and in a large sample of nurses (Sirois & Stout, 2011). In another study, stress also explained the link between procrastination and poor sleep quality, a very specific physical health outcome that is associated with poor health (Sirois,Van Eerde, & Argiropoulou, 2015).

What becomes clear from this body of work is that when procrastination is examined with respect to acute or transient physical health issues, the direct, stress-mediated route appears be more robustly implicated in explaining why chronic procrastination may result in poor physical health. In some ways, this is to be expected if we consider that the original model was designed to understand the processes involved in the development of more short-lived or acute health problems, which are more likely to include stress as a proximal causal factor. Nonetheless, recent evidence from a population-based study indicates that even relatively temporary or acute physical health symptoms and problems that occur on a daily basis predict poor health functioning 10 years later (Leger et al., 2015), calling into question the apparent *short-term* effects of procrastination for physical health.

In the next section, I propose and outline a temporal extension to the procrastination-health model that addresses the issue of the proximal versus distal effects of stress and health behaviors, and which highlights four potential pathways to explain the short- and long-term implications of procrastination for physical health. Relevant for our discussion of procrastination and chronic illness, this new extended model also addresses the issue of the potential cumulative and negative effects of procrastination for health.

TEMPORALLY EXTENDING THE PROCRASTINATION-HEALTH MODEL

A key consideration for understanding the potential short- versus long-term effects of procrastination for physical health from the lens of the procrastination-health model is whether procrastination itself is an occasional and isolated behavior, or one that is more chronic and pervasive. For the most part, this distinction reflects the differences between what researchers refer to as *situational* versus *dispositional* procrastination. In the

case of the former, procrastination may happen occasionally for those tasks which are viewed as overwhelming, challenging, or just plain uninteresting, and may be restricted to a particular domain such as work life or health. For example, Matthew may be especially prompt when it comes to paying bills, returning phone calls, and going to the gym regularly to stay fit. But when it comes to getting his reports in on time at work, he occasionally leaves them to the last minute, mainly because he greatly dislikes writing reports. Here the aversiveness of writing reports is what may drive him to procrastinate on this particular task, something which is common in most instances of procrastination (Blunt & Pychyl, 2000). How often he procrastinates on this task may also be a function of how writing reports fits within the ecology of the other tasks that he needs to get done, since writing reports may look relatively more or less aversive compared to other tasks on any given day. In these respects, Matthew's procrastination of writing necessary reports for work can be viewed as *situational*, in that, under certain circumstances, he is more likely to procrastinate on particular tasks, but not on others. If, however, Matthew routinely procrastinates not only writing reports, but also answering emails, keeping his house clean, and going to the gym, as well as on any other necessary and intended task that he finds difficult or too challenging, then his procrastination would be viewed as *dispositional* as it is a more characteristic way of responding to unpleasant or aversive tasks. The most common measure used by researchers to assess this more enduring or chronic form of procrastination is Lay's General Procrastination Scale (GPS; Lay, 1986).

As I discuss shortly, the distinction between situational and dispositional procrastination can translate into some very real differences in terms of the ramifications for health-related outcomes. Yet, the original procrastination-health model does not explicitly address this distinction. One way to understand how situational versus dispositional procrastination may relate to different health outcomes is to view each as having *specific* versus *nonspecific* effects with respect to procrastination. Here the term *specific* refers to those effects which are related to specific instances of procrastination, such as putting off writing a report, or going to the gym. In this respect, *specific* reflects the potential effects of situational procrastination on health in contrast to chronic or dispositional procrastination, which can be viewed as having a more generalized or *nonspecific* effect on health.

Mapping these dimensions onto the procrastination-health model, the effects of procrastination on health can be viewed as part of a 2 × 2 temporal model, which crosses the direct and indirect pathways with specific

Table 4.2 A 2 × 2 temporal model of the proposed effects of procrastination on health

Type of effect	Type of pathway	
	Direct	**Indirect**
Specific (situational and trait procrastination)	Stress associated with procrastination of a specific task or domain specific tasks (e.g., academic tasks, work-related tasks). *Health effects*: short term; acute health problems (e.g., infections, headaches, insomnia, gastrointestinal issues, etc.).	Failing to follow through with intended and specific health behaviors (e.g., health procrastination of diet and exercise goals). *Health effects*: unknown; may be few if any noticeable health effects, except among those with existing health conditions.
Nonspecific (trait procrastination)	Chronic stress associated with chronic procrastination. *Health effects*: long term; potential to develop chronic diseases and health issues associated with chronic stress such as inflammatory response dysregulation, chronic HPA activation, immunocompromise.	Generalized pattern of poor health behaviors associated with higher stress and compromised self-regulation resources. *Health effects*: long term; potential to develop chronic diseases and health issues associated with obesity, physical inactivity, poor heart health, and sleep insufficiency resulting from a longstanding pattern of poor health behaviors.

and nonspecific effects to account for both the proximal and distal effects of procrastination on health (Table 4.2). This model results in four potential ways in which procrastination may impact health both more immediately and over time.

In some ways, the distinction between situational and dispositional procrastination with respect to the proposed specific effects is perhaps arbitrary. If someone chronically procrastinates, then they are more likely to also procrastinate in certain domains such as health. Their procrastination could therefore have both specific and nonspecific effects, depending on the time frame that was used to observe these effects. As was the case with the original testing of the procrastination-health model, the health effects

of trait procrastination were examined over a briefer temporal horizon and therefore appeared as acute or transient health effects such as colds, flus, headaches, and the like. If, however, we examine the health effects of trait procrastination over a more extended time frame, then more serious and longer lasting health effects could potentially be observed as the cumulative negative consequences of chronic stress and an ongoing pattern of poor health behaviors begin to manifest. This is why the proposed specific effects of procrastination may be due to either situational or trait procrastination.

Accordingly, the *specific-direct* and *specific-indirect* pathways are essentially the routes originally proposed by the procrastination-health model, which links procrastination to acute health issues via stress and health behaviors, respectively (Table 4.2). As noted, the original model did not distinguish between situational and depositional procrastination, although in practice it was tested primarily with trait measures of procrastination. Of the two proposed routes related to specific effects, there is far more support for the specific-direct route than there is for the specific-indirect route. There are now at least five studies (described previously and detailed in Table 4.1) that provide supportive evidence for the role of stress in explaining the link between procrastination and poor physical health (Sirois, 2007; Sirois et al., 2003, 2015; Sirois & Stout, 2011; Sirois & Tosti, 2012). Despite the fact that there are a handful of studies noting that procrastination is associated with less frequent practice of health-promoting behaviors, there is only one study that supports a potential role for health behaviors in explaining why procrastinators may experience poorer physical health, and only when the effects of stress are not taken into account (Sirois, 2007). Accordingly, and as noted in Table 4.2, there may be few if any specific-indirect effects of procrastination on physical health in the short term, since poor health behaviors tend to have a more cumulative effect on health and, therefore, take time before their effects manifest in otherwise healthy individuals. This, however, may not necessarily be the case for those with preexisting health issues.

The *nonspecific-direct* and *nonspecific-indirect* effects reflect a temporal extension to the original procrastination-health model that accommodates the possibility that dispositional or trait procrastination may have cumulative and negative effects on health over time (Table 4.2). If we widen the temporal lens of the original model to view stress and poor health behaviors as occurring not just over a brief period of time but repeatedly over a longer time frame, then it is quite possible that these patterns of responding will have some very real and potentially long-lasting and serious ramifications for physical health.

With respect to the *nonspecific-direct* effects, there is little or no research to date providing evidence that procrastination is associated with chronic stress. This is due primarily to a lack of long-term longitudinal studies on procrastination and health. In principle, however, there are a number of reasons to expect that procrastination may be linked to the experience of chronic stress. For example, it is hard to imagine being relaxed and not stressed with a constant backlog of important but as yet unfinished tasks lurking in the background. In addition, there is a burgeoning body of research demonstrating that procrastination is linked to responding to stressors and perceived failures (including procrastination itself) in ways that may exacerbate stress or potentially generate stress. In particular, this research suggests that trait procrastination is associated with a tendency toward negative and often harsh self-evaluations (Flett et al., 1995; McCown, Blake, & Keiser, 2012), which can be a self-generated source of stress. These negative self-evaluative thoughts resemble a type of ruminative thinking that includes self-blame and brooding about past procrastination, that occurs frequently, and thus reflects a relatively stable tendency to engage in negative automatic thoughts about the self (Stainton, Lay, & Flett, 2000). Importantly, these procrastinatory thoughts have been linked to elevated levels of stress (Flett et al., 2012). Along similar lines, research has demonstrated that trait procrastination is associated with low levels of mindfulness and self-compassion (Sirois, 2014b; Sirois & Tosti, 2012), reflecting a tendency to be self-critical and self-judgmental. Of particular relevance for our discussion of stress, low levels of self-compassion were found to mediate the link between procrastination and stress across four samples (Sirois, 2014b), attesting to the role of negative self-evaluations in the generation of stress for procrastinators. Finally, a meta-analysis of 15 samples including over 4300 participants found that trait procrastination was associated with using maladaptive coping strategies, including self-blame coping, for dealing with stress (Sirois & Kitner, 2015). Notably, separate analyses of four samples also revealed that the greater use of maladaptive coping strategies explained in part why procrastinators reported experiencing higher levels of stress.

One common thread among these *stressogenic* factors is that each can be viewed as a relatively enduring response to challenges and failures, and procrastination itself. To the extent that this is true, then it may be expected that the stress associated with trait procrastination will be chronically activated to a greater or lesser degree because the appraisal and response patterns that typify this trait serve to exacerbate rather than ameliorate any stress that is experienced. In the case of self-compassion, lack of self-kindness and harsh

self-judgments about one's procrastinating can serve as an additional source of stress. Collectively, this research builds a plausible case for trait procrastination as an enduring and characteristic way of behaving and responding to challenges that is likely associated with chronic stress.

This proposition has some very important ramifications with respect to the health of people who chronically procrastinate. It is now fairly well established that chronic stress results in a number of significant physiological and neuroendocrinological changes that can have far-reaching and harmful consequences for physical health. For example, chronic stress is a contributing factor to the development and exacerbation of illness and disease via its negative impact on the immune system, and through its contributions to the dysregulation of inflammatory processes, both of which are known precursors of major chronic diseases such as diabetes, cardiovascular disease, and arthritis (Cohen et al., 2012; Juster, McEwen, & Lupien, 2010; McEwen, 2007). Chronic stress is also linked to overactivation of the hypothalamic–pituitary–adrenal (HPA) axis (one of the major human stress response systems), which can result in compromised functioning of the HPA (O'Connor, O'Halloran, & Shanahan, 2000), and subsequently contribute to illness-related symptoms in certain conditions such as chronic fatigue syndrome (Luyten, Van Houdenhove, Cosyns, & Van den Broeck, 2006). When considered in light of the previous arguments that procrastination is linked to chronic stress, this evidence paints a fairly grim portrait of the potential long-range physical health consequences of trait procrastination.

Turning to the *nonspecific-indirect* effects, there is similarly a lack of direct evidence that procrastination is associated with a chronic pattern of poor health behaviors. One piece of evidence that hints at this possible connection comes from a three time-point longitudinal study of undergraduate students across the academic year. At each assessment, trait procrastination, as assessed by the GPS, was negatively associated with less frequent practice of health-promoting behaviors (Sirois, Voth, & Pychyl, 2009). Although it could be argued that being in a college environment may facilitate such poor health behaviors, the health-behavior patterns established during times of transition, such as during emerging adulthood (young adults aged 18–25; Taylor & Sirois, 2014), may set the stage for a lifelong pattern of health behaviors (Goldstein, Xie, Hawkins, & Hughes, 2014).

Although limited, research into why trait procrastination is associated with fewer health behaviors has revealed two contributing factors that underscore the potential for a more enduring pattern of poor health behaviors. In one study, lower health-related self-efficacy, that is feeling less confident

in being able to take care of one's health, explained the weaker intentions of procrastinators to engage in health-promoting and protective behaviors that they themselves had identified as being important for preventing a repeat of a recent illness they had experienced (Sirois, 2004). This finding is consistent with health-behavior change theory, which indicates that perceived control is an important precursor of both heath-behavior intentions and behavior (Ajzen, 1985, 1991). In another study, feeling disconnected from a future self explained why procrastinators engaged in fewer health-promoting behaviors (Sirois et al., 2014). The notion that procrastinators have difficulty connecting with the future is perhaps best demonstrated by a recent meta-analysis, which found that across 14 samples including over 4300 participants, procrastination was robustly and negatively associated with a future time perspective (Sirois, 2014a). Given that future orientation is a key predictor of health-promoting behaviors (Joireman, Shaffer, Balliet, & Strathman, 2012; Sirois et al., 2014; Strathman, Gleicher, Boninger, & Edwards, 1994), in part because such behaviors necessitate focusing on distant rather than more immediate outcomes, it becomes clear why procrastinators may have difficulty following through with engaging in behaviors that promote good health. To the extent that both self-efficacy and future orientation are more enduring qualities, then again it is reasonable to expect that trait procrastination will also be associated with a more enduring tendency to engage in fewer health-promoting behaviors over time.

As is the case with chronic stress, a chronic pattern of poor health behaviors can have far-reaching and negative effects on physical health over time. Indeed, health-promoting behaviors are often referred to as modifiable risk factors simply because their contribution to the prevention of disease development and the maintenance of lifelong health is so significant. It is now widely recognized that unhealthy diet and a lack of physical activity increase risk for the development of number of major chronic diseases (World Health Organization, 2011). Not only do these poor health behaviors directly cause weight gain, which can lead to obesity, but they can compromise heart health. Recent research also adds poor sleep behaviors to the roster of health behaviors that may be compromised by trait procrastination. Across student and community adult samples, people who chronically procrastinated were likely to get insufficient sleep due to bedtime procrastination (Kroese et al., 2014), and have poor sleep quality overall (Sirois et al., 2015). If we consider that poor sleep quality and insufficient sleep are known to contribute to obesity in part through their negative impact on the regulation of eating behavior (Knutson, Spiegel, Penev, &

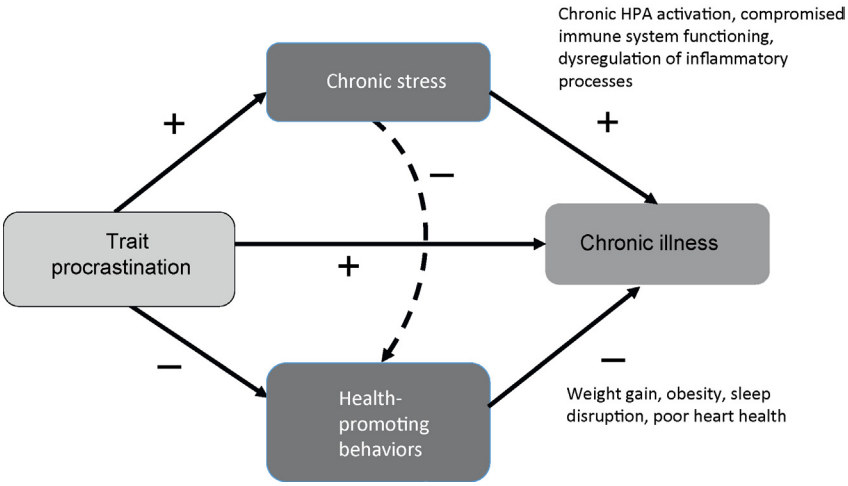

Figure 4.1 ***A temporally extended procrastination-health model (Sirois, 2007) illustrating the potential long-term effects of procrastination on health.*** *(Adapted from Sirois (2007)).*

Van Cauter, 2007; Zimberg et al., 2012), then it becomes quite clear that neglecting to engage in this constellation of health behaviors is a potential gateway to the onset of diabetes, cardiovascular disease, arthritis, and other chronic diseases.

A temporally extended procrastination-health model considers these combined potential effects of chronic stress and an enduring pattern of poor health behaviors. As Fig. 4.1 illustrates, this newly updated model outlines the potential ways in which both the *specific-* and *the nonspecific-indirect* effects may compromise health over time and contribute to the development of disease. At the time of this writing, there was only one study that provided supportive evidence for the notion that procrastination is linked to chronic health conditions. In a cross-sectional study, a subsample of 182 people with self-reported CVD/HT were compared with another subsample of 564 people with no self-reported chronic conditions of any kind (Sirois, 2015). After controlling for relevant demographic factors and other higher-order personality factors known to be associated with CVD/HT, those in the CVD/HT group were significantly more likely to score higher on Lay's (1986) general procrastination scale. Although causal conclusions cannot be drawn because of the study design, this study is the first to provide evidence hinting at the potential long-term health consequences of procrastination.

In addition to taking into account the joint effects of both routes linking procrastination to physical health, the new temporally extended model

also considers the potential synergy between stress and health behaviors. For example, there is evidence that higher perceived stress is causally linked to negative changes in health behaviors (Rod, Grønbaek, Schnohr, Prescott, & Kristensen, 2009). The negative relation between stress and health behaviors has also been found in the context of explaining the link between procrastination and health when testing the original procrastination-health model (Sirois, 2007). However, as discussed in the next section, this synergy outlined by the model is more than a simple negative linkage between stress and health behaviors, and highlights the potential dynamic interplay among temporal orientation, stress, and procrastination itself.

TEMPORAL MYOPIA, STRESS, AND HEALTH BEHAVIORS

As noted previously, temporal orientation plays a central role in explaining why procrastinators may have difficulty following through with important health behaviors. Health-promoting behaviors such as eating healthy and engaging in regular physical activity are well known to maintain health as well as reduce the risk of developing chronic disease in later life. Yet to fully appreciate the reality of these risks may require thinking not only about the potential outcomes of not engaging in health-protective behaviors, but also being able to envision a future self that perhaps has not made the right choices and what this may mean for one's health. Taking this more personal perspective on the future by imagining a future self can be an effective way to motivate action, as noted by Blouin-Houdon, Sirois, and Pychyl, Chapter 10, Temporal Views of Procrastination, Health, and Well-Being. However, this is not the default mode for most procrastinators. Some of the preliminary work by myself and colleagues suggest that procrastinators feel emotionally and psychologically detached from their future selves, and that this sense of disconnection increases as the temporal distance or horizon to an imagined future self increases (Blouin-Hudon & Pychyl, 2015; Sirois et al., 2014).

This tendency to have a foreshortened temporal horizon with respect to considering the consequences of one's choices and behaviors for one's future self can be thought of as a *temporal myopia*. In much the same way that medical myopia is a condition of the eye that involves a shortsightedness such that distant objects tend to appear to be out of focus, and close objects in focus, *temporal myopia* refers to a temporal focus that is shortsighted and focused predominantly on proximal rather than distal concerns. Consequently, those with temporal myopia may have difficulty

considering future-oriented outcomes and states. This notion of temporal myopia is related to Bluedorn's (2002) notion of *temporal depth*, a term from organizational behavior which refers to the depth in time that executives considered when contemplating events that may occur, or have already occurred in the case of past temporal depth. Future temporal depth is typically measured by asking people about the time frames they consider when thinking about short-, mid-, and long-term future, and then having them choose from one of 15 temporal horizons ranging from 1 day to 25 years. From this perspective, we might expect procrastinators to have a relatively shallow future temporal depth and be temporally myopic when considering the outcomes of health behaviors, and accordingly tend to not eat as healthy or be as active as they could because the consequences of these behaviors tend to have a fairly extended temporal horizon that may not register. At least one study has found some support for the role of temporal myopia in explaining why procrastinators tend to engage less frequently in health-promoting behaviors. In a large sample of 657 adults recruited from the community, feeling less emotionally close to one's 1-month and 1-year future selves partially explained the association between trait procrastination and less frequent engagement in health-promoting behaviors such as eating healthy, healthy sleep behaviors, managing stress, and getting regular physical exercise (Sirois et al., 2014).

Turning to the issue of *why* procrastinators may have temporal myopia and what this may mean for their long-term patterns of health behaviors and subsequent health outcomes, one answer involves the often high and chronic levels of stress that procrastinators experience. According to the *stress-orientation hypothesis* (Sirois, 2014a), the experience of stress itself initiates cognitive shifts that orient one's focus toward the immediate stressor and away from more distant concerns. In brief, stress is experienced when threat, harm, or challenge is experienced or anticipated (Lazarus & Folkman, 1984). The experience of stress initiates the stress response, which involves a cascade of neurophysiological responses that promote attentional, emotional, and behavioral changes to adapt to the stressor (Davis & Whalen, 2001; McEwen, 2007). Inherent within this stress response is the activation of brain areas involved in threat detection such as the amygdala, which increases moment-to-moment vigilance toward immediate threats and concerns so that resources can be redirected to cope with the perceived threat (Davis & Whalen, 2001). From an evolutionary perspective, this stress response and its corresponding cognitive shifts toward immediate concerns can be quite adaptive, in part because it refocuses attention to reduce or

remove perceived threats (LeDoux, 2000). However, from the perspective of the regulation of health behaviors, which have consequences that are not usually immediate, stress can be very disruptive simply because it foreshortens the temporal horizon with respect to the consideration of the outcomes from current behavior and choices.

When viewed from the lens of a temporally extended procrastination-health model, the proposed linkages among stress, temporal orientation, and health behaviors have some very important implications for the long-term health outcomes of procrastinators. With respect to temporal orientation, the *direct pathway* contributes to temporal myopia via activation of brain areas associated with detection of immediate threat, whereas the temporal myopia arising from the direct pathway also contributes to foreshortening the temporal horizon of current behavior choices, and thus contributes to the *indirect pathway* by making it more difficult to resist immediate temptations and follow-through with health-promoting and maintaining behaviors. Thus, temporal myopia can be a vector that dynamically links stress and health behaviors over time to create further vulnerability for procrastinators for the development of chronic disease.

Aside from the one cross-sectional study described previously, the notion that trait procrastination may contribute to the development of chronic disease through chronic stress and a long-term pattern of poor health behaviors is intriguing and provocative. Although it is based on extant theory and research, this proposition is nonetheless speculative without longitudinal evidence to provide stronger support. In contrast, the evidence regarding the possibility for trait procrastination to create vulnerability for poor health outcomes among those already living with chronic illness is compelling, and as it is discussed in the next section, highlights the importance of identifying and providing support for those living with a chronic disease who have an enduring tendency to procrastinate.

PROCRASTINATION AS VULNERABILITY IN THE CONTEXT OF CHRONIC DISEASE

Until very recently, the notion that procrastination may create vulnerabilities for the development of and poor adjustment to chronic health conditions was largely unexplored. Yet, in principle, it is reasonable to expect that any tendency that may (1) increase stress and (2) compromise important health-maintaining and disease-management behaviors should increase the risk for poor health-related outcomes among those already living with a chronic disease.

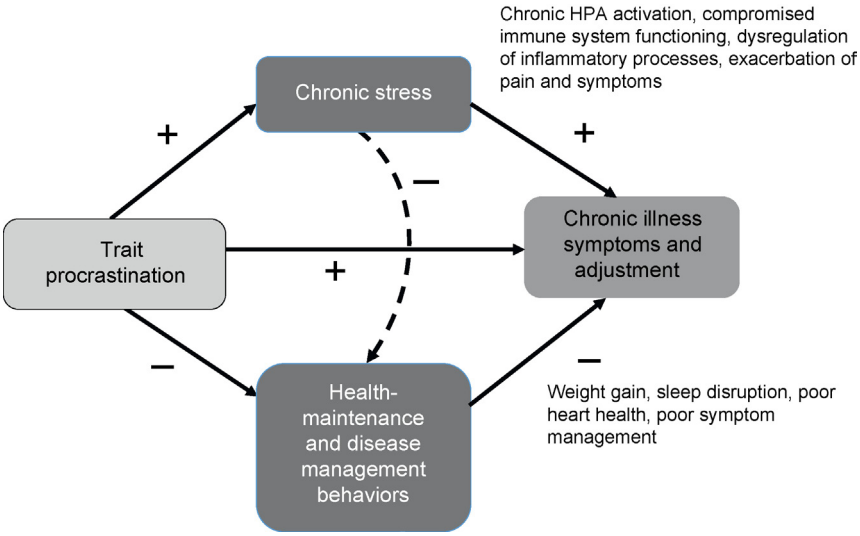

Figure 4.2 ***The temporally extended procrastination-health model (Sirois, 2007) applied to understanding the potential effects of trait procrastination in the context of an existing chronic illness.*** *(Adapted from Sirois (2007)).*

If we use the temporally extended procrastination-health model as a conceptual lens, then the specific ways in which procrastination may further compromise the health of people with a chronic disease becomes clear. For the most part, the direct and indirect pathways linking procrastination to physical health are the same as what has been discussed throughout this chapter, whether the effects are specific (related to a specific incident of procrastination) or nonspecific (arising from a more generalized tendency to procrastinate). However, the types of health-related behaviors implicated in the indirect route are slightly different, as are the proposed outcomes of the two routes. As outlined in Fig. 4.2, in the context of an existing chronic health condition or disease, trait procrastination has the potential to exacerbate symptoms and negatively impact adjustment and quality of life by contributing to stress and interfering with the practice of important health-maintaining and disease-management behaviors.

It is fairly well established now that stress, and chronic stress in particular, can create further vulnerability for poor health in individuals with chronic illness. This may be especially true for diseases which involve underlying inflammatory processes, such as arthritis (Evers et al., 2013), inflammatory bowel disease (Jaghulta et al., 2013), and cardiovascular disease (Rod et al., 2009) because stress can exacerbate existing symptoms, such as pain,

and increase functional limitations, and in certain illnesses, even contribute to disease progression (Evers et al., 2013). Stress is also known to wreak havoc with blood sugar levels, which can make monitoring a challenge for individuals with diabetes (Lloyd, Smith, & Weinger, 2005). If we consider the contribution of stress to temporal myopia and the subsequent consequences for engaging in health behaviors, it becomes clear that the stress associated with procrastination can potentially be very detrimental for anyone living with a chronic disease. This point is further underscored by the fact that living with a chronic illness is itself very stressful and is akin to living with a chronic stressor (Taylor & Sirois, 2014). Adding the stress from procrastination, therefore, further compounds and amplifies this stress, which, as noted, can have some very real health consequences in terms of both symptoms and disease management.

Engaging in health-promoting behaviors is particularly important for individuals living with a chronic illness because such behaviors have a central role in disease management and ensuring that the illness does not worsen. For many chronic illnesses, maintaining a healthy diet, staying physically fit, getting adequate sleep, managing stress, and other health maintenance behaviors are critical for weight management and the behavioral control of symptoms (Daskalopoulou et al., 2012; Gullíksson et al., 2011). However, these are also the types of behaviors that are likely to not only be viewed as unpleasant by someone living with a chronic illness, but also potentially difficult and challenging because of pain, fatigue, and other functional limitations that can interfere with their practice. In short, they are behaviors that are likely to engender procrastination, especially from those who tend to chronically procrastinate. Additional health behaviors that play a key role in disease management are medication adherence and getting frequent diagnostic testing and check-ups. However, as was noted in the first test of the procrastination-health model (Sirois et al., 2003), and a subsequent study with community adults (Sirois, 2007), procrastination can interfere with seeking medical care in a timely manner and may therefore also be a liability for engagement in a variety of important disease-management behaviors.

To date, there have been only two studies that have examined the potential for procrastination to create vulnerability for poor health-related outcomes in the context of chronic illness. The first involved people with CVD/HT that was previously described with respect to the procrastination score findings (Sirois, 2015). In this same study, the potential role of coping for explaining the stress associated with procrastination was also examined and compared across the healthy and CVD/T samples. Although

maladaptive coping explained the procrastination-stress link in both samples, the magnitude of the indirect effects through coping was significantly larger in the CVD/HT sample, indicating that procrastination was indeed a liability for those with poor heart health. The only other study to investigate trait procrastination in the context of a chronic health condition did so in a sample of 72 people with fibromyalgia (FM; Beauregard, Ioachim, & Sirois, 2015). Similar to the CVD/HT study, trait procrastination was associated with less ability and confidence in being able to cope with the symptoms, day-to-day problems, and emotional aspects of FM. Procrastination was also associated with lower levels of psychological thriving, indicating that procrastinators were having difficulty adjusting to living with their condition. This preliminary evidence is consistent with the proposals of the temporally extended procrastination-health model and provides some troubling yet important insights into how trait procrastination may compromise coping with the challenges of living with a chronic health condition.

CONCLUSIONS AND FUTURE DIRECTIONS

The aim of this chapter was to examine how and why procrastination may be a vulnerability for the development of, and adjustment to, chronic health conditions. By temporally extending the original procrastination-health model and recasting the health effects proposed by this model into a new 2 × 2 temporal framework, the new model offers a more sophisticated view of how procrastination relates to both short- and long-term health outcomes, including chronic illness. Importantly, this new temporally extended framework permits a more nuanced appreciation of the differences and similarities between situational and trait procrastination with respect to both the pathways linking procrastination to health and the potential outcomes of these pathways. It also provides an empirically based and theoretically derived model for understanding how procrastination may create vulnerability for poor health outcomes and adjustment among those already living with a chronic illness.

The research to date on the potential long-term health consequences of procrastination is promising, but limited, and suggests that further research attention is warranted to better understand how procrastination can impact health over time. The new model posits that procrastination may be a vulnerability factor for any chronic health condition for which stress and poor health behaviors are etiological and/or disease-management factors. From a public health perspective, this highlights procrastination as an important epidemiological factor that deserves greater consideration. This point may

appear to be overstated, especially given the small effect sizes found in the research to date. However, even small effects, such as those often associated with personality traits on health outcomes, can have meaningful, significant, and very practical ramifications especially when aggregated at the population level. As Ozer and Benet-Martinez (2006) have noted, such effects should not be discounted, but be considered routinely consequential. If we consider, for example, that approximately 59% of young adults in the United States have one or more risk factors for cardiovascular disease (e.g., smoking, hypertension, family history, or obesity) (Kuklina, Yoon, & Keenan, 2010), and that approximately 50% of students, who are most often young adults, procrastinate chronically (Steel, 2007), then this would suggest that approximately 30% of the young adult US population, or over 9 million people aged 18–24, potentially have an even further increased risk for the development of heart disease at some point in their lifetime because of their chronic procrastination. In terms of the size of that risk, consider the study on procrastination and CVD/HT previously described: for every one point mean score increase on the GPS, the risk of being in the CVD/HT group increased by 60% (Sirois, 2015). Taken together, this evidence builds a reasonable case for procrastination as an important factor to consider when assessing the vulnerability factors for chronic illness.

Despite these rather provocative numbers, there are a number of issues that future research will need to address to establish procrastination as a *bona fide* risk factor for poor long-term health outcomes. Given the cross-sectional nature of the research to date on procrastination and chronic illness, any causal conclusions about the role of procrastination in chronic illness are premature. Longitudinal research, preferably over an extended period of time, is required to make such causal claims. However, low conscientiousness, the Big Five personality factor that is most related to procrastination (Steel, 2007), has been linked to increased risk for the development of diabetes and diabetes-related mortality over time in a pooled analysis of five prospective studies (Jokela et al., 2013), suggesting that there may indeed be a causal link between procrastination and poor long-term health outcomes. Despite this promising evidence, longitudinal research is costly and often difficult to conduct due to high rates of attrition over time. Retrospective research focusing on potential changes or stability in tendencies to procrastinate would be one less costly and potentially effective way to understand the degree to which procrastination as a chronic trait-like tendency precedes rather than results from having a chronic illness. This is especially important to establish because chronic illness is well known to be linked to

high levels of fatigue (Hirsch & Sirois, 2014), and there is some evidence that fatigue itself may also contribute to a tendency to procrastinate (DeArmond, Matthews, & Bunk, 2014). Nonetheless, the weight of current evidence indicates that procrastination as a trait, and as measured by Lay's GPS (1986), is relatively stable and has a moderate degree of heritability (46%) as evidenced by twin studies (Gustavson, Miyake, Hewitt, & Friedman, 2014), and longitudinal research showing a good stability in GPS scores over both short and longer (10 years) intervals (Steel, 2007).

A final noteworthy area for future research to investigate involves mapping out the landscape of chronic health conditions for which procrastination may be a vulnerability. The finding that procrastination is linked to risk of poor adjustment and higher stress across two distinct chronic health conditions, CVD/HT and FM (Beauregard et al., 2015; Sirois, 2015), is promising and speaks to the potential generalizability of the effects suggested by the temporally extended procrastination-health model. Other chronic health conditions such as diabetes, which requires regular and often daily disease-management behaviors, and arthritis, which is sensitive to changes in stress levels, are good examples of illnesses that theoretically may be negatively impacted by trait procrastination. Regardless of whether causal links between procrastination and chronic illness can be confirmed, the findings to date indicate that at a minimum procrastination creates further health risk for those already dealing with a chronic health condition. Raising awareness of the risks of chronic procrastination among both patients and their health-care providers could potentially improve health outcomes as well as enhance quality of life.

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CHAPTER 5

Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency

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Although the prevalence of procrastination has been frequently noted (e.g., Ferrari, O'Callaghan, & Newbegin, 2005; Ferrari, Díaz-Morales, O'Callaghan, Díaz, & Argumedo, 2007), less attention has been paid to the diversity of domains in which it occurs. Many discussions have focused on situational procrastination in academic or workplace contexts, although it is also widely recognized that procrastinating can be a more generalized, trait-like tendency (e.g., Lay, 1986). For example, a tendency to procrastinate may be illustrated in a broad range of daily behaviors such as returning a phone call, responding to an invitation, or getting to the train station on time for your trip. Researchers are increasingly focusing on the importance of procrastination for health and well-being, and intriguing insights are emerging into the various ways in which procrastination behavior is related to outcomes in these domains, for example, through experiences of stress (Sirois, 2007; Tice & Baumeister, 1997). In this chapter, we will focus on a specific domain of procrastination, namely "bedtime procrastination": the phenomenon of postponing going to bed, typically resulting in a lack of sleep (Kroese, De Ridder, Evers, & Adriaanse, 2014; Kroese, Evers, Adriaanse, & de Ridder, 2014). We will discuss how a lack of sleep significantly affects health and well-being, how bedtime procrastination plays a role in this regard, and why people engage in bedtime procrastination. Finally, we will suggest interventions that may help people hit the pillow on time, and will discuss avenues for future research.

As a paradigm example of bedtime procrastination, consider the case of Sarah. Sarah thinks it is important to get sufficient sleep, and she knows from experience that she has to be in bed by 11:00 pm to avoid feeling tired and grumpy the next day, when her alarm will callously ring at 6:30 am.

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Nonetheless, on this particular Tuesday night, Sarah decides at 10:45 pm to "just have a peek" at Facebook. There she finds a link to an interesting news clip online, and the next thing she knows, she is watching funny YouTube videos of cats, rearranging her sock drawer, and playing Call of Duty, ending up mindlessly binge-watching reruns of MacGyver. And she does not even *like* MacGyver. Sarah does not get to bed until 2 am, and when the alarm goes off at 6:30 am, she feels annoyed with herself for letting herself go.

Anecdotal evidence suggests that many will find Sarah's case all too familiar, and recent studies from our research group have documented this impression. For example, in a representative sample of 2431 Dutch adults, over 50% of participants (excluding people diagnosed with a sleeping disorder or people working nightshifts) reported going to bed later than they would like to. Accordingly, 45% indicated feeling tired during the day on 2 or more days per week (Kroese et al., 2014b). These numbers indicate that going to bed late is indeed very common in the general population. Although this behavior may seem rather harmless, the sleep insufficiency that often results from bedtime procrastination (Kroese et al., 2014a) can have a range of negative consequences in terms of health and well-being.

SLEEP INSUFFICIENCY: A NEGLECTED HEALTH PROBLEM?

Getting sufficient sleep is essential for people to function well. This may be most apparent in terms of daily performance, where the loss of concentration or grogginess resulting from a bad night's sleep may be all too familiar to most people: everything you do just seems to take more effort; it is harder to focus on this book chapter, and more difficult to tolerate others around you who are being annoying. The importance of sleep, however, becomes significantly more salient once the focus shifts to the detrimental effects that sleep deprivation can have on long-term well-being and mental and physical health (e.g., Strine & Chapman, 2005).

For example, the perils of a lack of sleep range from declines in performance (Belenky et al., 2003; Curcio, Ferrara, De Gennaro, 2006) to road traffic injuries or mortalities (Connor et al., 2002). Chronically getting insufficient sleep can also lead to serious health problems such as hypertension, obesity, diabetes, and depression (e.g., Strine & Chapman, 2005; Gangwisch et al., 2006; Roane & Taylor, 2008). Moreover, in terms of well-being, a lack of sleep has been found to lead to lower levels of optimism and sociability (Haack & Mullington, 2005), and to be negatively associated with positive affect and having a sense of purpose in life (Steptoe, O'Donnell, Marmot, & Wardle, 2008).

There are several physiological and behavioral pathways that may explain the relationship between insufficient sleep and ill health. For example, experimental research suggests that even seemingly modest amounts of sleep loss, such as when people sleep 5 or 6 h per night for 1 week, leads to a suppression of immune functioning (e.g., Banks & Dinges, 2007; Vgontzas et al., 2004). In addition, insufficient sleep yields increased cortisol levels, implying that sleep affects the resiliency of the physiological stress response (Leproult, Copinschi, Buxton, & van Cauter, 1997). It also decreases insulin sensitivity, a factor that is known to contribute to the development of diabetes (Buxton et al., 2010; Spiegel, Tasali, Penev, & van Cauter, 2004). Moreover, sleep loss increases appetite by deregulating leptin levels (Omisade, Buxton & Rusak, 2010; Spiegel et al., 2004), which particularly induces craving for sweet and salty food (Tasali, Chapotot, Wroblewski, & Schoeller, 2014). Besides these physiological pathways, the relation between sleep and health may also be explained by behavioral effects. Just think of individuals whose sleep deprivation leaves them too tired to go the gym or cook a healthy meal.

Getting sufficient sleep is clearly important for mental and physical fitness. Not without reason, the Centre for Disease Control and Prevention has recently labeled getting insufficient sleep a "public health epidemic" (Centre for Disease Control and Prevention, 2014). Sleep researchers typically agree that 7 to 9 h of sleep would be "sufficient," leaving room for individual variation (Hirshkowitz et al., 2015). In light of this, it is striking how endemic sleep deprivation seems to have become in today's society. Corroborating our findings in the Dutch sample, Americans on average sleep 6.8 h per night, which is a full hour less than they did 70 years ago (Gallup, 2013). Moreover, 40% of Americans are getting less than the recommended number of hours of sleep per night (i.e., on average 6 h or less per night) and a similar percentage indicates they would feel better if they got more sleep. These numbers highlight the need to understand and reduce this self-undermining behavior.

To understand sleep deficiency, it is important to acknowledge the many factors that may contribute to it. Traditionally, studying sleep deficiency has largely been the domain of medical researchers, who are mostly interested in sleep disorders. These sleep disorders, such as insomnia (a sleep disorder that is characterized by an inability to initiate or maintain sleep as long as desired), sleep apnea (where interrupted breathing leads to poor sleep quality), and delayed sleep phase disorder (involving disrupted circadian rhythms) seriously affect sleep quantity and quality, leading to unfavorable outcomes in

terms of health and well-being such as those discussed earlier (e.g., Karlson, Gallagher, Olson, & Hamilton, 2013; Al Lawati, Patel, & Ayas, 2009). Another special group of interest comprise people working irregular nightshifts, who constantly have to adjust their sleep–wake cycles. Indeed, nightshift workers have been found to experience more sleeping problems (both in terms of sleep quality and quantity) than the general population (e.g., Ohayon, Smolensky, & Roth, 2010). An important research area in this domain investigates physiological determinants of sleep such as the "sleep hormone" melatonin that regulates circadian rhythms, explicating how disturbances in these factors—for example, due to working night shifts—impact sleep (e.g., Pandi-Perumal, Srinivasan, Spence, & Cardinali, 2007).

Obviously, the clinical perspective on sleep problems is important, with an estimated 10% of the population having been diagnosed with a sleep disorder (Ram, Seirawan, Kumar, & Clark, 2010). However, given that roughly 90% of people do *not* suffer from a sleep disorder—many of whom nevertheless suffer from sleep insufficiency—it is vital to also study sleep insufficiency from different vantage points. Other factors that have been put forward to explain the increasing lack of sleep pertain to environmental influences. As noted previously, people nowadays sleep more than an hour less than they did 70 years ago (Gallup, 2013), suggesting that getting insufficient sleep is a cultural product of our time. Whereas our ancestors would naturally go to sleep whenever it got dark outside, our current 24/7 entertainment industry does not mark a clear endpoint of the day. Particularly, the current widespread use of electronic devices—and more specifically those that emit blue light that is known to disrupt people's circadian rhythms—is blamed as a threat to a healthy night of sleep (e.g., Cain & Gradisar, 2010). Furthermore, it has been suggested that people's social schedules (e.g., school and work) are sometimes out of sync with their biological schedules (e.g., melatonin levels), leading to a situation where people become sleep-deprived due to not being able to go to sleep at the time their body demands. For example, someone may physically feel like sleeping from 2:00 am to 10:00 am, but be dictated by societal duties to get up at 7:00 am. This phenomenon has been coined "social jetlag," and it was found to be particularly prevalent in evening types (Wittmann, Dinich, Merrow, & Roenneberg, 2006).

A perspective that remains relatively understudied in the general population, however, is the role of behavioral factors. That is, sleep disorders and environmental factors do not suffice to fully explain the case of Sarah, who wanted to go to bed on time, had every opportunity to do so, but just did

not. Recent research corroborates our contention that many people get insufficient sleep due to factors that are within their control (Kor & Mullan, 2011; Kroese et al., 2014a, 2014b; Loft & Cameron, 2013, 2014; Todd & Mullan, 2013, 2014). Some of these cases of sleep insufficiency may be related to sleep difficulties as a result of stress or external reasons such as crying babies (e.g., Lund, Reider, Whiting, & Prichard, 2010). However, the evidence suggests that oftentimes, people get insufficient sleep not because they are *unable* to fall asleep, but because they *simply do not put themselves in a position to fall asleep*, implying that there is a behavioral component to the problem.

The behavioral vantage point on understanding sleep insufficiency has recently started to gain momentum, for example, through the work of Loft and Cameron (2013) who showed that a self-regulation intervention could improve sleep-related behaviors. Research has also shown that so-called sleep hygiene behaviors (e.g., disengaging from arousing activities close to bedtime, sticking to regular sleeping schedules) can affect the amount and quality of sleep (e.g., Gellis & Lichstein, 2009) and that effective self-regulation can improve such behaviors (Kor & Mullan, 2011; Todd & Mullan, 2013). Our distinctive contribution lies in focusing on the seemingly obvious (but still understudied) role of *going to bed* as a key behavioral determinant of sleep sufficiency. It is important to notice that when discussing sleep insufficiency from a behavioral point of view, we specifically focus on "going to bed" rather than "falling asleep" (hence, the term "bedtime procrastination"). Furthermore, we conceptualize "going to bed" quite broadly, namely as the activity of getting oneself in a position to go to sleep, which includes not only getting oneself into bed, but also turning off the light and powering down any electronic equipment. This way, delaying one's bedtime while lying in bed using a smartphone or tablet can still be categorized—depending on other conditions being met—as bedtime procrastination.

When we say that Sarah "wanted to go to bed on time, had every opportunity to do so, but just did not," psychologists will immediately think of a phenomenon that has been labeled the "intention-behavior gap": people who often have good intentions, but fail to behave accordingly (Sheeran, 2002). This incongruence between intentions and behavior has often been studied in the context of health behavior such as exercising, quitting smoking, or healthy eating. For all such behaviors, people tend to want to change—think, for example, of your past New Year's resolutions—but are unsuccessful in doing so. While Sarah seems to experience the same kind of problem, going to bed has not typically been approached as a case of a gap

between intentions and behavior. Thus, one of the promises of considering going to bed as a self-regulation behavior is that it puts it on par with other behaviors such as healthy eating and physical exercise, which have received much more research attention from behavioral scientists. This would offer interesting insights into underlying mechanisms as well as potential solutions to getting insufficient sleep.

However, the dominant attention to insufficient sleep from a medical or environmental rather than a behavioral perspective also seems to be reflected in public perceptions of sleep insufficiency, which does not readily seem to be considered as a lifestyle problem that is within people's own control. Public health campaigns directed at raising awareness about the risks of alcohol use, obesity, and smoking are ubiquitous, with public service announcements, billboards, flyers, and other promotional materials emphasizing the importance of exercise, smoking cessation, and a healthy diet. In contrast, public health campaigns aimed at promoting sleep in the general population are virtually nonexistent. To test if the lack of such campaigns is indeed reflected in people's perceptions about health problems, we asked a sample of participants on Amazon's Mechanical Turk (N = 163; 58% men, age range 18–68) to think of important ways in which people can improve their health by changing their lifestyle (Nauts & Kroese, 2014). A large majority of participants spontaneously mentioned exercise (86%) or diet (84%) as a health-related lifestyle choice, but only a small minority mentioned sleep (12%). This suggests that getting more sleep is not at the forefront of people's minds when they are thinking about ways of living a more healthy life—which is not to say that sleep is considered unimportant: in the representative Dutch sample discussed earlier, a majority of people who indicated going to bed late and getting insufficient sleep saw this as "problematic" (Kroese et al., 2014b).

In the next section, we further elaborate on our conceptualization of bedtime procrastination as a cause of sleep insufficiency. What is important to add here is that, while we think that bedtime procrastination is a behavioral factor that is distinct from the medical and environmental factors contributing to sleep insufficiency, this does not mean that it is entirely unrelated to these other factors. For example, we found evidence for bedtime procrastination in the normal population (i.e., people who do not suffer from sleeping disorders), but it may well be the case that bedtime procrastination aggravates problems in sleep-disordered patients or that sleep disorders may exacerbate bedtime procrastination. Similarly, we believe that bedtime procrastination is key to explaining a reduced sleep duration, but

being exposed to bright lights in the evening may contribute to later bedtimes through an additional biological route as well. Hence, being a complex behavior that is affected by many factors, it is worthwhile to now focus on the relatively understudied behavioral aspects of getting sufficient sleep.

BEDTIME PROCRASTINATION AS A CAUSE OF SLEEP INSUFFICIENCY

We posit that one way of understanding the behavioral cause of sleep insufficiency is by approaching it as a form of procrastination. That is, one reason as to why people increasingly get insufficient sleep is simply because they go to bed too late, even if they have to get up early in the morning—the phenomenon we labeled "bedtime procrastination" (Kroese et al., 2014a, 2014b). Procrastination typically involves unnecessarily delaying an intended course of action (e.g., doing the dishes after dinner), despite expecting to be worse off as a result (e.g., delaying dish-washing makes the task more difficult and aversive due to the accumulation of mold and dried muck; Heath & Anderson, 2010). In this sense, procrastination concerns a misalignment of intentions and behavior that can be regarded as a self-regulation problem (Van Eerde, 2000; Steel, 2007). Based on prior definitions of procrastination, and illustrated by the case of Sarah as discussed at the beginning of this chapter, we identify three criteria that determine whether a certain behavior qualifies as bedtime procrastination (for a further discussion regarding this approach to defining procrastination, see Chapter 3, Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay).

Criterion 1: Delay

"Going to bed later than planned" has been formulated as a central aspect of bedtime procrastination (Kroese et al., 2014b). Indeed, delaying an action can be regarded as a core aspect of procrastination. Although not all delay is procrastination (see Section "Criterion 3"), all procrastination does involve delay. In many cases, procrastinators are keenly aware of the time at which they intended to do something and are quite conscious of disregarding the fact that they have scheduled a point in time at which to do something—such as going to bed at 11 pm. But not all procrastination involves temporally specific plans or explicit awareness of delay. In defining "bedtime procrastination" in terms of going to bed "later than planned," we do not want to suggest that this means that going to bed a couple minutes

after, say, 11 pm has to count as "delaying." Indeed, another MTurk study we conducted (N = 145, 58% men; excluding people who were diagnosed with a sleeping disorder or working night shifts) revealed that 43% of self-proclaimed bedtime procrastinators did not have a planned bedtime (Nauts, Kroese, de Ridder & Anderson, 2014). Usually procrastinators do have a nagging—if vague—sense that they are delaying an intended task.

Mindless delay can, however, still be procrastination. In cases where the delay results from inattention—a common occurrence in our studies of bedtime procrastination—it may only become clear in retrospect that one was delaying and could have known it. Procrastination does not require either explicit awareness of delay or a precise temporal plan, but as a failure of self-regulation, it does ultimately need to be connected to the procrastinator's intentions regarding acting in a timely way. In sum, then, the form of task delay involved in procrastination involves either acting with a sense that one is departing from a more-or-less clear intention to do something within a particular timeframe or acting in a way that, according to one's later judgment, one could have seen to be an instance of delaying.

Criterion 2: Lack of a Valid Reason to Delay

A second important criterion is that the delay of going to bed needs to be unwarranted: someone could have gone to bed in time, but chose not to. In other words, a person does not have a *valid reason* (e.g., stuck in traffic, caring for an infant, working night shifts) for going to bed late. Indeed, most definitions make clear that procrastination is one form of delay: delay is only procrastinatory if it is needless and voluntary (Lay, 1986; Steel, 2007). That is, people who procrastinate have the ability and the opportunity to start a task (e.g., do homework, go to bed), but choose not to. Sarah, our paradigm case of bedtime procrastination, could have gone to bed earlier, but chose to watch reruns of MacGyver over getting a good night's sleep. If Sarah had gone to bed at 2 am not because she was watching reruns of MacGyver, but because she had to take care of her sick infant, her behavior would not have constituted bedtime procrastination. Likewise, Sarah's behavior would not constitute bedtime procrastination if she stayed up until 2 am because she suffers from a sleep disorder (e.g., delayed sleep phase disorder) that simply would not allow her to fall asleep before that time. Put this way, bedtime procrastination is restricted to cases in which people are in a position to go to bed but, for some reason, do not. Thus, delaying sleep only constitutes procrastination if the delay in bedtime is needless.

Criterion 3: Foreseeably Being Worse Off

Finally, an important criterion for procrastination—including bedtime procrastination—is that people should expect to be worse off as a result of their behavior. Prudent delay is not procrastination at all. Indeed, many definitions of procrastination emphasize that delay, next to being needless and voluntary, should have negative consequences, or should be expected to have negative consequences, to qualify as procrastination. Some researchers have suggested that procrastination is accompanied by psychological upset (e.g., Milgram, Gehrman, & Keinan,1992) or negative emotions (Ellis & Knaus, 1977; Solomon & Rothblum, 1984), while others have emphasized that procrastination involves needlessly delaying an action *despite being worse off as a result of doing so* (Lay, 1986; Steel, 2007).

Notably, we prefer the phrase "foreseeable consequences," thereby avoiding assuming that people have an explicit belief that things will be worse, or clearly *expect* such outcomes. People who engage in procrastination may not always have this level of insight, particularly in the case of bedtime procrastination. After all, people engage in bedtime procrastination at night, when executive functioning is often impaired as a result of fatigue (possibly combined with the effects of alcohol; Baumeister, 2002), and people's level of insight in the potential consequences of their behavior is not at its peak. Sarah, for example, is clearly worse off as a result of her bedtime procrastination, but the question is whether she expected this. On our definition, Sarah's MacGyver-watching can count as procrastination even if she did not explicitly weigh the pros and cons, as long as she meets the counterfactual requirement that, if someone would have stepped in and asked her to reflect on her behavior she would have likely been able to indicate that it would have negative consequences. In many cases of mindless procrastination, one's subsequent regret expresses one's acknowledgement that one *could have known* the delay would leave one worse off. (Note that much the same can be said for after-the-fact realizations that one was, indeed, delaying; see Section "Criterion 1.")

Also, the "foreseeable negative consequences" cannot be established on the basis of actual consequences of bedtime procrastination, given that people sometimes expect negative consequences but do not experience them or elect to delay without being in a position to know that the consequences will be disastrous (Heath & Anderson, 2010). For example, if Sarah were to unexpectedly get a day off from work (e.g., due to a snow day), her MacGyver-watching behavior would still constitute procrastination because she could have reasonably expected to be worse off as a result. Thus, even if

people do not expect to be worse off as a result of procrastinating, but any reasonable person would expect them to be, their behavior would still constitute procrastination. By adding this "reasonable person standpoint," the definition includes cases in which people stay up until 2 am while having to get up at 6 am, but were too inattentive to foresee that doing so would yield negative consequences. That is, as long as they clearly could have expected these consequences if they had thought about it, and any reasonable person could have recognized that going to bed late will likely make them feel tired, their behavior would still be procrastinatory in nature. In other words, the point is not that the person actually thinks "I am going to regret this" but rather that, with the knowledge available at the moment of procrastinating, it is vastly more likely that the delay will lead to results that are worse than the results of doing it now.

Conversely, bedtime procrastination still counts as procrastination even when the delay ends up having positive results, as when going to bed later than planned leads to an unexpectedly good night of sleep. Unless the results are foreseeable, the fact that they are positive is irrelevant when determining whether something is procrastination or not. In sum, aligning with commonly used definitions of procrastination, bedtime procrastination would then constitute "needlessly and voluntarily delaying going to bed, despite foreseeably being worse off as a result."

Approaching cases like Sarah's as procrastination yields interesting new perspectives on sleep insufficiency and its underlying mechanisms. It is important to stress again that going to bed (or sleeping behavior, for that matter) has not been conceived of as a self-regulation or health behavior problem before. This novel perspective thus gives rise to exciting new roads to help people get a better night's sleep and hence improve their health. Before we continue to speculate on implications for health interventions, we first discuss the prevalence of bedtime procrastination in the general population and dig a bit deeper into the underlying mechanisms of bedtime procrastination as a self-regulation problem.

BEDTIME PROCRASTINATION IN THE GENERAL POPULATION

Of course we do not want to stick to an anecdotal case, without giving attention to bedtime procrastination in the general population. Intriguingly, bedtime procrastination turns out to be a highly prevalent phenomenon: in the representative Dutch sample referred to earlier in this chapter, 74%

of participants indicated going to bed later than planned at least once a week, while no "external reasons" could be held accountable (Kroese et al., 2014b). Within the subsample of bedtime procrastinators, 49% went to bed later than planned three times or more in an average week, with 7% going to bed later than planned on a daily basis. Data from American samples suggest that the high prevalence of bedtime procrastination is not limited to the Dutch cultural context (Kroese et al., 2014a; Nauts et al., 2014), although more research is needed to investigate its prevalence cross-culturally. In sum, these data suggest that people often go to bed later than they could have, should have, and/or intended to. Moreover, bedtime procrastination was strongly related to sleep insufficiency ($r = 0.61$) and daytime fatigue ($r = 0.46$; Kroese et al., 2014a), also after controlling for demographics and the self-reported extent to which external factors such as crying children or medical problems generally make it difficult for people to go to bed on time (Kroese et al., 2014b). Hence, these findings suggest that bedtime procrastination is a prevalent phenomenon that negatively affects sleep-related outcomes.

Not surprisingly, then, bedtime procrastination is also negatively related to well-being. We ran a survey on Amazon's Mechanical Turk (MTurk) among a sample of 85 US-based adults (42% male; again excluding people who had been treated for sleeping problems and those working nightshifts; Kroese & Nauts, 2015). Well-being was assessed with the WHO-5 Well-Being Index (Heun, Bonsignore, Barkow, & Jessen, 2001). Controlling for demographics and self-perceived physical health, a significant relation was found between bedtime procrastination and psychological well-being ($\beta = -0.43$, $p < 0.001$). The greater the extent to which people reported going to bed later than intended, the lower their subjective well-being, although part of the effect seemed to be explained by trait self-control (i.e., the ability to inhibit impulses; Tangney, Baumeister, & Boone, 2004) which is a factor known to be associated with both bedtime procrastination and well-being. Similar relations were found between bedtime procrastination and social and emotional health. In sum, these findings show that bedtime procrastination is negatively associated with psychological well-being.

In order to better understand bedtime procrastinators and their motivations, we asked participants in our earlier study (Nauts et al., 2014) to think back to the last time they went to bed late and indicate why they went to bed late. Their answers were coded by two independent raters into categories of "leisure" (e.g., watching TV, playing computer games) or "obligations" (e.g., having to finish work). A majority of 61% of the people

mentioned engaging in leisurely activities, 25% was fulfilling an obligation and 14% did not mention what he or she was doing. Examples of leisure activities mentioned by participants are "Yankees on TV played extra innings," "I was playing a computer game and time got away from me," and "I was binge watching *Orange is the New Black* on Netflix." This corroborates findings by Kroese et al. (2014b) suggesting that people who engage in bedtime procrastination often spend their time watching TV or using the computer. We also coded if people mentioned not going to bed because they did not feel tired (3%), had trouble falling asleep (5%), or were too tired to go to bed (1%). These factors were spontaneously mentioned by a minority of people, corroborating our viewpoint that many people who went to bed late could have gone to bed earlier, but simply did not.

Taking a closer look at our third definitional criterion—foreseeable negative consequences—we asked participants in the same study to write down how they felt the day after they went to bed late. A large majority of participants (79%) spontaneously indicated feeling tired or fatigued as a result of engaging in bedtime procrastination (e.g., a participant mentioned "I felt tired and groggy all day"). Moreover, 27% of participants indicated feeling irritable (e.g., "Tired, frustrated, irritable and unhappy"), and 10% mentioned negative self-based emotions such as guilt or shame (e.g.,"guilty," "I felt drained and tired and ashamed"). Interestingly, 10% of participants mentioned something positive, such as feeling relaxed as a consequence of having some time for themselves (e.g., noticing that they felt "relaxed, comfortable"). If these positive outcomes were foreseen, these instances would not qualify as bedtime procrastination. However, for a large part the positive emotions appeared to have arisen from the fact that people felt better than they anticipated (e.g., "clearer headed than I expected," "ironically, I feel great today"). In sum, next to the previously discussed broader relationships between bedtime procrastination and well-being, these findings more specifically show how for a majority of bedtime procrastinators unnecessarily going to bed late has a negative impact on well-being right the next day.

Up to this point, we discussed the definition of bedtime procrastination and illustrated the prevalence of this phenomenon in the general population, as well as some consequences of bedtime procrastination for health and well-being. Many readers may have recognized this phenomenon as something they experience themselves or see with others around them. Next, we turn to the underlying mechanisms that may play a role, and that will lead us into a discussion of potential interventions to reduce bedtime procrastination. To this end, we first discuss the association between bedtime

procrastination and general procrastination and some common underlying factors, while also highlighting how bedtime procrastination may be different from other types of procrastination. We then focus on three classes of strategies that may help in combating bedtime procrastination, namely instigating public awareness campaigns about the importance of sleep, teaching people the advantages of engaging in more specific planning, and structuring the environment to be goal conducive. We conclude with a discussion of possible avenues for research that we think will be fruitful.

BEDTIME PROCRASTINATION VERSUS GENERAL PROCRASTINATION

Like other forms of procrastination, going to bed too late involves delaying an intended course of action: in this case, hitting the pillow. In this sense, bedtime procrastination may be a form of procrastination that is in many ways comparable to other forms of procrastination such as academic procrastination, delaying the start of your diet, or procrastinating saving for retirement. In line with this view, there is a rather strong correlation between general procrastination (as measured by Lay's General Procrastination Scale; Lay, 1986) and bedtime procrastination ($r = 0.60$, Kroese et al., 2014a), suggesting that people who are more likely to procrastinate in general in their daily life are also more likely to go to bed later than they intended.

One explanation for the association between general procrastination and bedtime procrastination could be that people who have been delaying their duties during the day still need to finish work at night, preventing them from going to bed on time. For example, if someone has to submit a conference abstract before the deadline tomorrow morning, but has been postponing this long-known task such that he or she has still nothing written down when leaving work at the end of the day, the person may end up having no other option than writing it at night, even though it could interfere with an intention to go to bed early. Having said that, our MTurk study discussed earlier revealed that "obligations" were only mentioned by a minority of people as a reason for going to bed late, while fun activities seemed to account for a much larger proportion of bedtime procrastination. Thus, it would not be valid to assume that bedtime procrastination occurs as a mere *consequence* of general procrastination.

The most prominent candidate to explain the relationship between general and bedtime procrastination, then, would be a common underlying personality trait of having low self-control—a personality characteristic that

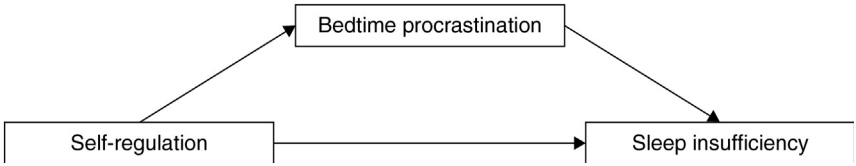

Figure 5.1 ***Self-regulation is associated with sleep insufficiency through bedtime procrastination (Kroese et al., 2014b).***

reflects the extent to which people are able to resist temptations and inhibit their impulses (Tangney et al., 2004; see Fig. 5.1). Low self-control would be a typical explanation of why people tend to postpone their duties and fail to complete a conference abstract in time, while it would also be plausibly related to being unable to quit doing fun activities (e.g., watching *Orange Is the New Black*) for the sake of other goals such as getting sufficient sleep. General procrastination has indeed been commonly associated with low self-control, and is even considered a typical illustration of it (Baumeister, 2002). Accordingly, bedtime procrastination is also associated with low self-control ($r = -0.39$; Kroese et al., 2014b). A composite measure of scales related to self-regulation (i.e., self-control, conscientiousness, impulsivity and action control) yielded a similar negative relationship to bedtime procrastination ($r = -0.52$; Kroese et al., 2014a). This suggests that people who are generally easily distracted from their long-term goals are also more likely to delay their bedtimes.

In line with these findings, we suggest that, like many other health-related behaviors (e.g., breaking a diet, having unprotected sex, drinking too much alcohol), bedtime procrastination can be regarded as an instance of self-regulatory failure (Baumeister & Heatherton, 1996; van Eerde, 2000; Steel, 2007). Instead of resisting the temptation to look for funny cartoons online or binge-watch a TV show, procrastinators indulge, jeopardizing higher-order goals in the service of immediate gratification. In other words, bedtime procrastination, like other forms of procrastination, often involves "giving in to feel good" (Sirois & Pychyl, 2013), even though doing so may come at the expense of well-being in the near future as well as in the long run (see Chapter 10, Temporal Views of Procrastination, Health, and Well-Being).

An important question in this regard is whether procrastinators give in to temptation deliberately (by *choosing* not to go to bed), or whether lying on the couch watching TV is an act that occurs mindlessly. It is only quite recently that these two separate routes toward self-regulatory

failure—deliberate versus impulsive—have been clearly distinguished. Research on self-regulation failure originally focused on mere impulsive "breakdowns of willpower." Prominent models of self-regulation distinguish two processes that determine behavior: one impulsive or "hot" route, and one reflective or "cool" route (dual-process models, e.g., Strack & Deutsch, 2004; Metcalfe & Mischel, 1999). Whereas the reflective route is directed by goals and long-term interests, the impulsive route is oriented toward immediate pleasure. According to these models, self-regulatory failure is due to the impulsive system taking precedence over the reflective system, for example, because people are in "hot states" that trigger hedonic orientations and inhibit long-term goals. Examples of such hot states are mental fatigue, being under the influence of alcohol, or being under high cognitive load (Hofmann, Friese, & Strack, 2009). Thus, (only) when people have sufficient willpower to override their hedonic impulses and favor the reflective system, successful self-regulation should follow. Recent research, however, has challenged the idea that self-regulatory failure is caused by impulsive processes only. Instead, deliberate rationalization processes such as self-licensing have been shown to contribute to goal-disruptive behavior as well (De Witt Huberts, Evers, & De Ridder, 2014). For example, when people feel they have exerted a lot of effort, when something positive (or negative!) just happened, or when it is a "special occasion," they may feel licensed to indulge in temptation. This would then not be attributed to a lack of willpower or a dominant impulsive system, but is rather a reasoned route toward self-regulatory failure.

The same line of reasoning may apply to bedtime procrastination. One reason people may not go to bed is because they do not have the willpower to do so (e.g., they are very tired and completely immersed in an engaging game), while another reason may be because they simply do not want to (e.g., they consciously decide they need some extra time to unwind). This is a relevant distinction, not only for the bedtime procrastination context but also for procrastination research in general. For one, these different routes to procrastination may require different types of interventions. In this context, it is interesting to think again about the 10% of participants in the previously discussed study (Nauts et al. 2014) who mentioned positive consequences of going to bed later than planned. Although the data suggested that for most people the positive consequences were unanticipated, there could be a small subsample who deliberately decide to delay their bedtimes because they give priority to other activities, and who benefit from feeling relaxed after having taken some time for themselves to unwind from their stressful

daily lives. These people would not be bedtime procrastinators, even if their preference for having "slack time" means incurring negative effects on their health. On the other hand, there may be people who deliberately decide to procrastinate while knowing they will regret it the next morning. Thus, in line with recent suggestions in other self-regulatory domains, it seems reasonable to expect that procrastination (general as well as bedtime procrastination) can follow an impulsive or deliberate route. Specifically, people may deliberately come up with excuses as a license to watch just one more episode of their favorite TV show before turning off the TV and turning in, or they may mindlessly keep watching.

BEDTIME PROCRASTINATION VERSUS OTHER FORMS OF PROCRASTINATION

Although bedtime procrastination shares many similarities with other forms of procrastination as pointed to earlier, there may also be several differences. First, procrastination usually involves delaying a task that people find aversive, for example, because it is perceived as boring, frustrating, or anxiety provoking (e.g., Blunt & Pychyl, 2000; Ferrari, Keane, Wolfe, & Beck, 1998; Milgram, Marshevsky, & Sadeh, 1995; Solomon & Rothblum, 1984; Steel, 2007). Unlike doing the dishes or writing a paper, however, going to bed is unlikely to be considered aversive by a majority of people. In fact, diary studies suggest that sleep has above-average enjoyment ratings (Gershuny, 2013). Thus, unlike other activities that are often unnecessarily put off, going to bed is not generally considered aversive. Nonetheless, it could be the case that bedtime routines (e.g., flossing, brushing one's teeth) or morning routines (e.g., going to work while it is still dark out) are aversive to some people, thereby contributing to bedtime procrastination. Alternatively, it may not be the initiation of going to bed but rather having to quit other activities—analogous to the classic negative punishment paradigm whereby the removal of something pleasurable is punishing—is what is aversive. For example, people may not like to stop watching a movie, or may have trouble accepting that the day is over. Thus, whereas the relationship between task aversiveness and procrastination is straightforward for many kinds of procrastination (e.g., academic procrastination, procrastinating on household chores), this relationship may be more complex in the case of bedtime procrastination.

A second difference is that, unlike other types of procrastination, bedtime procrastination is inherently depleting. Depletion refers to the

phenomenon that regulatory resources, or the capacity to control one's behavior (willpower), are drained. Research has consistently shown that once people have used their regulatory resources on one task, they will perform worse on subsequent tasks requiring willpower (Baumeister & Heatherton, 1996; Hagger, 2010). For example, after a long day of work where someone has had to concentrate on a boring task, resist the urge to snap at a colleague, and say "no" to the treats offered during coffee breaks, not much willpower is left to resist the temptation of a scrumptious dessert. Procrastination itself is not depleting: people do not necessarily become more tired or depleted from surfing the web looking for funny videos of cats while they are at work. Bedtime procrastination, on the other hand, occurs at a time of the day when regulatory resources are inherently low (Baumeister & Heatherton, 1996) and, moreover, regulatory resources suffer as a result of sleep deprivation (e.g., by not going to bed, people become more and more depleted; see, for example, Hagger, 2010). Since bedtime procrastination coincides with depletion of resources, it would be a particularly pernicious, self-perpetuating form of procrastination that robs people of the regulatory resources they need to "pull themselves together" to override their impulse and go to bed.

Hence, we think of bedtime procrastination as a particular form of procrastination that shares a common ground with general procrastination but also has some distinct properties. These warrant specific research attention in future studies to be able to further understand this novel phenomenon that appears to be a relevant contributor to insufficient sleep.

POSSIBLE INTERVENTIONS

So far, we have argued that (1) sleep insufficiency is a serious health issue that has a behavioral component; (2) conceptualizing going to bed late—cases such as Sarah's—as a form of procrastination helps to shed light on underlying mechanisms; and (3) empirical data support the conceptual associations between bedtime procrastination and general procrastination, thereby confirming that it is related to self-regulation.

As touched upon before, introducing procrastination as a novel perspective from which to approach sleep insufficiency sheds light not only on the underlying mechanisms but also on potentially effective strategies for addressing this health issue. Based on our conceptualization of bedtime procrastination as a self-regulation issue, we see a number of possible routes toward getting people to go to bed earlier. Specifically, interventions may

be most promising if they focus on helping people align their behavior with their intentions. Importantly, this does not mean that everyone should sleep at least 8 h a night or go to bed before midnight; rather, this is about supporting interventions that could help people self-regulate more effectively by scaffolding (backing up) people's own intentions, regardless of whether they prefer to make long nights and go to bed at 10 pm or they need less sleep but feel they should still hit the pillow before 1 am.

As a starting point, Pychyl (2013) listed a number of intervention strategies that could be helpful in reducing (general) procrastination. It is good to note here, however, that there has been surprisingly little empirical research on interventions targeting general procrastination. Most procrastination research seems to have focused on identifying procrastinators based on personal characteristics or investigating contributing factors to, and outcomes of, procrastination. Hence, before beginning to discuss potential interventions for bedtime procrastination specifically, we suggest that more research attention should be devoted to how procrastination can be reduced. Having said that, we will consider a number of the suggested strategies by Pychyl (2013) for our specific case of bedtime procrastination.

Raising Awareness

An essential starting point should be awareness. Given that sleeping behavior does not appear to be on the top of people's minds when they are thinking about health—as illustrated earlier in this chapter—it may be worthwhile to raise awareness about the negative health and well-being consequences of sleep insufficiency. In our view, awareness should specifically be directed to improving people's insights into their own behavior. When asked, a strikingly large number of people indicate sleeping too little and going to bed too late, yet going to bed earlier is not typically considered something they might change. Monitoring one's own behavior, and noting the discrepancy between one's current state and a desired state, is indeed considered an essential first step in the process of self-regulation according to cybernetic models (e.g., Carver & Scheier, 1998). For example, research in the domain of eating behavior illustrated that just monitoring behavior by keeping food intake diaries already led to behavior change (i.e., eating less unhealthily; Verhoeven, Adriaanse, De Vet, Fennis, & De Ridder, 2014). Translating this to the domain of bedtime procrastination, what would be needed is for people to more explicitly think about their evening routines and how that aligns with their sleeping preferences. For example, people could ask themselves what their intended bedtime would actually be, what they will be

doing during the evening, why they could potentially end up delaying going to bed, and how they would feel about it the next day if they did.

Planning

A second strategy that has proven effective for other self-regulation problems is making effective plans. As alluded to previously, many people seem to have no explicit plans regarding the specific time they would like to go to bed, even though they realize in hindsight that they may have gone to bed "too late." This lack of planning may constitute an important part of the problem, because it makes it difficult to monitor "in the heat of the moment" whether behavior is in accordance with one's intentions. For example, if people intend to go to bed on time without specifying a *specific* time or situation, they may not realize whether "on time" has already passed when they are in the middle of a movie or computer game. It has been often demonstrated that specific planning greatly increases the alignment of intentions and actual behavior (Gollwitzer, 1999). Particularly, the use of specific if-then plans, known as *implementation intentions* has shown to be effective in boosting behavior in a wide range of domains including recycling (Holland, Aarts, & Langendam, 2006), taking vitamin pills (Sheeran & Orbell, 1999), going to a medical screening (Sheeran & Orbell, 2000), and reducing unhealthy snacking (Adriaanse, de Ridder, & de Wit, 2009).

Implementation intentions are effective because of two underlying mechanisms (Webb & Sheeran, 2007). First of all, if-then plans specifying a situation (the "if") and a behavior (then) help to make this critical situation more salient as a good opportunity to perform the behavior. For example, specifying that a person will go to bed at 11 pm or after the "Tonight Show with Jimmy Fallon" has finished will provide this person with a clear cue to act once he or she encounters these respective situations. The second underlying mechanism is that the if-then format of the plan yields a mental association between these two parts, that is, the situation and the behavior. This means that when the "if" situation arises (e.g., the Tonight Show is over), the planned behavior (e.g., going to bed) automatically comes to mind (Webb & Sheeran, 2007). Without having to deliberate about the planned behavior, people will then automatically perform the intended path of action.

We suggest that, in line with the impressive results found for other self-regulation issues, implementation intentions could be an effective strategy to reduce bedtime procrastination. As previously illustrated, a typical implementation intention might look like this: "if the Tonight Show is over,

then I will go and brush my teeth." Challenges for a successful application of this strategy are to identify good if-statements, and to formulate clear then-statements. The "if" needs to refer to a situation that is concrete and unambiguous (e.g., "if I come back from walking the 11 o'clock walk with the dog" would be better than "if I feel like it"). At the same time, there is a trade-off between specificity and flexibility in the formulation of good action plans: putting a specific situation in the if-part of the plan makes it more likely that solid mental associations are established and that the plan will be executed (e.g., Van Osch, Lechner, Reubsaet, & Vries, 2010); however, if the situation is too specific, the plan may lose flexibility. For example, the bedtime implementation intention example provided earlier (if the Tonight Show is over...) would not work when the show does not air (e.g., on Sundays) or when someone is away from home that night. Thus, a good plan needs to be specific enough to involve clearly identifiable cues, and flexible enough to allow for its execution in various situations. As for the then-part of the implementation intention, the literature suggests that it could both refer to concrete behavior (e.g., brushing one's teeth, starting one's bedtime routine) or to the overarching goal (e.g., going to bed on time). While the effectiveness of implementation intentions in the specific context of bedtime procrastination remains to be empirically tested, we think this is a type of intervention well worth pursuing.

Adapting the Environment

A third route toward reducing bedtime procrastination would be to adapt the environment in such a way that the presence of temptations is limited and/or people are automatically and subtly reminded of their bedtimes. Similar to throwing out cigarettes when trying to quit smoking, or refraining from buying large bags of crisps when on a diet, removing temptations from the environment could work well in the case of bedtime procrastination. For example, the use of electronic devices has been highlighted as a factor that disturbs natural sleeping patterns (Wood, Rea, Plitnick, & Figueiro, 2013). This is due to two reasons. First, electronic devices have a bad reputation for interfering with sleep because of the emission of blue light that disturbs the process of melatonin production and consequently affects people's circadian rhythms (Chang, Aeschbach, Duffy, and Czeisler (2015). A second reason, which is more relevant for our current behavioral perspective, is that people get immersed in entertaining videos, games, or online social activities: these alluring temptations make people forget about time, making it difficult to stick to their good intentions. An intuitive solution, then, would be to limit

the use of such devices during evening hours. Indeed, this form of *stimulus control* has been advocated by researchers and professionals in the field of sleep disorders (Morin et al., 1999), and is also a typical self-regulation strategy in other health contexts, such as unhealthy eating (Berkel, Poston, Reeves, & Foreyt, 2005).

Additionally, the environment could be used to provide cues that act as reminders for people's bedtime intentions. For example, a signal in the room (e.g., a noise, a light) at a certain time in the evening could remind people that it is time to go to bed. This could be a successful strategy especially when this cue would be automatically linked to the behavior: as soon as you see the lights turn purple, you get up to go to bed. This way, people do not need to deliberate on when they should go to bed, which would require too much cognitive effort of people when they are already tired. This automatic activation of the desired behavior can either be established by *creating* an association between an environmental cue and the intended behavior, similar to the implementation intention procedure described earlier, or by using cues that have a *natural* association with going to bed, such as dimming lights. Again, the purpose would be to trigger the intended behavior without requiring deliberative effort. This is important since self-regulation strategies that rely on sheer strength of will are likely less effective, particularly in the long run (Baumeister, 2002). As alluded to earlier, this may especially be true when targeting bedtime behavior, because the end of the day is a typical state in which self-regulatory resources are low. Thus, strategies to prevent bedtime procrastination should essentially *make it easier* for people to perform the desired behavior (for a discussion of environmental approaches to reducing procrastination, see Chapter 3, Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay).

AVENUES FOR FUTURE RESEARCH

Research on bedtime procrastination is still in its infancy. At the same time, in light of the negative consequences of sleep insufficiency, knowledge about contributing factors and potential solutions to bedtime procrastination could have important implications in terms of health and well-being. Therefore, we strongly advocate paying more attention to sleep as a *health behavior*. That is, we contend that insufficient sleep should not only be studied in clinical subgroups, but also in the general population. Moreover, besides biological and environmental factors that may play a role, it is now

time to also consider behavioral aspects of getting too little sleep. In fact, sleep should receive a similar status as healthy eating and exercising both in terms of research efforts but also as a point of attention for health professionals working in the field. As some first guidelines, we suggest three avenues for future research that may be particularly fruitful.

First, it would be worthwhile to further explore people's reasons for engaging in bedtime procrastination. In particular, it would be interesting to consider if the two routes of self-regulation failure described earlier—impulsive versus deliberate—can also be distinguished for bedtime procrastination. People who deliberately decide to stay up may require different intervention strategies than people who impulsively let themselves get lured into all kinds of activities instead of going to bed. For example, for the former group, the problem may lie in an incongruence between how they expect to feel after a short night's sleep and how they actually feel. On the other hand, the impulsive types may instead have issues with reminding themselves of their intentions since they do not reflect on their behavior while in the middle of fun activities. Hence, insight into the reasons for bedtime procrastination is necessary for understanding where and how to intervene when aiming to reduce this behavior.

Second, research should be devoted to the connection between biological and behavioral factors related to sleeping. For example, as evening types are known to experience more difficulties going to bed on time (i.e., "on time" in terms of their social schedule as discussed earlier), it is likely that an association between chronotype (i.e., the manifestation of people's circadian rhythms) and bedtime procrastination would be found. Indeed, initial data suggest that this is the case, although bedtime procrastination still explains a unique proportion of insufficient sleep on top of what is explained by individual chronotypes (Broers, 2014). It would be interesting to see how biological and actual bedtimes interact: do people tend to go to bed late because they do not feel physically tired yet, implying that disturbed circadian rhythms may contribute to the development of bedtime procrastination; or could it also be vice versa—that people go to bed late despite their body telling them it is bedtime earlier, thereby creating a mismatch between biological and actual bedtimes and potentially contributing to further circadian rhythm disturbances? This is mere speculation at this point, but distinguishing between people who go to bed late because they are actually not tired versus those who are tired but still do not go to bed may yield important implications for understanding various sleep problems, especially since the research focus so far has mostly been on biological determinants.

A third avenue for future research pertains to investigating potential interventions to deal with bedtime procrastination. In the previous section we outlined a number of potentially promising interventions based on the self-regulation literature. Testing the effectiveness of such interventions not only has clear practical relevance, but also allows for the exploration of interesting theoretical questions. For example, how should interventions optimally be designed to be effective in states of low self-control? This is a question that would be relevant in a much broader context of (health) interventions, although it has hardly received any explicit empirical attention so far. Some first insightful work has illuminated how the characteristics of low self-control states (i.e., being more impulsive and sensitive to environmental cues) can actually be used to people's benefit: interventions could install cues to which people are impulsively drawn to steer them toward the desired behavioral choice. Salmon, Fennis, de Ridder, Adriaanse, and DeVet (2014), for example, showed that people with low self-control are particularly susceptible to an intervention promoting healthy food choices by *heuristics* (i.e., decisional shortcuts that are especially appealing to people who do not have the cognitive resources to deliberate; Tversky & Kahneman, 1974), even to the extent that people with low self-control were led to make healthier choices than those with high self-control—a very atypical but highly intriguing result. Given the evening context in which bedtime procrastination occurs, these and other questions may be worthwhile to explore in this novel behavioral context.

CONCLUSION

In this chapter, we discussed how a specific form of procrastination can affect health and well-being. Introducing bedtime procrastination as a predictor of getting insufficient sleep, we advocate going to bed on time being included in the list of behaviors that are typically studied in the context of healthy lifestyles. Considering going to bed from a self-regulation perspective yields interesting new leads for understanding and trying to reduce this self-undermining form of procrastination.

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CHAPTER 6

Measurement of Health-Related Procrastination: Development and Validation of the Exercise and Healthy Diet Procrastination Scales

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There are four major domains that affect human health and cause illness or death: human biology (e.g., genetics), health care or services, environment (social circumstances and environmental exposure), and behavioral patterns or lifestyle. Among these factors, the behavioral patterns (health-related behaviors) explain the largest variance in premature death (Schroeder, 2007) and may need to be considered as the only determinant of health with immediate accessibility for change and control in an individual's life (Ryan, Patrick, Deci, & Williams, 2008; Teixeira, Mata, Williams, Gorin, & Lemieux, 2012). Among various behavioral patterns, smoking, and the two key behaviors that determine weight regulation, healthy-eating and physical activity, are considered as the main behavioral factors that affect health and cause premature death (Schroeder, 2007; Teixeira et al., 2012).

Based on the theory of reasoned action (Fishbein, 1967) and later the theory of planned behavior (Ajzen & Madden, 1986; Ajzen, 1991), formation and strength of intentions have been identified as the main determinants of health-related behaviors. However, research has repeatedly demonstrated that there is always a large group of individuals that cannot adhere to their physical activity and healthy diet despite their intentions to do so (Armitage & Conner, 2001; Hall, Fong, Epp, & Elias, 2008). For example, intention cannot explain a significant and clinically considerable amount of variance in doing exercise and starting and maintaining a healthy-eating program (Armitage & Conner, 2001; Hall et al., 2008).

Recent work in health psychology has highlighted the importance of considering self-regulation failure in understanding this intention-behavior

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gap (Allom & Mullan, 2012; Hall et al., 2008). Over and above the effects of intentions, Hall et al. (2008) demonstrated the unique role of self-regulation (i.e., cognitive inhibition) in predicting physical activity and healthy eating behavior. From this point of view, a breakdown in cognitive inhibition can lead to a reduction in intended health behaviors such as doing exercise or starting and maintaining a healthy diet. Those with lower self-regulation ability are more likely to not do intended exercise or maintain a planned healthy diet (Allom & Mullan, 2012; Hall et al., 2008; Armitage & Conner, 2001).

Although a growing body of research suggests that there is a gap between intention and health behaviors, there is no self-report instrument that measures the phenomenon. Typically, health psychology research measures intention and behavior separately at two different times and looks at the extent to which the measure of intention at a specific point of time explains the variance in the measure of health behaviors at a later time, after the formation of the intention. In contrast, in the field of personality, the intention-action gap is seen through the lens of individual differences, specifically trait procrastination, with specific measures of this trait. Similarly in self-regulation research (Kuhl & Beckmann, 1994; Tice & Baumeister, 1997), the breakdown in intended action or a needless intention-action gap is called procrastination.

Procrastination has been studied and measured primarily for academic and everyday life. There is no validated self-report measure of procrastination on important health-related behaviors such as doing exercise and starting/maintaining a healthy-eating program. The main purpose of our studies was to develop a measurement framework and set of self-report scales that capture needless intention-action gaps in health-related behaviors. Since there are many health behaviors that can affect health and/or well-being, it was important to develop a context-specific system of measurement so it could be extended to other health-related behaviors. Doing physical activities and following a healthy-diet program, as two important health-related behaviors, were chosen as a base to operationalize health-related procrastination and create the initial item pools. The task-specific sets of items were named the Exercise Procrastination Scale (EPS) and Healthy Diet Procrastination Scale (HDPS). The scales were developed, analyzed, and refined simultaneously. As the scales potentially could be used in medical and public health research, it was important that they be short, demonstrate excellent reliability, and provide unbiased scores between different reference groups in the population. Finally, it was important to gather adequate support for

the dimensionality, as well as divergent, convergent, and discriminant validity of the measures before using the measures in research or applied settings.

In order to develop a reliable, unbiased, and short measure, experts in the field of psychometrics recommended the use of item-response theory (IRT) where both person and item properties are used to select a "best set" of items with a desired level of item and test reliability (Embretson & Reise, 2000; Fries, Bruce, & Cella, 2005; Reise, Ainsworth, & Haviland, 2005; Ware, Bjorner, & Kosinski, 2000). Person property or latent trait (Theta) is not a new concept; it has a similar meaning to the term "construct," "dimension," or "factor" in classical test theory or the concept of "trait" in personality psychology. In IRT, it is assumed that each person has a particular level of a trait or a location along the continuum of the latent trait. This continuum is often measured in a standardized format, from +3 to −3.

What is new in IRT for scale development is bringing the item properties, such as item difficulty, severity, or threshold (*b*), and item discrimination (*a*), into the process of decision making for selecting the best set of items. By considering item severity, we are assuming that each item and its response categories can capture different levels of severity of health-related procrastination. Item discrimination, on the other hand, helps us to understand the extent to which each item can differentiate between individuals with various levels of the procrastination latent trait. In the development of our scales, the evaluation of item parameters and their relation with the latent trait was done before the validation of the measure. We expected that a unidimensional item-response model for the items with graded response format would best fit the data. We also expected that the selected items would have acceptable to excellent discriminatory power and would cover a broad level of latent trait procrastination; the response options would capture nonredundant levels of severity. We also expected that the final measure would be free of items with gender bias, and that both the overall self-report and items would have a good to excellent level of reliability.

DEFINING HEALTH-RELATED PROCRASTINATION

There is a direct relation between how a construct is defined and operationalized and the construct validity of the measure of that construct, particularly in terms of its discriminant and convergent validity. Therefore, one of our central considerations was to differentiate health-related procrastination from overlapping and/or higher-order constructs at both the conceptual and operational level. There are many measures of health

behaviors that are widely used in research which might have conceptual overlap with health-related procrastination. For example, noncompliance with prescribed treatments or health-related behaviors (e.g., healthy diet) are used in medical research. In health research, a specific health-related behavior is often measured by a single item self-report of "delay" on the behavior or the frequency of engaging in the behavior (Sirois, 2007). All of these factors can be considered as indices of "health behaviors," but these should not be confused with procrastination on health-related behaviors.

Procrastination is a form of delay, but not all forms of delay (e.g., rational delay, delay due to conflicting intentions) are procrastination (Haghbin, 2015; Pychyl, 2013; Schouwenburg, Lay, Pychyl, & Ferrari, 2004). Having behavioral, cognitive, and emotional components, procrastination should be considered and operationalized as a "psychological construct" with a strong theoretical, conceptual, and empirical link to self-control, a volitional aspect of self-regulation theory (Kuhl & Beckmann, 1994; Tice & Baumeister, 1997; Sirois & Pychyl, 2013) and conscientiousness, a major personality trait (Lay, 1997; Lee, Kelly, & Edwards, 2006; Watson, 2001). An extensive literature review (Haghbin, 2015) suggested that two sets of components must be considered in defining and measuring procrastination. These consist of essential/primary components, including intention, delay, and irrationality (i.e., needlessness), and secondary components including negative emotions (e.g., distress and guilt) and dissatisfaction with the delay. Based on these components, we defined procrastination on health-related behaviors as a needless delay of the behaviors (or tasks), despite the initial intention to start or finish them, which is very often accompanied by negative emotions and personal dissatisfaction about the delay.

Researchers suggested that there is an indirect link between procrastination and health-related outcomes mediated by stress, health, and wellness behaviors (Sirois, Melia-Gordon, & Pychyl, 2003; Sirois, 2007) as well as by negative emotions associated with general and/or academic procrastination (Tice & Baumeister, 1997). However, these studies examined either general or academic procrastination and did not examine health-related procrastination and how it might have a differential effect on health-related outcomes. Consistent with the models that link personality traits to health (Sirois, 2007; Friedman, 2000), it can be argued that the effect on health-related outcomes could be due to a direct relation between health-related procrastination and health in addition to and/or instead of the indirect pathways between academic procrastination and health. Therefore, it was expected that health-related procrastination in comparison to general procrastination would have

a stronger unique relation with various health outcomes (e.g., BMI, health status), and the relation between other forms of procrastination and health outcomes would not be significant after removing the shared variance related to the effect of health-related procrastination (convergent and discriminant validity). Finally, in line with researchers that consider procrastination as a lower-order trait (Lay, 1997), there should be moderate to strong relations between exercise, diet, and general procrastination.

The two scales were developed in three studies using a multistage approach. The stages included item creation (including content analysis and refinement), evaluation of item functioning, and an exploration of the scales' validity. In the next sections, we first present the item creation and content analysis stages. We then present the method and the results of data analysis related to the process of item reduction and refinement (e.g., testing reliability and the unidimensional item response model), and finally the results of the validation stage are presented and discussed.

STAGES 1 AND 2: ITEM CREATION, EXPERT REVIEW, AND CONTENT VALIDITY

The first stage consisted of item generation, content validity analysis, and content refinement. Based on the literature review and theoretical distinctions between delay and procrastination, the items were developed to have important conceptual components that differentiate procrastination from other forms of delay. The necessary components included intention for action, intention-action gap or delay of an intended behavior/task, and the needlessness of the delay. Based on DeVellis' (2003) recommendation, we tried to develop items with approximately 16 or fewer words, unless it reduced the content validity of the item. Given the desired length of the measure for this study (developing a 3- to 5-item scale), we generated 26 items as an initial pool of items, again based on the recommendation of DeVellis (2003).

The content validity and quality of these items were evaluated by seven experts: three research psychologists who had at least 5 years of experience in procrastination research and/or measurement development, three graduate students who were taking a measurement course, as well as one upper-year undergraduate student who was familiar with procrastination and measurement research. The definitions and generated items of the newly developed questionnaire were presented, and the experts were asked to rate on a 3-point scale: (1) the relevance and clarity of the items and provide

a feedback on how representative the definitions and items were of the construct of interest, (2) how generalizable each item was, and (3) whether or not there was a level of redundancy in the items. When they rated the relevance or clarity of the item as low, our invited experts were also asked to rewrite the items to better reflect the construct as they understand it.

The average rating for clarity and representativeness was calculated. Any item with a mean of 2.75 or higher was considered to have an excellent relevance or clarity, an item with a mean of 2.5 was considered to have relatively good relevance or clarity, and an item with a mean below 2.5 was considered to have moderate/low relevance or clarity. The analysis showed that the most items had excellent content relevance (11 out of 13 items) and clarity (9 out of 13 items) according to the expert sample. The items with moderate to low clarity were rewritten based on the experts' feedback.

The qualitative feedback from the different experts was compiled for each item and compared. The pattern in the provided feedback was considered important as opposed to the idiosyncratic opinion of each expert. When more than one expert expressed a similar concern or provided a similar recommendation, this recommendation was considered and items were revised as necessary. Table 6.1 presents the revised items of the Exercise Procrastination Scale (EPS) after implementing the changes according to expert feedback. The items of the Healthy Diet Procrastination Scale (HDPS) were very similar to the EPS and therefore are not presented.

STAGES 2–4: DIMENSIONALITY, ITEM REDUCTION, RELIABILITY, AND VALIDATION

Dimensionality, item functioning, reliability, and validity of the Exercise Procrastination Scale and Healthy Diet Procrastination Scale were examined using community and student samples. The combination of samples was used in the factor analysis stage to evaluate dimensionality and in the item functioning analysis stage to select the optimal set of items. For validation, the relations of the refined version of new scales with personality, self-system, and health variables were analyzed in community and student samples separately.

The community sample, consisting of 110 participants (mean age 36.5 years, $SD = 14.29$), was recruited using e-mail and Facebook (Haghbin, 2012). The participants in the community sample filled out a small battery of questionnaires online that took between 5 and 20 min. The main measures in the study are described in the next paragraphs. No financial

Table 6.1 The exercise procrastination scale items after content analysis and item reduction stages

Number	The EPS items after content analysis stage
1	I engage in some unnecessary activities instead of doing regular exercise based on my initial plans.
2	***Instead of doing regular exercise according to my intentions, I involve myself in other activities that are not urgent.***
3	Instead of doing regular exercise (e.g., going to the gym) as I initially intended, I say I'll do it tomorrow.
4	I don't like to postpone doing regular exercise, but I end up putting it off without any rational reason.
5	I keep putting off regular exercise (e.g., going to the gym) until later without any rational reason.
6	**I plan on doing regular exercise (e.g., going to the gym) ahead of time, but I needlessly postpone it.**
7	I postpone doing regular exercise despite expecting to be worse off if I continuously delay.
8	**I would like to do regular exercise (e.g., going to the gym), but I habitually postpone it until later.**
9	***I intend to do regular exercise, but when the time comes, I postpone the task without a good reason.***
10	***I delay doing regular exercise despite the fact that I know I will not be happy about my delay later.***
11	I postpone doing regular exercise despite my general desire to do it.
12	I keep putting off doing my exercise program until later.
13	I delay on my exercise program despite the fact that I know I will feel guilty about my delay later.

Note: The bold and italicized items represent the final 5-item and 3-item versions of the EPS respectively. The instructions, key, and final versions of the EPS and HDPS can be obtained from Mohsen Haghbin. *(Copyright © 2016 Mohsen Haghbin. Published by Elsevier Inc. All rights reserved).*

incentives were provided to these participants. The student sample of 277 undergraduate students (mean age 19.9 years, *SD* = 3.69) was recruited through a secure online system at our university. The student volunteers completed a larger questionnaire package and received course credit as an incentive for their participation. Both samples consisted of approximately 70% of women and 30% of men, mostly of white, European decent.

Well-being and health was measured by various items including general status of health (3 items, 5-point Likert scale, sample item "In general, would you say your physical health is ...") and hours of weekly exercise. These measures also included cognitive aspects of well-being measured with the

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; 5 items, 7-point Likert scale, $\alpha = 0.90$; sample item: "I am satisfied with my life"), as well as emotional aspects of well-being measured by positive (10 items, $\alpha = 0.84$, sample item: "Proud") and negative (10 items, $\alpha = 0.90$, sample item: "Upset") affect scales of PANAS (Watson, Clark, & Tellegen, 1988).

Personality traits were measured with the Big Five Personality Inventory (BFI; John & Srivastava, 1999; Rammstedt & John, 2007). Participants used a 5-point Likert scale to rate items that measured neuroticism (2 items, sample item: "gets nervous easily"), agreeableness (2 items, sample item: "is generally trusting"), openness to experience (2 items, sample item: "has an active imagination"), conscientiousness (9 items, sample item: "does a thorough job"), and extroversion (2 items, sample item: "is outgoing, sociable"). The BFI has acceptable internal consistency and validity (John, Naumann, & Soto, 2008).

General or everyday-life procrastination was measure with the General Procrastination Scale (GPS: Lay, 1986) which measures trait or chronic procrastination on a 7-point Likert scale (20 items, $\alpha = 0.90$). The GPS has acceptable internal consistency and validity (Lay, 1986). A sample item is "I generally delay before starting on work I have to do."

Self-regulation was measured with the Short Self-Regulation Questionnaire (SSRQ, Carey, Neal, & Collins, 2004). It is a 31-item scale designed to assess self-regulation capacity across seven processes (5-point Likert scale, $\alpha = 0.93$). A sample item is "I am able to resist temptation."

Type-D personality was measured by the DS14 (Denollet, 2005). The DS14 uses a 5-point Likert-type response options set and provides two dimensions of type-D personality: negative affectivity (7 items, sample item: "I often make a fuss about unimportant things.") and social inhibition (7 items, sample item: "I often feel inhibited in social interactions."). Both dimensions have shown internal consistencies above 0.80 and test-retest reliability above 0.70 (Denollet, 2005).

Background information was measured with a Personal and Demographics Questionnaire. The questionnaire included information such as name, e-mail, gender, age, ethnicity, weight and height, marital status, and education.

DIMENSIONALITY AND ITEM REDUCTION

A set of advanced statistical methods was used to develop and evaluate the psychometric properties of the Exercise Procrastination Scale (EPS) and Healthy Diet Procrastination Scale (HDPS). Confirmatory factor analysis

(CFA) was used to check dimensionality. After assuring the unidimensionality, Samejima's graded response model (GRM), a parametric IRT technique suitable for rating scales, was used to analyze item and scale functions. Nonparametric IRT (i.e., Gaussian kernel smoothing) was used to evaluate the monotonicity of items. To assure that there was no measurement bias in favor of one gender group, item functioning between male and female samples was evaluated using both nonparametric (using visualization) and parametric (chi-square significance test) differential item functioning (DIF).

CFA, IRT, and DIF were performed for the two health procrastination scales, procrastination on physical activities and procrastination on healthy-diet programs, separately. Various IRT curves illustrating item psychometric functions were used in the decision-making process to select the best set of items including item characteristic curves (ICC), item information curves or functions (IIC, IIF), and test information curves or functions (TIC, TIF).

It is beyond the scope of this chapter to provide the details of the EFA, CFA, and IRT analyses. In the next sections only a brief summary of the analyses and curves used in the item reduction stage is presented. Readers may obtain detailed results of the analyses and the data by sending a request to Mohsen Haghbin.

Testing the unidimensional item response model. Before testing a graded response model, we tested two major assumptions of the model, unidimensionality and local independence. Exploratory and confirmatory factor analyses were used to test these assumptions. Both EFA and CFA supported the unidimensionality of the scales. For example, based on the EFA, a one factor solution explained 87% of variance among items related to healthy-diet procrastination. Local dependence between items was tested using CFA by looking at the correlations between the error terms. Correlations between error terms of four pairs of items were above 0.20, indicating a problem of local independence (Erhart et al., 2009). The findings related to the items with a local dependence problem were used in the process of item reduction. The chi-square tests for the graded response model in the Exercise Procrastination Scale ($\chi^2 = 1059.48$, $df = 1079$, $p = 0.66$) and Healthy Diet Procrastination Scale ($\chi^2 = 1102.94$, $df = 1079$, $p = 0.23$) were not significant, indicating acceptable models fit.

After assuring the models fit the data, we looked at the item parameters. Item discrimination statistics of all items were above 1, indicating that the items could adequately differentiate various levels of health related procrastination. The severity or difficulty parameters (*b*s) were different from one item to another item, spreading broadly from −2.5 to 2.5. Three items

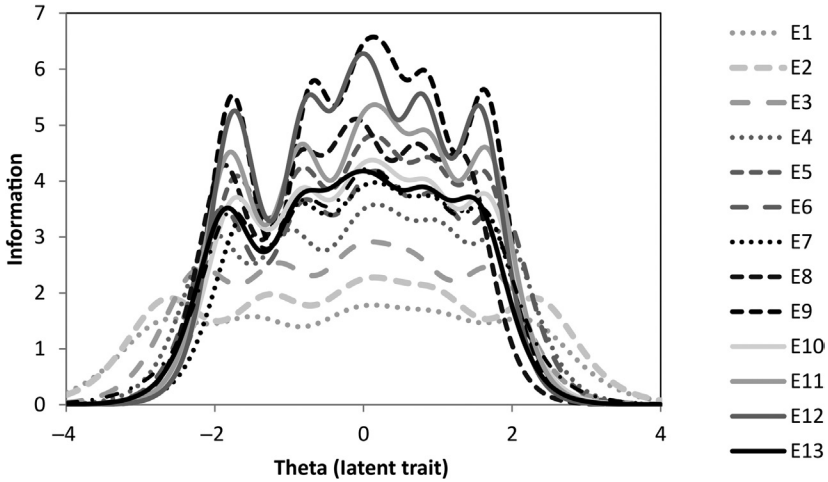

Figure 6.1 ***Item information curves of the initial EPS.***

from the initial item pools had significant chi-square indices of fit, indicating the items in the model did not fit the data. To evaluate the function of the 7-point Likert options, categories response curves (CRC) of the Exercise Procrastination Scale and the Healthy Diet Procrastination Scale were obtained based on the results of IRT. The order, location, and height of all response categories were appropriate. However, the middle response category was covered by other curves in the majority of plots. This indicated that the middle point in our 7-point Likert scale did not produce unique information in almost all of the items. Therefore, it was eliminated in future administration of the scales.

In the next stage of item-response analysis, item information curves were compared in order to select the best set of items. These curves were very helpful in the process of item reduction, therefore, we present these in greater detail. Fig. 6.1 shows the IICs of all the Exercise Procrastination Scale (EPS) items. Items 9, 12, 5, 8, and 11 had the highest information curve (noticeably above the average IIC). The height of items 10, 13, 6, 7, and 4 was above the average IIC. Items 1, 2, and 3 produced less information (more error) in comparison to other items. However, these items covered a large range of the exercise procrastination latent trait (Theta parameter). Several sets of items had similar IIC including items: (9 and 12), (7 and 4), (1 and 2), (5, 8, 11), and (10 and 13). This indicated that the items produce very similar information about the latent trait; therefore, only one of the items in each set was necessary to be kept, and the rest could be eliminated.

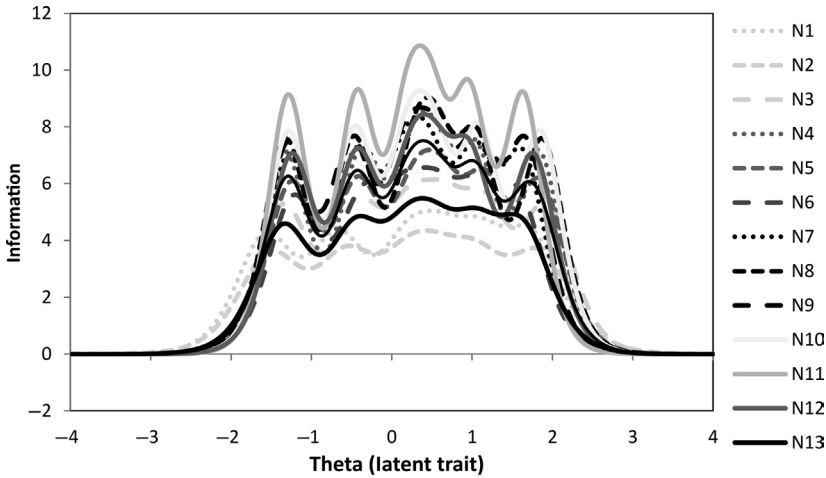

Figure 6.2 ***Item information curves of the initial HDPS.***

Item information curves for all Healthy Diet Procrastination Scale items are presented in Fig. 6.2. Items 11, 10, 9, 12, 8, and 7 had the highest (noticeably above the average) information curve, indicating maximum item information. Items 3, 5, and 6 curves were around the average line. Similar to the Exercise Procrastination Scale, items 1 and 2 had the lowest (below the average IIC) and widest information curve. Item 9 along with items 10, 7, 8, and 12 as well as item 1 with item 2 had very similar IICs.

Both parametric and nonparametric DIF were used to test for gender bias. Only two items had DIF problems. The final decision about item reduction was made based on the findings from parametric and nonparametric analyses of items and the theoretical and/or phenomenological distinction and similarities (i.e., item content area) of items. Local independence, item fit index, height and width of IICs, similarity of IICs, and problems in differential item functioning were considered for the selection of the best set of items. In this process, at the first stage, items with a flagged fit index and DIF problems were eliminated. These included items 1 and 12 of the EPS and items 5, 6, and 3 of HDPS. Among items with similar IICs or conceptual similarity, items with better IIC or other parametric indices were selected. The final 5-item EPS included items 2, 6, 8, and 10. The final HDPS included items 1, 7, 8, 9, and 10. Using a similar but more conservative criterion for the quality of item functioning, a 3-item version of the measure was selected.

Reliability of the EPS and HDPS. Cronbach's alphas for the 3-item and 5-item versions of the Exercise Procrastination Scale (EPS) and Healthy Diet Procrastination Scale (HDPS) were above 0.90, indicating internal

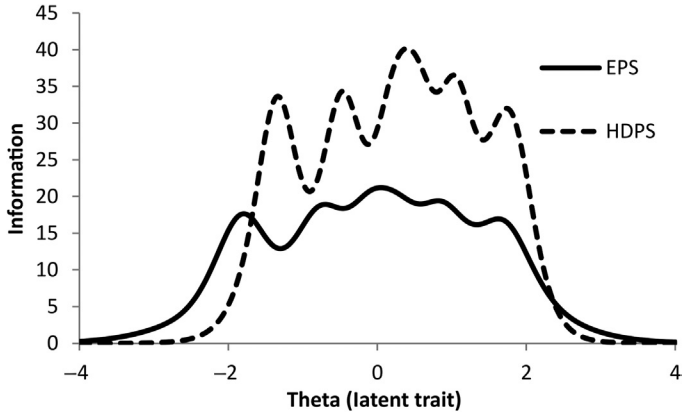

Figure 6.3 ***Test information function of the EPS and HDPS.***

consistency of the measures. The reliability of the scales was also evaluated in the IRT framework using test information curves. Fig. 6.3 presents the test information function of the 5-item EPS and HDPS. Both scales demonstrated excellent reliability in a broad range of Theta scores. The EPS coved a large range of latent exercise procrastination. Both scales performed well and were reliable in measuring high levels of the latent trait, procrastination. The difference was related to how the scales measured extremely low levels of procrastination. The HDPS did not measure very low levels of health-related procrastination as reliably as EPS. The results were similar when the item-information function of 3-item versions were studied and compared.

VALIDITY OF HEALTH-RELATED PROCRASTINATION MEASURES

The main purpose of the studies presented in this chapter was to develop and validate a Health-Related Procrastination Measure (HPM). As an example, two behavior-specific scales under the HPM were developed and analyzed. The first scale, the Exercise Procrastination Scale (EPS), was designed to measure needless delay on starting planned or intended physical activities. The second scale, the Healthy Diet Procrastination Scale (HDPS), was developed to measure needless delay on starting and/or maintaining an intended or prescribed healthy-diet program.

Pearson correlations were used to test validation hypotheses. Procrastination on health-related behaviors was expected to have a significant relation with conceptually similar indices of health behaviors such as the frequency

Table 6.2 Validation of the exercise procrastination scale

Hypothesis	Study 1 (*n* = 110)	Study 2 (*n* = 277)
Moderate, positive relationship with general procrastination	Supported (0.45[a])	Supported (0.41[a])
Negative relationship with conscientiousness	Supported (−0.27[a])	Supported (−0.40[a])
Positive relation with neuroticism	Supported (0.21[b])	Supported (0.26[a])
No relationship with extraversion	Supported (−0.08)	Supported (0.00)
No relationship with openness to experience	Supported (−0.03)	Supported (0.03)
No relationship with agreeableness	Supported (−0.10)	Supported (−0.09)
Negative relation with satisfaction in life	Supported (−0.41[a])	Supported (−0.17[a])
Negative relation with physical health	Supported (−0.48[a])	Supported (−0.40[a])
Negative relation with mental health	Supported (−0.45[a])	Supported (−0.20[a])
Positive relation with BMI	Supported (0.27[a])	Not Supported (0.11)
Negative relation with exercise		Supported (−0.28[a])
Self-regulation		Supported (−0.39[a])
Positive relation with Type D personality		Supported (0.24[a])

[a]0.01 significant at the 0.01 level (2-tailed).
[b]0.05 significant at the 0.01 level (2-tailed).

of exercise per week. However, it was also expected that there would be some differences between the correlates of health-related procrastination and the correlates of indices of health behavior. Procrastination on physical activity and healthy diet were expected to have a moderate to strong negative correlation with the measures of self-regulation and conscientiousness. Since we have considered an emotional component in the definition and operationalization of procrastination, it was expected we would find significant small to moderate negative associations between health-related procrastination and neuroticism as well as life satisfaction. No significant relations were expected with extraversion, openness to experience, and agreeableness. Tables 6.2 and 6.3 present a summary of the EPS and HDPS convergent and divergent validity hypotheses, testing the hypotheses in the community and student samples. All convergent and divergent hypotheses were supported with the exception of the association between exercise

Table 6.3 Validation of the healthy diet procrastination scale

Hypothesis	Study 1 (*n* = 110)	Study 2 (*n* = 277)
Moderate, positive relationship with general procrastination	Supported (0.34[a])	Supported (0.40[a])
Negative relationship with conscientiousness	Supported (−0.22[b])	Supported (−0.34[a])
Positive relation with neuroticism	Supported (0.27[a])	Supported (0.23[a])
No relationship with extraversion	Supported (0.01)	Supported (−0.01)
No relationship with openness to experience	Supported (0.07)	Supported (−0.05)
No relationship with agreeableness	Supported (−0.01)	Supported (−0.12)
Negative relation with satisfaction in life	Supported (−0.37[a])	Supported (−0.17[a])
Negative relation with physical health	Supported (−0.41[a])	Supported (−0.30[a])
Negative relation with mental health	Supported (−0.35[a])	Supported (−0.24[a])
Positive relation with BMI	Supported (0.22[b])	Supported (0.20[a])
Self-regulation		Supported (−0.39[a])
Positive relation with Type D personality		Supported (0.25[a])

[a]0.01 significant at the 0.01 level (2-tailed).
[b]0.05 significant at the 0.01 level (2-tailed).

procrastination and BMI. This relation was significant in the community sample but not significant in the student sample (Table 6.2).

The discriminant validity between exercise procrastination and healthy-diet procrastination and self-reported frequency of exercise was studied by comparing the significance and magnitude of the correlations between these measures and various personality and outcome variables in the student sample. The absolute magnitude of the correlations are illustrated in Fig. 6.4. There were noticeable differences among correlates of exercise procrastination, healthy eating procrastination, and frequency of exercise. However, the similarities between the correlates of EPS and HDPS—as two domain-specific scales of health-related procrastination—were more than the similarities between the correlates of EPS and the self-reported frequency of exercise. These findings supported the discriminant validity of the EPS and HDPS. The findings also explain why measuring health-related procrastination can provide unique information above and beyond a common measure of health behavior.

The associations of the 3- and 5-item versions of the EPS and HDPS with a similar set of personality and health outcome variables were compared

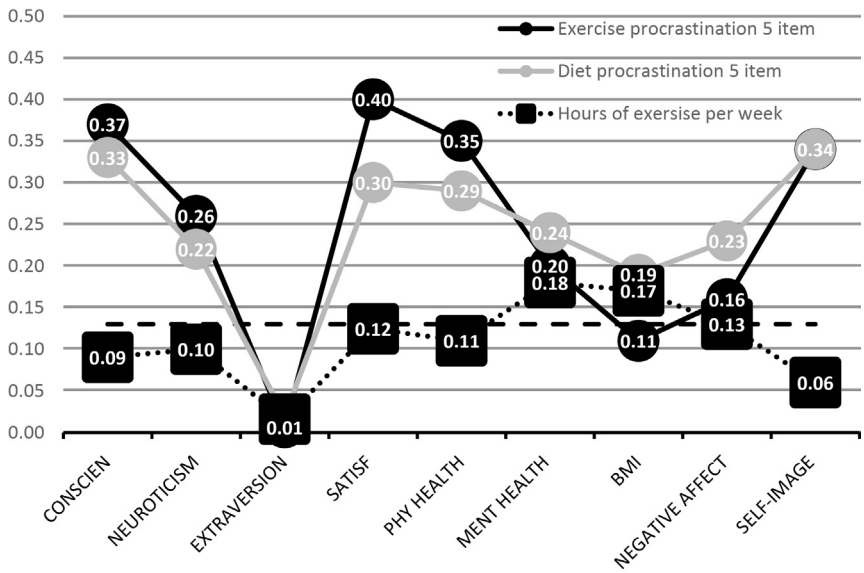

Figure 6.4 ***The magnitude of associations of the EPS, HDPS and self-reported frequency of exercise with personality and health factors.*** Note: The horizontal *dashed line* represents a significance threshold of $p < 0.05$. *CONCIEN*, Conscientiousness; *SATISF*, General Life Satisfaction; *PHY*, Physical; *MENT*, Mental.

(Fig. 6.5). The 3- and 5-item versions of the same health-related procrastination scales had very similar effect sizes.

As previously presented, we examined the validity of the new measure from two different angles: how health-related procrastination scales (i.e., the Exercise Procrastination Scale and Healthy Diet Procrastination Scale) could be positioned in personality and self-regulation theories (i.e., validity of scales as dependent variables), as well as how they could predict important health outcomes, different from other health behaviors (i.e., validity of the scales as independent variables). These results are discussed and compared with existing theoretical and empirical information in the next sections.

ANTECEDENTS OF PROCRASTINATION: PERSONALITY AND SELF-REGULATION

Personality and self-regulation are two major areas of psychological research that have been used to explain why a person might irrationally delay an intended behavior or task despite knowing the probable unwanted and negative consequences of the postponement. We examined the relation between health-related procrastination and these two sets of causal constructs and

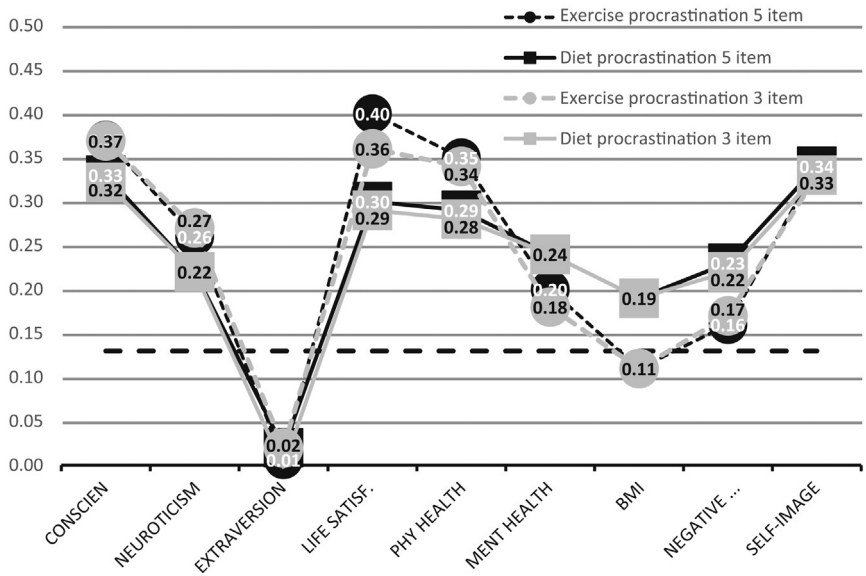

Figure 6.5 ***The magnitude of associations of the 3- and 5-item EPS, and with personality and health factors.*** Note: The horizontal *dashed line* represents a significance threshold $p < 0.05$. *CONCIEN*, Conscientiousness; *LIFE SATISF*, General Life Satisfaction; *PHY*, Physical; *MENT*, Mental; Negative, Negative Affect.

processes. Consistent with Lay (1997), the associations of general procrastination and conscientiousness with exercise and diet procrastination were statistically significant and practically noticeable. It is important to note that, similar to Conscientiousness and approximately at the same level of effect size but in the opposite direction, Neuroticism had a significant contribution in predicting health-related procrastination. These findings may need to be considered when positioning health-related procrastination within the Big Five personality model and when developing interventions for individuals who procrastinate on health-related behaviors. It can be argued that intervention programs should not only target the enduring tendencies related to low self-discipline and dutifulness (i.e., important facets of Conscientiousness), but also target impulsivities and excessive emotional sensitivity (facets related to Neuroticism). It is difficult to overcome problems that are directly rooted in personality traits such as procrastination. However, it can be argued that people are more likely to "act out of character" (i.e., act as if they were more conscientiousness) if they become aware of the enduring force behind their irrational delay, and if they are repeatedly reminded of the importance of the targeted behaviors or prescribed tasks to enhance or maintain their health and well-being (Little, 2000). In addition, for those with a high level

of impulsivity and emotional sensitivity, environmental factors might play an additional intervening factor to reduce procrastination. An environment with lower availability of unhealthy foods, for example, may significantly facilitate the decrease in healthy-diet procrastination.

In line with researchers who indicated that procrastination is rooted in self-regulation problems (Tice & Baumeister, 1997; Senécal, Koestner, & Vallerand, 1995; Wolters, 2003), the correlations between self-regulation and exercise and diet procrastination were significant and in a negative direction. The magnitude of association for both scales were similar and was considered a moderate effect size. Based on the results, it can be argued that both procrastination scales measure a form of failure in self-regulation as conceptualized and discussed by Sirois and Pychyl (2013). These findings related to personality and self-regulation factors supported the construct validity (i.e., convergent) of the scores obtained from the new scales.

HEALTH-RELATED PROCRASTINATION AND HEALTH OUTCOMES

To support the validity of the new scales and their application in the health domain, we investigated the relation between the new scales and a set of well-known and widely used health outcomes such as health status and BMI, as well as risk-factor variables such as Type-D Personality. All of the validity hypotheses related to health outcomes were supported with the exception of one hypothesis. The relation between exercise procrastination and BMI was supported in the community sample, but did not reach statistical significance in the student sample. The difference in the association between the two samples may be due to two reasons. First, there was mean age difference of 16.6 years between the two samples, and given a higher level of metabolism and possibly higher levels of everyday life activities in the student sample, it can be speculated that procrastination in intended exercise activities did not have a similar significant adverse effect on BMI. Second, the BMI index is not an accurate measure because it does not take into account important variables such as muscle mass and bone density. It can be speculated that using and comparing such a measure in a sample with limited variation in age (student sample; $M = 19.9$ and $SD = 3.69$) and limited size (i.e., community sample) may have resulted in this discrepancy. Therefore, the findings should not be generalized given the limitation of samples and measures. The relation of BMI and other measures of fitness (e.g., waist circumferences) with exercise procrastination should be studied

and compared between different gender and age groups and in larger samples in the future research.

It is important to discuss the findings related to health outcomes in light of existing theoretical models in order to deepen our understanding of the link between procrastination and health. The procrastination-health model (Sirois et al., 2003; Sirois, 2007; see Chapter 1, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being) suggested that there is a link between procrastination and physical health. Similar to these studies, the associations of procrastination scales in our study with health status were significant. It should be noted that the major focus of the procrastination-health model is on the relation between general procrastination (considered as trait procrastination) and health. The model predicts an indirect association between trait procrastination and physical health/illness. From this point of view, the effect of trait procrastination on physical health is mediated through health behavior and stress.

The health-related procrastination measure and physical health constructs are from the same domain (i.e., health); the association between the measures of the constructs showed moderate effect sizes based on our studies (Tables 6.2 and 6.3). The conceptual and empirical evidence implies that health-related procrastination affects physical health directly (i.e., no mediation path). If this is true, the health procrastination constructs measured by the Exercise Procrastination Scale (EPS) and Healthy Diet Procrastination Scale (HDPS) may be positioned beside or instead of wellness behaviors in the procrastination-health model (Sirois, 2007). More specifically, we believe that low trait conscientiousness, as described in the Five Factor Theory of Personality (McCrae & Costa, 2008), results in health-related procrastination (a manifestation of trait procrastination on health-related behaviors and tasks), which in turn results in lower physical health and higher rates of illness. Based on this argument, the association of general and academic procrastination with physical health found and discussed in other research (Sirois, 2007; Tice & Baumeister, 1997) might be due to the share variance of general and academic procrastination with exercise and diet procrastination and their similar causal factors. In other words, a person who has a low level of conscientiousness and self-regulation capability is more likely to procrastinate on multiple tasks across multiple domains including general, academic, and health behaviors. However, only irrational delay on *health-related* behaviors can have a negative *direct* effect on personal health. Irrational and unwanted delay on other tasks such as "academic" and "everyday-life" tasks may have *indirect* effects on health. As the procrastination

health model suggests (Sirois et al., 2003; Sirois, 2007), for example, procrastination on these tasks can potentially cause a noticeable amount of stress, which in turn may negatively influences physical health.

We used the data collected to provide preliminary empirical evidence for the above speculations. Hierarchical multiple regression was used to test to what extend health related procrastination may mediate the effect of Conscientiousness on health. The results showed that exercise and diet procrastination fully mediated the relation; the percentage of explained variance significantly changed after adding the health procrastination scales in the model (ΔR^2 = 23% and 12% in community and student samples, respectively; $p \leq 0.05$). Semipartial correlation of the EPS with Conscientiousness was -0.30 and -0.25 in community and student samples, respectively, while semipartial correlations of the HDPS with conscientiousness were -0.19 and -0.06 in community and student samples, respectively. Based on these results, exercise procrastination seemed to play a more consistent and stronger mediating role in comparison to healthy-diet procrastination.

Similar findings were found when general procrastination and health-related procrastination were used in a regression model that explained the association between procrastination and health status. The association between general procrastination and health was not significant after adding health-related procrastination in the regression mode. The results indicated that general procrastination may not have any unique association with health over and above health-related procrastination. These findings highlight the theoretical and practical importance of measuring and studying different manifestations of trait procrastination when studying the effect of procrastination on outcome variables. Our speculations regarding direct and indirect effects, however, require future investigation, where stress and various forms of procrastination are included in the investigation.

CONTEXT-SPECIFIC MEASURES OF HEALTH-RELATED PROCRASTINATION

The HPM scales (the Exercise Procrastination Scale and Healthy Diet Procrastination Scale) were developed to be task-specific measures. The findings of our studies supported the psychometric functioning of the scales. Psychometric studies related to procrastination in other domains demonstrated that the structure and psychometric properties of similar task-specific procrastination measures were similar across tasks within the same domain (Haghbin, 2015). Given the similarities in the results related to the

Exercise Procrastination Scale and the Healthy Diet Procrastination Scale, the general approach to the development of the Health-Related Procrastination Measure can potentially be adapted to capture procrastination on other health behaviors. For example, researchers may substitute exercise or healthy-diet programs with other health behaviors or tasks such as scheduling an annual medical check-up, scheduling an appointment with and/or going to see a doctor about a particular issue, or regular health routines such as teeth flossing or medication routines. However, it is important to note that the adapted scales for other health behaviors should be used with caution until specific psychometric data are collected and further validity evidence is provided.

FUTURE DIRECTIONS AND CONCLUDING THOUGHTS

Construct validation is a long-standing research project requiring multiple studies and the ongoing development of an argument for the instrument's validity. It will be beneficial for future research to compare the correlates of health-related procrastination with those related to other indices of wellness behaviors. It would also be beneficial to translate, test, and compare the items' functions and properties in other cultures or between demographic groups. At the same time, the new scales can help deepen our theoretical understanding of procrastination. For example, it would be informative to compare the relation of procrastination in various domains (e.g., health, general, and academic) with health outcomes and risk factors in future research.

Despite the ongoing need to continue the psychometric evaluation of measures of this sort, we are able to conclude that there was a statistically and clinically meaningful association between the health-related procrastination scales and various health factors. The findings summarized in this chapter suggest that the new measures can be used to identify those who delay adhering to their prescribed or self-planned exercise or healthy-eating programs because of procrastination tendencies (i.e., self-regulation problem). Furthermore, our analyses indicate that the measures allow us to differentiate health-related procrastination from those whose nonadherence is related to other psychological problems (e.g., mental disorder) or nonpsychological factors (e.g., situational factor). We believe that such a differentiation can potentially help to develop and implement more effective interventions to enhance adherence and reduce related health problems (e.g., coronary heart disease and diabetes).

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CHAPTER 7

The Relation Between General Procrastination and Health Behaviors: What Can We Learn from Greek Students?

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INTRODUCTION

Mary is a third-year university student at Athens University. She has been admitted to the Faculty of Literature after very competitive and demanding examinations. She describes herself as "a person of the last minute" when having to meet deadlines or complete everyday activities. She usually feels bad when waking up in the morning. She expresses the wish to exercise more, although she finds exercising very boring. She also has the tendency to eat fast food. She drinks mostly in social situations and when she feels anxious or depressed. She is a smoker, but she does not want to give up smoking. In many ways, Mary is a typical student who has the tendency to procrastinate and feels dissatisfied with her dysfunctional health behaviors, but finds it difficult to adopt a healthier lifestyle, despite her original intentions.

Becoming a university student represents an important step toward adulthood for most young people (Montgomery & Côté, 2003). University life offers a wide range of experiences that challenge students' identity and self-perception and offer new alternatives to the formation of adult identity (Waterman, 1993). Worldwide, students represent an almost homogenous group of 18–25 years of age, who are preparing themselves for the labor market. Successful completion of undergraduate and postgraduate studies enables them to enter high standard professions and includes them in a country's potential intellectual groups (Kalantzi-Azizi, 1998). Student participation rates differ among countries. For example, in the United States of America, 69% of high school students are admitted to institutions of higher

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education (Feldman, 2010). In Greece, 30% of youth (about 450,000) become university students. Those rates are among the highest in the EU states (Efthimiou, Efstathoiu, Kalantzi-Azizi, 2007).

In this chapter, we argue that university life is linked to important lifestyle changes and challenges that could threaten students' psychological balance. After summarizing theory on university students' psychological characteristics, we review previous research suggesting a link between procrastination and dysfunctional health behaviors. Finally we present data from a study of Greek university students supporting this claim.

Students and Emerging Adulthood

Being admitted to the university represents a "critical incidence" in the life of every student. Student identity is linked to important lifestyle changes, but it also threatens students' psychological balance (Kalantzi-Azizi, 2008a, 2008b). According to the recent developmental theory of Jeffrey Arnett (2000, 2003, 2008), the period from 18 to 25 or even 28 years of age, which coincides with the age of most students, constitutes a distinct phase of the life span that is called emerging adulthood. According to this theory, young adults in developed countries share some special characteristics that differentiate them from both adolescents and adults. Emerging adults have not created their own family or home yet; they are not financially independent and they do not have a permanent job or profession. An important goal of this period is the acquisition of adult identity. More precisely, they display five major characteristics: (1) identity exploration, resulting in defining their future needs, goals or plans; (2) instability/negativity (e.g., repeated changes in residence, friends, partners, professional options); (3) self-focus, namely they try to explore their identity and goals, before getting restrained by a family or a precise career; (4) exploration of possibilities, experimentation, and greater optimism, in the sense that all future options remain open; and finally, (5) the feeling of "in-between," namely the fact that most emerging adults report that they do not feel like teenagers, but at the same time they do not feel ready to adopt an adult identity or take up all the responsibilities of adult roles. In fact, emerging adulthood constitutes a "paradox"—simultaneously being a period of high mental and physical well-being, but also a phase of increased vulnerability. It is thus evident that emerging adults need to cope with important developmental, emotional, and cognitive challenges.

University students, in particular, need to cope with more challenges than their peers, who are also emerging adults, but who have already

entered the labor market and have consequently assumed adult roles earlier (Efthimiou et al., 2007). The existence of a supportive network, the acquisition of coping and problem-solving skills and the tendency to socialize are some variables that could facilitate students' adjustment (Kalantzi-Azizi, 2008a, 2008b). The need for new study behaviors, the transformation of their relationships with friends and kin, the formation of new relationships, and the development of new personal values represent an extra burden for most students (Holm-Handula, Hofmann, Sperth, Funke, 2009).

Because of all these challenges, students are considered a high-risk group for developing adjustment difficulties (Dyson & Renk, 2006), somatic symptoms, psychological distress, and mental health problems (Efthimiou et al., 2007). According to some epidemiological studies, psychopathology rates among students range from 6–15% (APA, 1994, 2000), and they have increased in recent years (Benton, Robertson, Tseng, Newton, Benton, 2003; Holm-Handula et al., 2009). According to the most recent Greek epidemiological study on university students' mental health (Efthimiou et al., 2007), up to 1 of 6 male students and up to 1 of 5 female students could be considered as a potential case for developing a psychological disorder. This rate is 1.5 to 2 times higher compared to the general population.

Health Behaviors and Procrastination Among Students

University life and emerging adulthood are potential risk factors for the adoption of dysfunctional dietary practices (e.g., binge eating), resulting in weight gain and obesity. In fact, the onset of eating disorders such as bulimia nervosa or binge-eating disorder occurs during this transitional phase due to the high frequency of weight loss/control behaviors, the dissatisfaction with body image and peer's attitudes regarding unhealthy behavior (Hoerr, Bokram, Lugo, Bivins, & Keast, 2002; Vohs, Heatherton, & Herrin, 2001). Students' dietary behavior is associated with dysfunctional dietary perceptions, low body-image satisfaction, adjustment difficulties, and sleep disturbances (Nelson & McNamara-Barry, 2005). Other researchers also suggest that university students report higher levels of alcohol use as well as occasional to regular episodes of drunkenness in comparison to their peers (Colby, Colby, & Raymond, 2009). Alcohol use is reduced at the end of university studies, after the acquisition of the adult identity and the assumption of adult responsibilities such as a full-time job, marriage, and family (Arnett, 2000). Other risky health behaviors such as smoking,

high-speed driving or driving while being drunk, as well as sex without precautions also initiate during this period. These behaviors are seen in the context of identity exploration, and are motivated by the need to live important experiences before getting constrained by adult roles. Occasional alcohol consumption, smoking, and substance use also represent some of the coping behaviors for daily stressors that students experience. Subsequently, nutrition and exercise attitudes are influenced by those behaviors and lead anew to dysfunctional coping techniques, resulting in an increased risk for developing a chronic disease in the future (James, 2010). Fortunately, risky behaviors tend to decline as emerging adults grow older and adopt new adult roles (Arnett, 2000).

Procrastination, characterized by self-regulation difficulties in the form of delaying the start and/or completion of necessary and important tasks (Ferrari, 2010; Ferrari & Tice, 2000), also constitutes an integral part of students' everyday life. According to the results of two meta-analyses, men and young people are more likely to procrastinate, in comparison to women or older people (Steel, 2007; Van Eerde, 2000). Internationally, it is estimated that 20–25% of adult men and women could be characterized as chronic procrastinators (Ferrari, O'Callaghan, & Newbegin, 2005; Harriott, Ferrari & Dovidio, 1996). In a Greek study among university students, 47% of the participants identified themselves as chronic procrastinators (Argiropoulou, 2015). Moreover, academic procrastination constitutes one of the most common and serious problems of university students, both in Greece and internationally. It is estimated that 80–95% of students procrastinate at some point of their lives (O'Brien, 2002), 75% of them believe that they procrastinate toward meeting their study obligations (Potts, 1987), 50% systematically procrastinate (Day, Mensink, & O' Sullivan, 2000; Haycock, 1993; Micek, 1982; Onwuegbuzie, 2000; Solomon & Rothblum, 1984), and 40% of students report more serious difficulties (Rothblum, 1990). Prevalence of academic procrastination among Greek university students is also high. According to the results of a recent study, 40.5% of students self-identified as frequent academic procrastinators (Argiropoulou, Kalantzi-Azizi, & Ferrari, in press).

There are two main traditions in studying procrastination (Johnson & Bloom, 1995). Some researchers view procrastination as a stable personality trait (Ferrari, Johnson, McCown, 1995; Schouwenburg & Lay, 1995; Van Eerde, 2000), while others study procrastination as a behavior closely related to the characteristics of a given situation or task (Harris & Sutton, 1983; Rothblum, 1990; Van Eerde, 2000). One of the most stable findings derived

from the first line of research is that there is a strong negative relationship between procrastination and conscientiousness (Lay, Kovacs, & Danto, 1998; Lee, Kelly & Edwads, 2006; Milgram & Tenne, 2000; Schouwenburg & Lay, 1995; Steel, 2007; Van Eerde, 2003; Watson, 2001). In contrast, a positive relationship has been found between procrastination and neuroticism (Van Eerde, 2003; Johnson & Bloom, 1995; Milgram & Tenne, 2000; Schouwenburg & Lay, 1995; Steel, 2007; Steel, Brothen, & Wambach, 2001; Watson, 2001). One of the most stable findings from studies that examine situational correlates of procrastination is its relationship with task attractiveness (Steel, 2007) and time distance from reward (Schouwenburg & Groenewoud, 2001; Strongman & Burt, 2000).

Procrastination is also positively associated with stress (Sirois, 2007; Sirois, Melia-Gordon, & Pychyl, 2003; Tice & Baumeister, 1997). Accordingly, procrastination can be conceptualized as a personality trait that increases illness risk, since procrastinators not only experience more stress caused by constantly putting off necessary and important tasks, but they are also less likely to practice health behaviors (Sirois et al., 2003). As Sirois (2007) points out in describing the procrastination-health model (see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective), a possible explanation for this could be found in Suls and Rittenhouse's (1990) "personality as a predictor of dangerous behaviour" model, suggesting that certain personality traits—that are typical of procrastinators, such as increased levels of neuroticism and low levels of conscientiousness—lead to more exposure to situations that elicit reactivity, create unnecessary stress, increase the tendency of an individual to engage in unhealthy or risky behaviors, hinder preventative behaviors and compliance with medical regimens, and thus increase illness risk. Other studies also indicate that stress negatively affects wellness behaviors (Baum & Posluszny, 1999; Hudd et al., 2000; Steptoe, Wardie, Pollard, & Canaan, 1996), especially among students (Hudd et al., 2000; Lawrence & Schank, 1993). In fact, previous research suggests that procrastination is associated with less frequent practice of wellness behaviors (e.g., healthy dietary habits, exercise; Sirois, 2004a, 2004b; Sirois et al., 2003), because they are perceived as challenging or unpleasant (Turk & Meichenbaum, 1991). Procrastination is also associated with more frequent practice of unhealthy behaviors (e.g., smoking, substance use; Sirois & Pychyl, 2002), delays in treating health problems, fewer household safety behaviors, less frequent dental and medical check-ups, and more acute health problems (Sirois, 2007; Sirois et al., 2003; Sirois

& Pychyl, 2002). Finally, procrastinators tend to use avoidant coping styles, such as drug or alcohol consumption, in an effort to cope with stress (Sirois & Kitner, 2015; Sirois & Pychyl, 2002).

Procrastination and Health Behaviors in Greek University Students

Our study of Greek university students expands the range of health behaviors previously investigated in connection with procrastination among university students, and uses an alternative more detailed measure to assess them. This study is one of the first attempts to investigate health behaviors and procrastination among Greek university students, a population largely neglected in previous literature. We included a wide range of health behaviors in more diverse areas, such as nutrition, smoking, alcohol consumption, exercise, sleep, and medication intake, as well as more general indicators of health and well-being. More importantly, in this study we investigated both health-promoting and negative health behaviors, as well as the reasons for engaging in such behaviors accompanied by students' personal evaluations regarding their behavior. We also explored the relationship between procrastination and the degree of knowledge regarding medical conditions caused by deficient health care or abuses in each domain. Moreover, we explored the relations between procrastination and students' intentions to alter their behavior, the possible internal and external barriers to change, the resources as well as the subjective difficulty to attain the goal of change.

Our sample consisted of 60 (42.6%) male and 81 (57.4%) female Greek university students (N = 141) studying in Athens University, Greece. The mean age of participants was 24.3 years. The majority of participants (87.8%) were undergraduate students, 10.8% were postgraduate students and a 1.4% were PhD students. Most of the students were living either with their parents (52.1%) or alone (23.6%), while fewer were living with their partner/husband (10%), or in other arrangements (14.3%). The mean number of courses failed was 5.8 (ranging from 0 to 43). Participants were recruited using the snowball sampling technique. Although all students were volunteers with no remuneration for participation, 90% of the students agreed to participate in the study after informed consent.

After completing a demographic sheet, participants rated the Greek version of Lay's (1986, translated into Greek by Argiropoulou, 2015) General Procrastination Scale on a 5-point Likert scale (1 = *not at all true*; 5 = *totally true*). In the present study, the GP scale demonstrated satisfactory reliability

(Cronbach's $\alpha = 0.87$). Participants also completed the Greek version of the Inventory for the Investigation of Behavior in Health Related Issues (Fragebogen zur Erfassung des Gesundheitsver-haltens, FEG Dlugosch and Krieger, 1995) translated into Greek by Sofianopoulou and Kalantzi-Azizi (2012). The questionnaire consists of 85 items aiming to describe behaviors and opinions directly related with health as well as with the intentions or wishes of participants to change their behaviors. This inventory examines seven domains, namely: (1) Nutrition, (2) Smoking, (3) Alcohol consumption, (4) Exercise, (5) Sleep, (6) Medication intake, and (7) Health and well-being. The first six subscales contain both health-promoting and negative health behaviors. In addition to ratings, participants were asked to give reasons why they engage in such behaviors and to assess their behavior. Their degree of knowledge regarding medical conditions caused by deficient health care or abuses in each domain was also evaluated. Finally, the intention to alter behavior, the possible internal and external barriers to change, the resources as well as the subjective difficulty to attain the goal of change were also assessed. In the final subscale, both global and present well-being were assessed followed by: (1) the assessment of life domains affecting life satisfaction or currently being dysfunctional, (2) dissatisfaction from this dysfunction, (3) knowledge about medical conditions caused from dysfunction in the domains, (4) wish to make changes in problematic domains, (5) external resources for change, (6) internal resources for change, (7) internal barriers to change, (8) external barriers to change, (9) difficulty to change, (10) possibility to change as finally, and (11) attitudes toward health and illness. Depending on the content, participants were asked to answer using either 4-point Likert scales ranging from 1 = *never* to 4 = *every day/more than once daily*; or 5-point Likert scales ranging from 1 = *totally disagree/very little/never* to 5 = *totally agree/very much/very often*; or 7-point Likert scales ranging from −3 = *very dissatisfied/very negatively* to 3 = *very satisfied/very positively*). In other instances, participants were asked to choose one or more answers from several closed-ended alternatives.

The reliabilities (Cronbach's alpha) of the subscales in each domain in the current study ranged as following: (1) Nutrition: from 0.51 to 0.80 with the exception of frequency of regularity of daily meals, which demonstrated very low reliability (0.21); (2) Exercise: from 0.53 to 0.67; (3) Alcohol consumption: from 0.43 to 0.82; (4) Medication: from 0.42 to 1, except for stress as a reason for taking medication scale which demonstrated an extremely low reliability (0.17); (5) Smoking: from 0.72 to 0.87; (6) Sleep: from 0.59 to 0.84; and finally, (7) Well-being: from 0.56 to 0.91.

Participants' mean procrastination score was 55.30 (*SD* = 12.93). To estimate the correlation between general procrastination and the different subscales of the Inventory for the Investigation of Behavior in Health Related Issues, we calculated Pearson's product moment correlations between GP and the respective scales. Before running the correlational analyses, the 36 items of the Nutrition scale were subjected to principal component analysis with varimax rotation. The rotated solution revealed the presence of three factors that explained 29.13% of the total variance. The first factor which explained 11.02% of the total variance consisted of 14 items and focused on "full-fat/high-calorie food." A second factor consisted of 10 items and explained 9.23% of the variance. This factor focused on "low-fat/low-calorie food." Finally, the third factor consisted of 8 items and focused on "healthy food," explaining 8.81% of the variance. The three factors correspond both in number and in content to the original scale.

Correlational analyses revealed that there were no significant correlations between students' level of procrastination and the three factors (Table 7.1). However, some significant correlations emerged between general procrastination and individual items of the scale. More precisely, procrastinators tended to consume more precooked/frozen meals ($r = 0.17^{\star}$) and low-calorie cheese ($r = 0.17^{\star}$), and they tended to drink more coffee and tea ($r = 0\ .19^{\star}$) than nonprocrastinators. Procrastinators consumed significantly less fruits ($r = -0.22^{\star}$) and honey/marmalade ($r = -0.18^{\star}$). Surprisingly, they also reported less uncontrollable consumption of food ($r = -0.29^{\star\star}$) and less of a tendency to use food as a means to regulate negative emotions ($r = -0.26^{\star\star}$). No significant correlations were found between procrastination and frequency of eating out ($r = -0.17$), regularity of daily meals ($r = 0.05$) or tendency to eat more during social situations or in order to boost good mood ($r = -0.05$). Procrastinators did report significantly less satisfaction with their dietary habits ($r = -0.20^{\star}$)

Table 7.1 Means, standard deviations (SD) and pearson correlations (*r*) between general procrastination and nutrition factors

	Health behavior questionnaire		
Nutrition factors	**Mean**	**SD**	**General procrastination (*r*)**
Full-fat/high-calorie food	34.55	5.56	0.12
Low-fat/low-calorie food	23.40	5.13	0.08
Healthy food	21.04	3.38	−0.17

Table 7.2 Means, standard deviations (SD) and pearson correlations (*r*) between general procrastination and exercise section subscales

	Health behavior questionnaire		
Exercise section	**Mean**	**SD**	**General procrastination**
Frequency of exercise/sports	16.10	4.08	−0.25
Reasons for exercising			
Negative emotions regulation	6.22	2.28	−0.15
Being with others/feeling good	14.94	2.94	−0.27**
Satisfaction with amount of exercise	1.75	2.74	−0.33**
Knowledge of illnesses due to lack of exercise	142.43	23.57	−0.29**
Wish to increase exercise	7.95	1.94	0.19
Make changes with help from others	12.62	1.24	−0.28**
Make changes on one's own self	1.17	0.38	−0.06
Internal barriers to change	9.86	1.16	−0.22*
External barriers to change	10.72	1.20	−0.10
Difficulty to change	3.02	0.96	0.13
Possibility to change	3.61	0.99	0.10

Note: $^{*}p < 0.05$, $^{**}p < 0.01$.

and less accurate knowledge regarding the illnesses that are related to nutrition ($r = -0.18^{*}$). However, there were no significant associations between the level of procrastination and the wish to change one's dietary habits ($r = -0.03$), either with the help of others ($r = -0.20$) or based on one's self ($r = -0.09$). Procrastinators perceived significantly less internal barriers to change their dietary habits ($r = -0.32^{**}$), while no correlations were found between procrastination and external barriers to change ($r = -0.05$), perceived difficulty to change ($r = 0.09$), or perceived possibility to change ($r = 0\ .09$).

Procrastination was unrelated to the frequency of exercising or time spent playing sports or the tendency of individuals to exercise as a means of regulating their negative emotions (Table 7.2). However, procrastinators were less likely to perceive exercise as a way of being with other people or feeling good, while at the same time they were significantly less satisfied with the amount of their exercise and they had less accurate knowledge of the illnesses caused due to the lack of exercise. Moreover, despite the fact that procrastination was unrelated to one's wish to increase exercise, procrastinators were less likely to believe that others could help them change

their exercise habits and tended to perceive less internal barriers to change (see Table 7.2 for further details).

As for the relations between general procrastination and substance and medication use, results indicated that procrastinators did not consume alcohol more frequently than nonprocrastinators ($r = 0.15$). However, they were more likely to drink when they felt bad in order to regulate their negative emotions ($r = 0.29^{**}$), and have a greater wish to drink only on special occasions ($r = 0\ .49^{**}$). As far as procrastination and other alcohol subscales, no significant correlations were found. No significant correlations were found between general procrastination and smoking habits. Procrastination was also not significantly related to most of the Medication subscales. In fact, the only statistically significant correlations that were found regarding medication indicated that procrastinators were less likely to turn to pills when having stress ($r = -0.44^{*}$) or feeling bad ($r = -0.38^{*}$).

With respect to sleep, results revealed that procrastinators more frequently felt bad when waking up ($r = 0\ .19^{*}$), and they reported more difficulty changing their sleeping patterns ($r = 0.32^{**}$). No significant correlations were found between procrastination and other sleep subscales. Finally, procrastinators reported significantly less life satisfaction both in the present ($r = -0.26^{**}$) and in general ($r = -0.25^{**}$).

WHAT CAN WE LEARN FROM GREEK UNIVERSITY STUDENTS?

Our data from Greek university students suggest that high procrastinators are less well informed regarding the illnesses caused by deficient self-care in each of the six domains examined (Nutrition, Exercise, Alcohol consumption, Medication, Smoking, Sleep, and Life situations negatively affecting well-being). Despite the fact that procrastinators were more likely to experience dissatisfaction with their health behaviors, this dissatisfaction did not, however, lead to a greater wish to change these habits. Some scholars (Ferrari et al., 1995) have perceived procrastination as an avoidance strategy aiming to protect self-esteem. It is thus possible that procrastinators avoid any information suggesting that their behavior could negatively impact their health, while at the same time they are less likely to admit to any internal barriers to change their unhealthy habits. Such change would go against their preference for activities that are immediately rewarding (Pychyl, Lee, Thibodeau, & Blunt, 2000) and pleasurable (Ferrari & Emmons, 1995). This dysfunctional attitude toward health behaviors during university life could

later lead to a greater avoidance to seek treatment for health problems. Besides, procrastinators are well known for their tendency to act against their future goals (Baumeister, 1997; Ferrari, 2001).

Procrastinators were also more likely to adopt dysfunctional health behaviors to regulate their negative emotions, such as drinking when feeling bad. This is in line with previous findings suggesting that procrastinators use more avoidant coping styles, specifically drug and alcohol, to cope with stress (Sirois & Pychyl, 2002). Surprisingly, procrastination was unrelated to the consumption of unhealthy food types. This could be explained by the fact that Greek students continue to stay with their parents after entering university, as most of them are not financially independent. Moreover, Greek parents keep preparing meals for their children even after they have moved out to live on their own. Therefore, Greek students are not fully responsible for their dietary choices. On the other hand, many students choose to have their lunch or dinner at the university's restaurants, which may promote healthier dietary habits. It is also well known that the traditional dietary patterns of Greece are following the Mediterranean diet, which incorporates the basics of healthy eating.

Interestingly, procrastinators were less likely to perceive exercise as a way of being with other people or feeling good. It is thus possible that procrastinators might perceive health-promoting behaviors such as exercising as something aversive rather than enjoyable. The relationship between task aversion and procrastination is well established (Argiropoulou, 2015; Blunt & Pychyl, 1998, 2000; Clark & Hill, 1994; Lay, 1992; Milgram, Marshevsky, & Sadeh, 1994; Milgram, Sroloff, & Rosenbaum, 1988; Steel, 2007), and procrastination is associated with less frequent practice of wellness behaviors (Sirois, 2004a, 2004b, 2007; Sirois et al., 2003). This is also in line with Sirois and Pychyl's (2013) conceptualization of procrastination as a form of self-regulation failure aiming to regulate emotion and repair mood in the short term.

Procrastinators also reported more frequently feeling bad when waking up. This is not surprising given the well-established positive association between procrastination and negative mood states (Beswick et al., 1988; Ferrari & Beck, 1998; Ferrari et al., 1995; Ferrari & Tice, 2000; Martin et al., 1996; Pychyl et al., 2000; Senecal, Koestner, & Vallerand, 1995; Solomon & Rothblum, 1984). For example, it was found that the individuals who were in a negative mood state were more likely to procrastinate, especially if they had to choose between a duty that they had committed themselves to complete and other more attractive alternatives (Tice, Bratslavsky, &

Baumeister, 2001). In addition, procrastinators reported significantly greater difficulty to change their sleeping patterns. This is in line with previous studies suggesting a link between chronic procrastination with stress and poor quality sleep, with perceived stress explaining this association (Sirois, Van Eerde, & Argiropoulou, 2015). Other researchers have also found that chronic procrastinators were more likely to characterize themselves as an evening type, namely a person who is more active during the afternoon or evening hours, rather than during the morning (Carrier & Monk, 2000).

Last but not least, procrastinators reported significantly less life satisfaction both in the present and in general. In fact, the negative correlation between procrastination and university students' mental health is well established (Ferrari, Harriott, & Zimmerman, 1999; Sirois, 2007; Steel, 2007). Some researchers even suggest that much of procrastination's effect on life satisfaction is mediated through anxiety and regret (Caldwell & Mowrer, 1998). Other researchers also point to the fact that procrastinators experience more remorse in several life domains such as their educational aspirations, their parental role, their interactions with family and friends, their financial program, and most importantly, their health (Ferrari, Barnes, & Steel, 2009). Our finding regarding life satisfaction is also consistent with previous research with Greek university students which found that procrastination was negatively associated with psychological well-being, emotional ties, general positive affect, and life satisfaction, while it was positively associated with worse mental health, psychological distress, loss of behavioral and emotional control, depression, and anxiety (Argiropoulou, Siatis, & Kalantzi- Azizi, 2014).

A limitation of our study that should be considered was the exclusive reliance on self-reports. Future research could benefit from the application of different methodologies, such as diary studies, in order to more accurately assess the frequency of both well-being and risky behaviors. In addition, the sample was small and relied exclusively on university students studying at the country's major university, located in the Greek capital (Athens). A replication of the study with a larger more representative sample of students could be potentially enlightening. The small sample size could also be responsible for the low reliabilities that were observed in some of the subscales. Furthermore, the sample principally consisted of very young and healthy individuals. The inclusion of older adults or participants with different health problems could be potentially more enlightening regarding the relations of procrastination and some other variables studied, such as medication or exercise.

Concluding Thoughts

In this chapter, we have argued that university life and emerging adulthood involve important lifestyle changes that can have a negative impact on university students' health. Our research has demonstrated that procrastinators in particular seem to be at a greater risk for adopting negative health behaviors during this period, which may have significant negative consequences for their well-being. This is true for Greek university students, who seem to be very similar to their peers in other parts of the Western world. This unwillingness to adopt more positive health behaviors, despite the fact that they are not satisfied with their lifestyle is also characteristic of the developmental phase of emerging adulthood. This highlights the importance of prevention programs aimed to educate young students regarding the risks of adopting risky health behaviors. These programs should focus not only on increasing students' motivation and self-efficacy to adopt more positive health behaviors but also on decreasing procrastination. Learning to induce more positive mood states when engaging with certain positive health behaviors could also improve the efficacy of current prevention programs. For example, prevention programs could benefit from introducing students to more effective coping skills for dealing with negative emotions, mood, and experiences, rather than adopting health risk behaviors, such as the use of alcohol and other substances.

What we can also learn from Greek students is that cultural factors such as tight familial relationships or local dietary habits could potentially act as protecting factors against the adoption of unhealthy behaviors. Future research could thus benefit from investigating potential context-specific protecting or risk factors in order to increase the efficiency of current prevention programs aiming at healthier living among university students.

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CHAPTER 8

Procrastination, Emotion Regulation, and Well-Being

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The consensus among researchers as reflected in the various contributions to this volume is that procrastination is a form of self-regulation failure. When we procrastinate, we fail to regulate our behavior to act on our intentions and fulfill our plans toward our goal. This is a needless, voluntary delay that we engage in despite the awareness that not doing the task as intended may lead to negative outcomes such as poorer performance or stress associated with last-minute efforts later on. Although there is widespread agreement on the centrality of self-regulation failure in understanding procrastination, the question of why our self-regulation fails generates a larger variety of answers based on a wide variety of theoretical perspectives.

As summarized in two meta-analyses (Steel, 2007; Van Eerde, 2003), research has indicated that this self-regulation failure is correlated with quite a range of different contributing factors such as temporal discounting which is the discounting of larger, later future rewards in favor of smaller, sooner rewards (O'Donoghue & Rabin, 1999); personality traits such as high impulsivity (Ainslie, 1975; Gustavson, Miyake, Hewitt, & Friedman, 2014; Loehlin & Martin, 2014) or low conscientiousness (Lay, 1997; Schouwenburg & Lay, 1995; Watson, 2001) that undermine the ability to protect one intention from competing intentions; as well as various forms of irrational thinking (McCown, Blake, & Keiser, 2012) including perfectionism (Flett, Stainton, Hewitt, Sherry, & Lay, 2012) and fear of failure (Haghbin, McCaffrey, & Pychyl, 2012; Schouwenburg, 1992) that undermine goal engagement. Certainly, each of these factors has been shown to explain some of the variance in measures of procrastination, however in this chapter we argue that the self-regulation failure of procrastination can best be understood as an outcome of emotion regulation.

We conceptualize procrastination as a self-regulation failure that results from the overriding desire to feel good now, or rather to *not* feel bad now

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(Sirois & Pychyl, 2013). Procrastination provides an hedonic shift in the emotions experienced when the decision to delay a task is taken, and as such we argue that any discussion of procrastination needs to begin with an understanding of emotion regulation. In fact, many if not all of the factors related to procrastination outlined earlier may be understood as part of the process of or an outcome related to procrastination as an emotion-regulation strategy. For example, we do not procrastinate because we are impulsive or lack self-discipline, we procrastinate because we are using task avoidance as means to regulate our emotions. Certainly individuals who are more impulsive or who have less self-discipline may give in to this desire for short-term mood repair through procrastination more easily or more frequently, but it is procrastination's function as an emotion-regulation strategy that best explains why we procrastinate.

In this chapter, we explore how procrastination functions as an emotion-regulation strategy that provides short-term mood repair. We begin by explaining the link between emotion regulation and procrastination. In this section, we draw on more general research on self-regulation that demonstrates how regulating moods and feeling states can lead to a failure of self-control. Here we explain how, when faced with aversive tasks, the priority of mood repair results in the task avoidance we label procrastination. Having established the link between emotion regulation and procrastination, we then turn to the rapidly expanding research literature on emotion regulation with a particular emphasis on the conceptual frameworks developed by Gross (2013, 2014) and Koole (2009). We summarize how both process and function perspectives allow us to understand why it is that the present self engages in self-defeating delay at the expense of the future self. Situating procrastination as a form of emotion regulation that provides a short-term hedonic shift helps us to understand the paradoxical conflict between the present self and the future self when we procrastinate. Based on this emotion-regulation perspective, we then discuss avenues for future research with a focus on well-being and health.

"GIVING IN TO FEEL GOOD"—THE PRIORITY OF SHORT-TERM MOOD REPAIR

In their target article published in the journal *Psychological Inquiry*, Dianne Tice and Ellen Bratslavsky (2000) provide a clear explanation of how a focus on regulating moods and feeling states can lead to a failure in self-regulation more generally. This is an important paper in relation to understanding

procrastination because as Tice and Bratslavsky explain "… emotion regulation is a special case of self-regulation in that it can often undermine attempts at others kinds of self control. Specifically, focusing on regulating moods and feeling states can lead to a failure of self-control in other areas such as dieting, time management, impulse control, and so on" (p. 149). Of course, their "and so on" includes specific reference to goal pursuit and the breakdown in goal pursuit because of procrastination. They explain that it takes self-control to work on or persist at a difficult task because this self-control is necessary to inhibit hedonistic impulses to do something else instead. Citing some early research on procrastination (Ferrari, 1991; Solomon & Rothblum, 1984), they note the important fact that working on difficult tasks can make us feel anxious and worried, and we can avoid these negative emotions by avoiding the task, or by procrastinating. Stated most simply, they argue that, "When in a bad mood, people want to feel better, and many ways of feeling better involve indulging appetites – things that one normally uses self-control to resist" (p. 149).

At the heart of their argument is the primacy of short-term mood repair or an hedonic shift, and this shift has most commonly been identified and studied as getting out of bad moods or controlling negative emotions (Tice & Baumeister, 1993). Although emotion-regulation strategies can involve deliberate attempts to upregulate *negative* emotions (e.g., enhancing negative moods prior to an anticipated conflict), our focus in this chapter mirrors the emphasis of Tice and Bratslavsky (2000) on getting out of a bad mood, since it is most relevant to the case of procrastination, and as Tice and Bratslvsky note, "… getting out of a bad mood of some kind is the most common and important form of self control" (p. 150).

The experimental work that supports Tice and Bratslvsky's argument was conducted by Tice, Bratslavsky, and Baumeister (2001). Participants in their studies read emotionally evocative or neutral stories resulting in one of three mood conditions: happy, sad, or neutral. As participants read the stories, they were instructed to focus on the emotions by writing an essay that described what they felt as they imagined themselves as the protagonist in the story. For example, participants in the "sad" condition imagined being a hurried car driver who in his or her haste drives through a red light causing an accident in which a child dies. In contrast, the protagonist in the happy condition saves a child's life. Once the relevant mood was established, Tice and colleagues had their participants move to the second part of the experiment, an intelligence test. However, prior to the test, participants were given time during which they could practice for the test. All participants were told

that practice improves test performance and they were instructed to use at least some of the time for practice, however, they had the choice about how much of this time was spent in practice. Along with the practice test for preparation, the participants were shown alternative activities available such as magazines, puzzles, and games that they were free to use. During the practice period, the researchers unobtrusively observed the participants and measured their time on task practicing as well as time spent on the alternative activities.

Their key finding was that participants in the sad condition spent less time practicing for the test and more time procrastinating than participants in the happy and neutral conditions. Their tentative conclusion at this point was that this time spent reading magazines, playing games, and so on, instead of preparing for the test, was an attempt to repair their mood. Of course, the time spent off task may have simply been due to a lack of motivation, not an effort to repair mood.

In order to demonstrate that time spent procrastinating was actually an effort to repair mood, Baumeister and colleagues adapted a mood-freezing paradigm to manipulate participants' expectations of the efficacy of any attempt at mood repair. In the third of a series of three studies involving different forms of self-control failure, Tice et al. (2001) again manipulated mood (good vs. bad) using the scenarios previously summarized, but added a mood-freezing variable. Participants were told that their moods were either frozen, the effect of aroma-therapy candles in the laboratory, or changeable. Based on their hypothesis that procrastination served an emotion-regulation capacity improving short-term mood, they predicted that those participants in the bad-mood condition who believed their moods were changeable would procrastinate more by engaging in alternative activities as opposed to preparing for what they expected would be a nonverbal intelligence test. In addition, they added a third condition to their experimental design where they manipulated the appeal of the alternative activities. In this case, they offered either relatively boring alternative tasks such as a preschool-level plastic puzzle or relatively entertaining or fun alternatives such as video games or reading magazines. In sum, they expected a three-way interaction of mood, changeability of mood, and appeal of distractors to predict procrastination.

What they found was that most of the participants in most of the conditions spent about half of the 15 min available to them practicing for the upcoming test. Participants were able to self-regulate to do what was asked of them because they were told it was important. However, as expected, participants who

went into the intelligence test portion of the experiment in a bad mood, who believed that their mood was changeable, and who had entertaining alternative tasks available to them spent significantly more time procrastinating.

Although there are certainly limitations to operationalizing procrastination in an experimental design as time spent engaged in task-irrelevant activities [and Tice et al. (2001) concede that it may only reflect a narrower concept of "preparatory effort"], we think that these results are extremely important in terms of our basic understanding of why we procrastinate. Their finding that more procrastination resulted when participants were in a bad mood, believed they could change this mood, and had a mechanism (enjoyable alternatives) to do this reveals that procrastination is an emotion-regulation strategy or an emotion-focused coping strategy in which we use avoidance to create some short-term improvement in mood.

This is a fundamental assertion about the nature of procrastination, and it creates an important distinction from other causal theories related to procrastination. As Tice et al. (2001) argue, if procrastination is simply the result of fear of failure or perfectionism, that their participants felt threatened by the upcoming test thinking that they could not perform up to their expectations, then it should not have mattered whether the alternative tasks were relatively boring or enjoyable. If this were the case, self-handicapping (Ferrari, 1991; Ferrari & Tice, 2000) and self-esteem protection through procrastination (Ferrari, 1994) may have been possible by choosing a boring alternative task, but participants did not do this. Similarly, if it is simply that emotional distress undermines an individual's motivation to do a task, again neither appeal of distractors nor changeability of mood would have made a difference in the results. In fact, Tice et al. (2001) found that bad mood induced procrastination but this was contingent on both the belief in the changeability of mood (something we typically expect in day-to-day life) as well as how enjoyable the alternative tasks were.

What we argue based on these important studies by Tice et al. (2001) is that the priority of short-term mood repair and the emotion-regulation function of procrastination is fundamental for understanding why we procrastinate (Sirois & Pychyl, 2013). We procrastinate because we use avoidance to regulate our emotions, and the priority of this emotion regulation undermines the self-regulation necessary for goal achievement. In other words, when tasks we find aversive evoke negative emotions and thoughts such as frustration, boredom, resentment, or anxiety (Blunt & Pychyl, 2000), we use task avoidance to downregulate these emotions, but in doing this we fail to move forward with our tasks and related goals.

Given this perspective, it is commonly argued that procrastination is a form of underregulation where we fail to exert the self-control necessary to stay on task (e.g., "just use your willpower"), however, procrastination is better understood as a form of misregulation. In other words, people are actually mistaken in their belief that procrastination, or other impulsive activities such as eating, gambling, or spending, will make them feel better. This distinction between under- and misregulation strategies in relation to self-regulation failure has been discussed at length by Baumeister and colleagues (Baumeister & Heatherton, 1996; Baumeister, Heatherton, & Tice, 1994) where they explain that underregulation results from deficient standards of performance, inadequate monitoring of behavior, and/or inadequate strength; whereas misregulation is due to false assumptions or misdirected efforts, particularly with unwarranted emphasis on emotion. This misregulation can take a number of forms, and Baumeister and Heatherton (1996) provide examples of how people try to control the wrong aspect of a process or try to control something that is essentially beyond control (e.g., thought suppression). More importantly, Baumeister and Heatherton explain that

> ***The most common pattern of misregulation involves emphasizing (short-term) affect regulation at the expense of some other, more lasting and substantive aspect. Often a particular problem consists of both practical obstacles or difficulties and subjective, emotional distress, and when people respond by focusing their efforts on emotional regulation they neglect the more fundamental, practical aspects, thereby leaving the problem unsolved or even compounding it. By giving priority to affect regulation, they allow the cause of the problem to get worse and so in the long run they end up worse off.*** **Often they end up feeling worse even though affect regulation was their top priority** ***– (pp. 10–11, emphasis added).***

In other words, when a task evokes emotional distress (and, of course, aversive tasks are those most commonly associated with procrastination), people focus on emotion-focused coping as opposed to planful problem solving; they use avoidance for the short-term hedonic shift that results when they escape the negative, task-related emotions, but they end up worse off for the delay because of the increased stress of time pressure as well as their diminished sense of self that results from the ineffective coping. In turn, this escalating distress may contribute to a further undermining of effective self-control that is necessary for task engagement. What this latter part of the misregulation process captures so well are the anecdotal reports of procrastinators who describe the "downward spiral" of procrastination once begun that are embodied in self-critical and judgmental views of self (Sirois, 2014a) as well as negative self-evaluative thoughts and rumination that further contribute to their stress (Flett et al., 2012).

Evidence for procrastination as a misregulation problem is clear in the studies previously summarized where Tice et al. (2001) found that there were no differences in participants' final mood reports between the frozen mood and changeable conditions. The apparent affect regulation or short-term mood repair was, at best, very short term because participants did not experience a significant long-lasting upregulation of positive affect through playing video games or reading magazines. Tice et al. (2001) cite previous research that support how common these mistaken beliefs related to mood regulation. For example, studies have shown that people believe that snacking on sugar-rich foods would provide lasting energy, but in fact provide only a brief boost (Thayer, 1987, 1996). The parallel with procrastination is clear; although there may be some immediate mood-boosting benefits to video games as an off-task alternative, the experimental evidence shows that they have no longer-lasting effects. Summarizing this perspective on procrastination as a misregulation of emotion, Tice et al. (2001) write, "Thus, people may be correct in anticipating that impulsive indulgences will bring them pleasure and thus relieve a bad mood, but they may be mistaken in expecting that this improvement in mood will outlast the indulgence" (p. 65). Indeed, this summarizes the misregulatory failure of procrastination very well, and helps us understand why the priority of short-term mood repair results in the present self trumping the future self in a most irrational manner. Procrastination as a emotion-regulation strategy *is* adaptive in the short term, however it does not bring about more enduring changes that are associated with successful or adaptive forms of coping (Skinner, Edge, Altman, & Sherwood, 2003). In fact, it undermines the future self with increased stress, time pressure, and an even wider gap between the demands of the task at hand and the available resources to deal with the task (e.g., time and energy).

The takeaway message from the various studies conducted by Baumeister et al. (1994) is that emotion regulation takes precedence over other self-control behaviors and even undermines self-control. Most importantly, from this perspective, procrastination can be best conceptualized as a strategic effort at affect regulation. Again, quoting Tice et al. (2001), "One may still make moral judgments about the abandonment of impulse control under distress, but from a purely pragmatic standpoint, it does appear to have a strategic rationality behind it" (p. 64). Misguided as it might be, our choice to avoid an intended task, to procrastinate, is a strategic decision; although this decision may be at a nonconscious level, which we discuss in more detail later.

This depiction of procrastination as a maladaptive emotion-focused coping strategy used to regulate emotion has recently been substantiated through a meta-analysis of empirical research by Sirois and Kitner (2015). Working from the theoretical perspective of the procrastination-health model (Sirois, 2007; Sirois, Melia-Gordon, & Pychyl, 2003) Sirois and Kitner pulled together the existing research (published and unpublished) to explore how adaptive (e.g., "I take direct action to get around the problem") and maladaptive (e.g., "I drink alcohol or take drugs in order to think about it less") coping responses were associated with procrastination and stress. In their first study, they drew on 15 data samples (N = 4357) to calculate a single index for both adaptive and maladaptive coping based largely on the COPE or Brief COPE scales (Carver, Scheier, & Weintraub, 1989). The adaptive coping index included the four COPE subscales of active, planning, instrumental, and emotional support seeking; and the maladaptive coping index consisted of the combination of the subscales: denial, self-blame, behavioral disengagement, and substance use.

Their results were consistent with the theoretical understanding of procrastination as a maladaptive coping style. The meta-analyses revealed that procrastination was significantly and negatively associated with adaptive coping and positively associated with the index of maladaptive coping. Interestingly, the moderator analyses revealed that procrastination was more strongly associated to maladaptive coping in studies conducted with community samples as compared to student samples.

In order to examine the possible reasons for the associations between procrastination and coping, in their second study, Sirois and Kitner (2015) explored to what extent adaptive and maladaptive coping mediated the relation between procrastination and stress. Their results demonstrated that maladaptive coping played a role in the relation between procrastination and stress, whereas adaptive coping did not. In other words, at least part of the shared variance between procrastination and stress is explained by maladaptive coping, providing even further evidence for the conceptualization of procrastination as being linked to avoidant and disengagement coping, which we have depicted as a form of short-term mood regulation (Sirois & Pychyl, 2013).

In the context of this edited volume, these findings are of particular interest given previous research documenting the harmful effects of maladaptive coping on psychological well-being and health, particularly when adaptive coping is low, as in the case of procrastination (Thompson et al., 2010). As Sirois and Kitner (2015) conclude, "… the combination

of higher levels of maladaptive coping and lower levels of adaptive coping associated with procrastination in the current study indicates that procrastinators' preferred coping repertoire may confer risk for psychological well-being" (pp. 441–442). Although we argue that this is clearly the case, a great deal more longitudinal and experimental work is required to understand the interplay of procrastination and stress temporally in order to better understand the potential consequences for health and well-being. What is safe to conclude is that in terms of coping, procrastination is clearly associated with other maladaptive forms of coping that in turn are related to stress. In fact, it is primarily the use of maladaptive coping strategies that explain the relation between procrastination and stress (and, subsequently, procrastination and well-being).

In another recent study, Sirois (2015) explored the role of procrastination as a vulnerability factor for poor adjustment to and management of hypertension and cardiovascular disease (HT/CVD). Using a community sample of individuals with HT/CVD (N = 182) and healthy controls (N = 564), she demonstrated that higher procrastination scores were predictive of HT/CVD and that procrastination was more strongly associated with maladaptive coping behaviors in participants with HT/CVD than the healthy controls. Specifically, the participants in the HT/CVD group engaged in more behavioral disengagement and self-blame. This underscores not only the basic relation of procrastination with maladaptive coping generally, but also the significant negative health effects associated with procrastination specifically. These results also support the procrastination-health model (Sirois, 2007; Sirois et al., 2003) as a conceptual framework for understanding how procrastination confers greater risk for the development of health problems. This model aptly identifies how maladaptive coping plays a crucial role in understanding procrastination and its effects.

To this point, we have argued that procrastination is best understood as a maladaptive emotion-focused coping strategy wherein we "give in to feel good," avoiding aversive tasks to avoid the negative emotions that accompany them. In addition, we have summarized research that has shown that even when we initially exert self-control to pursue our goals, the exertion of self-control itself commonly evokes negative emotions which may lead to short-term mood repair through task avoidance or procrastination. Understood as a maladaptive emotion-focused coping strategy used to regulate emotion, we also explained how this is an example of the misregulation as opposed to the underregulation of emotions. Yet, as we have argued previously (Sirois & Pychyl, 2013), from a temporal perspective, the

conceptualization of procrastination as a coping strategy involving immediate mood repair is not simply the primacy of mood repair but also the primacy of the needs of the present self over the needs of the future self. In order to better understand the implications of this temporal perspective of emotion-focused coping and procrastination, we turn next to research and theory on emotion regulation.

EMOTION REGULATION

As Gross (2013) succinctly states in his high-level summary of the emotion-regulation literature, "Cultivating emotions that are helpful – and managing emotions that are harmful – is one of the central concerns of the field of emotion regulation" (p. 359). Given this perspective, it is easy to see how the larger context of emotion-regulation research provides an important framework for understanding procrastination. How can we understand task avoidance as part of emotion regulation?

The answer to the question is far from simple, as our ability to upregulate or downregulate the magnitude or duration of our emotional responses includes a wide range of possibilities ranging from explicit, conscious, effortful strategies to implicit, effortless, and automatic processes or habits [see Gross (2014) for a review]. In short, people do lots of different things to regulate their emotions, and as we have argued, procrastination is one of these things. The fact that we engage in this misregulation strategy is not surprising to emotion regulation researchers, as Gross notes "… there are so many paths to emotion regulation failure and misregulation, it's a wonder people ever are able to successfully regulate their emotions at all" (p. 362).

Perhaps most important to this volume is the fact that emotional responses influence our physical health and well-being in a number of ways (DeSteno, Gross, & Kubzansky, 2013). For example, Butler (2011) proposes that there are three ways in which emotion regulation may impact health which depend in part in how emotion regulation is broadly viewed. If emotion regulation is viewed as a component of a more holistic and global self-regulatory system (which includes physiological regulation of heart rate, respiration, etc.) in the service of goal-directed behavior, then failure to self-regulate emotions should also be detectable as adverse changes in physiological response patterns, such as low heart-rate variability and the poor responsiveness of the parasympathetic nervous system which functions to downregulate the stress response. Over time these changes can take a toll on physical health. Similarly, if the emotion system is viewed as an internal

system with fight or flight as its default, then failure to inhibit this response via effective regulation of negative emotions can result in imbalances in the activation of the nervous system that contribute to numerous psychological and physical health issues. Lastly, and perhaps most relevant for our discussion of procrastination, Butler (2011) notes that if altering emotional responses is the target of self-regulatory attempts, health may be impacted if the cognitive and behavioral strategies used to regulate emotions are unhealthy, such as engaging in health-risky behaviors (e.g., alcohol or drug use; unhealthy eating) or cognitive avoidance (e.g., escapist tendencies; see LaVoie & Pychyl, 2001; Sirois, 2014c).

As we noted earlier, the emphasis on short-term mood regulation or misregulation of mood means that the benefits from a boost of positive mood to replace the feelings of dread or anxiety over a pending task are just that, temporary. Once the desired mood-boosting effects of the temporary fix wear off, the negative feelings surrounding the task which prompted the procrastination and avoidance remain. In effect then, these short-term mood regulation strategies set up procrastinators for experiencing a series of ups and downs in their emotional states as their unsuccessful attempts to make more lasting changes in their mood fail. This fluctuation in affective states over time and events has been termed affective variability. Although there is some controversy as to whether affective variability is healthy or unhealthy, a recent population-based study provides some very compelling evidence for the toll that affective variability may take on health. In over 15,000 adults, self-reported fluctuations in both positive and negative mood over the previous day were associated with poor subjective health and a greater number of diagnosed illnesses including angina and depression, even after controlling for mean levels of mood and demographic variables (Chan, Zhang, Fung, & Hagger, 2015). Together, this theory and research indicates that poor emotion regulation, and the variability in affective states that often results, can have clear and often dire consequences for physical and psychological health. This theory and research also underscores the need to consider procrastination from an emotion-regulation perspective.

Given the burgeoning field that emotion regulation has become (Gross, 2014; Koole, 2009), it is beyond the scope of our chapter to summarize even the major trends. Instead, we focus specifically on two important perspectives conceptually. First, we situate procrastination theoretically within Gross's (1998) *process model* of emotion regulation to help further explain why procrastination is best understood as an emotion-regulation issue. Second, we situate procrastination *functionally* and *temporally* as a strategy

to satisfy hedonic needs (Koole, 2009). Taken together, these high-level perspectives serve to explain the phenomenon of procrastination and point to possible avenues for future research that will help us understand how and why procrastination affects our health and well-being.

A fundamental assumption in the emotion-regulation literature is that "… people are motivated by 'hedonic considerations,' or the wish to increase short-term pleasure and decrease short-term pain" (Gross, 2014, p. 9; see also Larsen, 2000; Tamir, 2009). Although there are other reasons or motivations for changing emotions (e.g., instrumental motives to achieve some outcome such as appearing calm), our focus is on the most basic of human motives, increasing short-term pleasure because it is clear that this is the motivation related to procrastination, and it is what ultimately makes it such a self-defeating strategy. Beginning with this most basic motive, we then need to consider what process individuals go through as they manage their emotions to achieve this hedonic goal.

Gross (1998, 2014) has defined a highly abstracted model of this process which he labels the Process Model of Emotion Regulation. The key temporal components of this process are the situation-attention-appraisal-response sequence which, although linear in design, feeds back on itself recursively. For example, the situation may be a dreaded conversation with a colleague or a daunting writing project. Of course, the mere thought of either of these situations draws attention followed by appraisal or the individual's assessment of what the situation means in light of his or her goals. In the previous examples, these appraisals may be summarized as "threat" and the emotional responses generated by this appraisal process result in subsequent changes experientially, behaviorally, and biologically as we become anxious. In the recursive nature of this process model, Gross notes that emotional responses typically change the situation that first gave rise to them.

It is important to note here that many different terms are used to describe the "emotional response" in this model. On the one hand, the threat appraisal may generate a stress response; the situation is perceived to exceed the individual's ability to cope (Lazarus & Folkman, 1984). On the other hand, we might label the emotional response more precisely as anxiety, frustration, or resentment. These distinctions are important, as the terms affect, emotion, stress, and mood are used differently by different researchers causing confusion in the literature. Although a detailed discussion of these distinctions is simply beyond the scope of this chapter, it is important to acknowledge the discrepancies of use and clarify our own usage. For our purposes, it is safe to use stress and emotion interchangeably when

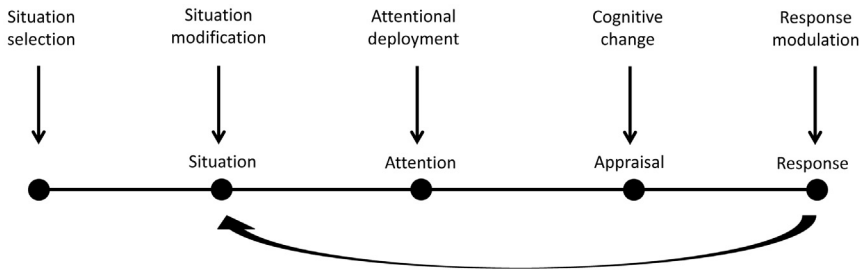

Figure 8.1 ***The process model of emotion regulation (Gross, 1998, 2014).***

discussing procrastination because both refer to negative and often unspecified affective responses. And, although Gross (2014) and others (Parkinson & Totterdell, 1999) distinguish emotions from moods, we follow the definitional approach adopted by Koole (2009) who uses these terms interchangeably, as they each refer to emotionally charged states. We argue this is justified usage because the emotional response to aversive tasks can be diffuse like moods, and they certainly seem to bias cognitions (McCown et al., 2012). Similarly and in contrast to Gross, we do not distinguish between coping and emotion regulation because in the context of our discussion of procrastination, we see both coping and emotion regulation as focused on decreasing negative affect with an emphasis on longer periods of time. What we mean by the latter criterion is that all projects have a temporal dimension (Little, 1983), and procrastination, like coping with bereavement (an example that Gross uses to distinguish coping from emotion regulation), extends over time. In sum, it must suffice to say that at least in terms of our consideration of procrastination, the common terms of affect, emotions, mood, and stress are synonymous.

Returning to the process model in terms of our understanding of procrastination, Gross (2014) overlays five points in this process model where emotion regulation can occur (see Fig. 8.1). Each of these is temporally bound to the emotion-generative process. For example, in relation to the first step, situation, Gross identifies both situation selection and situation modification as potential regulatory processes. These are followed sequentially by: altering *attentional deployment*, *cognitive change* related to the appraisal process, and modulating the emotional response itself (labeled *response modulation*).

This theoretical background sets the stage well for an understanding of how procrastination functions as an emotion-regulatory strategy, and the focus is on the first potential point of regulation, situation selection. Interestingly in this regard, Gross (2014) writes, "The most forward-looking

approach to emotion regulation is *situation selection*. … [one takes] actions that make it more (or less) likely that one will end up in a situation that one expects will give rise to desirable (or undesirable) emotions" (p. 9). In the case of situations that evoke negative emotions as aversive tasks are seen to do with procrastination, downregulating negative emotions to meet our hedonic needs is the goal. So, we take actions that make it less likely that we will be in the situation that gives rise to negative or undesirable emotions. We do this by avoiding the situation or task altogether. We leave the task and select another situation or task. We procrastinate.

Although situational selection is an obvious first emotion-regulation strategy fulfilled by procrastination, it can be accompanied or even reinforced by selective *attentional deployment,* specifically distraction, which Gross (2014) notes is one of the most common forms of attentional deployment. Our research (Little & Pychyl, 2015) has certainly documented that distraction is the first-choice strategy for those feeling the dissonance evoked by procrastination.

By this point in the emotion-regulation process as depicted in Gross's model, the typical procrastinator is done. Avoidance has achieved the goal of the hedonic shift as we documented in the opening section of this chapter. By either selecting a different situation (or task) as well as potentially distracting themselves from the situation or task, people can downregulate negative emotions, effectively resulting in the "giving in to feel good" that was captured in the research by Tice and Bratslavsky (2001). In effect, by using what Gross typified as the "forward-looking approach of situation selection," procrastinators preempt other possible emotion-regulation strategies, at least in the short term.

Interestingly, successful procrastination interventions are actually focused on getting people past their reliance on situation selection and distraction as emotion-regulation strategies, and, instead, these interventions focus on the use of cognitive change to modify how people appraise a situation so as to alter its emotional significance. For example, with cognitive behavioral techniques (Dryden, 2012; Dryden, Neenan, & Yankura, 1999), people are explicitly taught an approach to cognitive change that results in a change in the appraisal of tasks so that there is no longer a primacy of mood regulation that is conducive to situation selection or avoidance as an emotion-regulation strategy. Similarly, successful interventions for procrastination may also rely on the last stage in Gross's model, *response modulation*. For example, in order to alter the response to negative emotions generated by threat appraisals of aversive tasks, people may be

taught acceptance-based strategies (Glick & Orsillo, 2015) or mindfulness-based meditation (Sirois & Tosti, 2012), as the nonjudgmental awareness of emotions allows people to respond differently, and the meditation itself may foster neuroplastic changes in cortico-limbic circuits responsible for stress and emotion regulation, downregulating negative emotions (Taren, Creswell, & Gianaros, 2013).

What is obvious from this temporal reflection on the emotion-regulation strategies that are related to procrastination is that different forms of emotion regulation at different points in the process have different consequences, both in the short and long term. As Gross (2014) explains because "… emotions develop over time, then intervening at different points in the emotion-generative process should lead to different outcomes" (p. 10). In this regard, Webb, Miles, and Sheeran (2012) provide a comprehensive review of the effects of different emotion-regulation strategies, and the results of their meta-analysis revealed the differential effectiveness of different types of strategies at different points in the process. For example, distraction, a strategy used early in Gross's process model, was shown to be an effective way to regulate emotions, as was the reappraisal of *emotional stimuli*. In contrast, the reappraisal of the *emotional response* that results from this process was not effective in regulating emotions. Although there were many important moderators that affected strategy effectiveness, what their study revealed was that Gross's process model of emotion regulation does provide a generative framework for research and furthering our understanding of how people regulate their emotions.

Although Gross (2014) provides a robust and productive conceptual framework of emotion regulation, the recent review and theoretical integration completed by Koole (2009) makes an important contribution, particularly in terms of our discussion of procrastination. One point of departure from Gross's process model of emotion regulation is that Koole rejects the temporal order inherent in this process, arguing that research indicates that these responses are in fact variable. Instead of using a temporal order to organize emotion regulation conceptually, Koole looks at both the *targets* of emotion regulation (i.e., attention, knowledge, and bodily expressions of emotion), as well as the *functions* of emotion regulation (i.e., need-, goal-, or person-oriented functions). Although it would be possible, and certainly of interest, to address the elements of both the targets and functions in detail, we focus primarily on the functions that emotion regulation serves, and specifically on the need- and goal-oriented functions of Koole's conceptualization in order to discuss procrastination.

As noted previously, a basic psychological assumption is that emotion regulation serves hedonic needs. People regulate their emotions to promote pleasure and prevent pain (Gross, 2014; Larsen, 2000). As Koole explains, this basic hedonic priority may be adaptive because negative emotional states are costly to the organism drawing on mental and physical resources (Sapolsky, 2007). More importantly in terms of our understanding of procrastination, Koole notes that hedonic needs may be immediately activated upon encountering emotional stimuli and that this activation is quite reflexive, operating largely at subcognitive levels. Not surprisingly, Koole then draws on the work of Tice et al. (2001), explaining that the need-oriented functions of emotion regulation are directed toward immediate gratification and often have an impulsive quality.

Of course, this hedonic function of emotion regulation is only one of three needs in Koole's typology, and the hedonic function may conflict with both the goal- and person-oriented functions of emotion regulation. For example, the need to achieve a challenging work-related goal in a timely manner to fulfill your responsibilities on a team might require emotion regulation to tolerate negative emotional states associated with the work goal (e.g., anxiety, fear of failure), and this inherently conflicts with hedonic, need-oriented emotion regulation. What is particularly challenging when emotion regulation needs clash is the relative automaticity of hedonic need fulfillment. Because hedonic needs are presumed to be operating at a nonconscious level of information processing (Panksepp, 1998), the result when the emotion-regulation needs clash is the primacy of short-term mood repair as we have explained in the previous section and in previous work (Sirois & Pychyl, 2013).

From the perspective of emotion regulation serving multiple needs, the question then becomes how do people resolve conflicts between these needs as in the previous workplace example. Koole (2009) is left to speculate on this process because there is little research that has explored this dynamic process. Koole reasons that need-oriented functions may be more important when people are experiencing acute emotional distress, whereas the goal-oriented function of emotion regulation may dominate when the situation provides strong norms for appropriate emotional responding (e.g., workplace expectations). In any case, what is obvious from this depiction of the various functions that emotion regulation serves is that conflict between these needs is inherent, and in the case of procrastination, it seems that one of the major tensions arises between the hedonic need for feeling good now versus the goal-oriented need of achieving longer-term goals.

Stated this way, it is quite obvious how Koole's emotion regulation framework helps us understand not only the hedonic-need fulfilling function of procrastination as an emotion-regulation strategy, but also how procrastination can undermine our goal pursuit when the hedonic needs conflict with goal-oriented needs.

The extant emotion-regulation literature provides ample evidence to support Koole's classification of emotion-regulation strategies by their targets and functions. For example, one of the most robust findings related to need-oriented regulation is the research on the individual differences in repressive coping style where repressors as compared to nonrepressors use avoidant attentional strategies to decrease exposure to negative stimuli (e.g., unpleasant scenes, negative feedback about self). As cited in Koole (2009), this hedonic-need focused repressive coping has been shown to be related to heightened susceptibility to infectious disease (Jamner, Schwartz, & Leigh, 1988), inhibited immune function (Barger, Bachen, Marsland, & Manuck, 2000), and increased risk for cancer, asthma, and coronary heart disease (Weinberger, 1990). These health risks mirror work by Sirois (Sirois et al., 2003; Sirois, 2007) who has also demonstrated links between procrastination and negative health outcomes, most recently hypertension and cardiovascular disease (Sirois, 2015). What these studies underscore is the adverse effects of emotion-regulation strategies that target attention through avoidance and fulfill a need orientation as opposed to a goal orientation.

On a similar vein, Koole summarizes research that shows how emotion-regulation strategies that target knowledge through psychological defense mechanisms to fulfill a need-oriented function undermine psychological adjustment and are related to poor health outcomes (Myers et al., 2008). He concludes by noting that people recruit a wide variety of interpretative biases defensively to ward off anxiety and other types of negative emotions. In the procrastination research literature, this is certainly evident as well. Procrastinators use self-presentation strategies to justify and excuse delays (Ferrari & Díaz-Morales, 2007), are less willing to seek out negative self-relevant information (Ferrari, 1991), and engage in more downward counterfactual thinking (Sirois, 2004) in order to regulate emotions. Together these strategies, among others, affirm positive views of the self and thereby downregulate negative emotions.

Of course, no discussion of the need-oriented function of emotion regulation would be complete without some consideration of how bodily activities, the third of Koole's targets, play a role in short-term emotion regulation. As Koole explains in his review of the research literature, bodily

activities that provide immediate gratification are an important target for need-oriented regulation, and as we have reviewed previously, these bodily activities are often part of our "give in to feel good" response (Tice & Bratslavsky, 2000). In this regard, "comfort foods" and stress-induced eating are common examples. People are not eating because they are hungry; they are eating to manage emotions, to create a hedonic shift in emotions. Similarly, we argue that procrastinators are not putting a task off due to poor time-management abilities or as the result of practical reason (i.e., this is not a purposeful delay), rather they are seeking a hedonic shift of emotions through avoidance. Specific to the focus on bodily targets as defined by Koole, research demonstrates that procrastinators consume more alcohol than nonprocrastinators (Sirois, Voth, & Pychyl, 2009), indicating the use of a bodily emotion strategy that may provide immediate hedonic benefits.

In sum, from Koole's perspective on the need-oriented function of emotion regulation, people may achieve a hedonic shift in emotion through: (1) attentional strategies such as avoiding threat (task avoidance) or distracting themselves from aversive tasks (engaging in social media instead of the task at hand); (2) interpretative biases using a large repertoire of defense mechanisms to justify needless delay while maintaining a positive self-image; and (3) indulging in physical/bodily strategies such as substance use to reduce anxiety or cultivate positive moods. As Koole concludes, in each case, the end result of these need-oriented strategies of emotion regulation is the primacy of immediate emotional relief at the expense of long-term goal pursuit and well-being.

It is important to underscore that any emotion-regulation strategy may make things better or make things worse depending on our perspective. From a short-term perspective in the case of procrastination, we have to admit that avoidance can effectively remove the situation that is causing negative emotions, particularly those that are common to aversive tasks such as frustration, boredom, and resentment (Blunt & Pychyl, 2000). There is nothing like leaving that challenging writing task to tomorrow to eliminate the frustration and turmoil one might be feeling when staring at the blank page. However, the most common emotion correlated with procrastination is guilt, and this is true for both state (Pychyl, Lee, Thibodeau, & Blunt, 2000) and trait (Pychyl & Little, 1998; Rozental, 2014) procrastination. In this sense, procrastination is far from ideal as it downregulates *some* negative emotions while stimulating or causing others.

A short-term perspective does reveal other apparent benefits of procrastination. For example, research by Tice and Baumeister (1997) has shown

that in the short term, procrastinators do show higher levels of well-being and health than nonprocrastinators. In their study of students, the first semester revealed the procrastinators to be happier and healthier than the nonprocrastinators, however this pattern reversed in the next semester.

From a long-term perspective, situational selection via procrastination is truly self-defeating, a maladaptive emotion-regulation strategy because the task remains aversive in terms of its characteristics, and in addition, time pressure (if not time urgency) creates additional negative emotions and/or stress. We would also argue that one's sense of self is affected negatively, as the individual recognizes the costs and irrationality of the original delay, and typically engages in self-blame (Sirois, 2015; Voth & Sirois, 2009) or experiences negative emotions such as shame (Fee & Tangney, 2000). As Baumeister and Heatherton (1996) conclude so aptly, "By giving priority to affect regulation, they [procrastinators] allow the cause of the problem to get worse and so in the long run they end up worse off. *Often they end up feeling worse even though affect regulation was their top priority*" (pp. 10–11, emphasis added).

CONCLUSIONS AND FUTURE DIRECTIONS

Reflecting on the study of emotion regulation, Gross concludes that "… the study of emotion regulation has generated many more questions than answers" (2014, p. 12). Indeed, framing procrastination from an emotion-regulation perspective, while absolutely essential in terms of understanding why we procrastinate, raises important new questions about how we understand procrastination, particularly as it unfolds over time. For example, some people may avoid what is perceived to be a highly aversive task (thereby downregulating task-related negative emotions) and then choose to do an enjoyable alternative activity (upregulating positive emotions). In contrast, others may procrastinate on one task only to take on another task with similar but slightly less negative appraisals. In this case, these individuals regulate emotions by first downregulating negative emotions associated with the procrastinated task, and then by upregulating positive emotions through task completion on the substitute task. As John Perry (2012) has summarized this approach in his notion of *structured procrastination*, these structured "procrastinators" still get a lot of things done. Importantly, we know that progress on our goals, particularly goals we appraise as self-congruent, fuels our well-being (Sheldon & Houser-Marko, 2001), so the structured procrastination which at first blush appears to be a maladaptive strategy for

emotion regulation is transformed into a positive outcome as people make progress on their other goals. Of course, from day to day, which task is avoided and which is completed changes in a dynamic fashion. All of this is to say that there is much yet to understand about the process of procrastination as an emotion-regulation strategy as it plays out temporally in our lives in the context of not one but multiple competing goals.

Gross (2014) suggests a number of specific issues that research in the area needs to address with an emphasis on understanding individual differences in emotional awareness, what influences the relative importance of hedonic versus instrumental motives, and finally which type of strategy is chosen to achieve this goal. Although we do have some preliminary evidence that emotional awareness (operationalized as "emotional intelligence") is negatively correlated with self-reported procrastination (Heward & Pychyl, 2011) and that the nonjudgmental awareness of emotions characterized by mindfulness is also correlated negatively with procrastination (Sirois & Tosti, 2012), there is still much more to be done to understand the dynamic interplay between successful long-term goal pursuit, the relevant goal-oriented emotion-regulation strategies used, and our hedonic desires of the present moment. In this regard, Gross's second question about what influences the relative importance of hedonic versus instrumental motives is perhaps most important in any consideration of procrastination as an emotion-regulation strategy. To the extent that long-term benefits outweigh immediate ones, we should expect people to regulate their emotions toward long-term goals (Tamir, 2009), yet it seems with chronic procrastination in particular, this is not the case. In fact, it is the problem. Procrastinators may continue to seek immediate mood repair over emotion regulation that fosters more useful emotions instrumental to their goal pursuits.

Certainly this emphasis on short-term pleasure has been a dominant theme in the emotion-regulation research literature, and, throughout this chapter, we have argued that people procrastinate in order to achieve a hedonic motive where we "give in to feel good." Feeling good is not, however, the only motive. As Tamir (2009) argues, there is also the desire to maximize utility, defined as long-term pleasure, and this instrumental perspective on emotion regulation would mean that what people want to feel at any particular time (i.e., what motivates them in terms of emotion regulation) depends both on pleasure and utility. Walter Mischel's classic work on delay of gratification (Mischel, Shoda, & Rodriguez, 1989) is a clear example of this instrumental perspective, where at least some children in his studies would forgo the immediate reward to maximize utility.

Similarly, Tamir argues, although studying now is unpleasant, students may choose to do so to maximize the longer-term reward of academic success. Or, for example, although exercising now may be perceived as aversive, people may choose to do so to maximize the longer-term health benefits. Summarizing research related to this instrumental perspective, Tamir concludes that "… there is evidence that people differ in what they want to feel in certain contexts and that such differences are linked to the goals they pursue" (p. 103).

Tamir and colleagues (Tamir & Ford, 2009; Tamir, Mitchell, & Gross, 2008) have tested this instrumental perspective in a variety of experiments in which participants chose an emotion-inducing experience based on the nature of an expected follow-up activity. For example, when expecting a confrontation in a follow-up interaction, participants chose anger-inducing activities even though they expected them to be unpleasant because these emotions better prepared them for the task ahead. This underscores Tamir's main point that people prefer emotions that they expect to be useful.

Although it is certainly apparent that people can and do use their emotions instrumentally to support their goal pursuit and to maximize longer-term utility, in terms of understanding procrastination, the key point to recall is that procrastination is a misregulation problem. The problem is that procrastination becomes the strategy of choice when people mistakenly believe that they can achieve their desired emotional state through avoidance rather than goal pursuit. In addition, as Tamir notes, people are not always aware of their wants or expectancies. Summarizing research findings on the link between implicit (nonconscious) expectancies of emotional utility and emotional preferences, Tamir concluded that "These findings are important, because if people are unaware of what determines their emotional preferences, they might have difficulty changing them" (p. 104). The key thing here in terms of procrastination then is that procrastination is not so much about the perceived utility of the long-term goal and preference reversal as proposed by a utility account of procrastination (Steel, 2007). People recognize the utility of their future goals, however they have mistaken beliefs about the utility of short-term mood repair. These mistaken beliefs about emotional utility support the misregulation of emotion which makes a hedonic emotion shift the priority. In fact, Tamir acknowledges that dysfunctional emotion regulation may result from people wanting the "wrong" emotions, which in turn may be due to an inaccurate expectancy of emotional utility. She adds that such knowledge may be acquired through learning. In effect, we might conclude that in the case of the

misregulation of emotion that characterizes procrastination, people have learned the wrong thing.

This misregulation of emotion may also be a result of the rift between the present self and the future self. Our research (Blouin-Hudon & Pychyl, 2015; Sirois & Pychyl, 2013; Sirois, Shucard, & Hirsch, 2014) has shown that a lack of future-time perspective (Sirois, 2014b), less present-self, future-self continuity, as well as a lack of cognitive empathy for the future self is related to more frequent self-reported procrastination. In effect, when people are unable to take the future self's perspective into account, they overemphasize the emotional utility of short-term mood repair (Sirois & Pychyl, 2013; Tice & Bratslavsky, 2000). Again, it may not be an issue of the perceived lower utility of the longer-term goal, but rather the perceived higher utility of the hedonic emotion-regulation strategy in the short term. As Sirois explains in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective of this volume, this is a peculiar issue of temporal myopia. In this case, an outcome of the myopic perspective is the misregulation of emotions with a preference for short-term mood repair.

As we move forward with our research, particularly in our exploration of the discrepancy between present and future self, we have a particular emphasis on understanding how these cognitive representations of self over time influence our emotion-regulation strategies. Although we agree with Tamir who, from an instrumental perspective, argues that there are benefits in the promotion of knowledge about the utility of emotions, we think it is necessary to embed this within the context of an understanding of the temporal self. Only when we understand our goals and self across time can we effectively use our emotions to achieve our goals and maximize our health and well-being.

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CHAPTER 9

Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination

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INTRODUCTION

As we started to write this chapter Clarry Lay, well-known researcher on procrastination and self-proclaimed procrastinator, published a book titled *Procrastinators (and Others) Can Still Get to Heaven: A Guide to Directed Everyday Living* (Lay, 2015). In addition to being a masterwork for procrastination self-help, the title is a statement to how we, at least in North America, view procrastinators. Perhaps characterizing procrastinators as demonized individuals who may not reach heaven is harsh, but there is some truth to the idea behind his title: most of us would agree that procrastination is a "bad thing" that we should not normally do and that we *should* feel like a "bad person" for doing it.

For the most part, procrastination has been investigated from a personality perspective, conceptualized often as a disposition that some people have toward procrastinating, chronic procrastinators (Lay, 1986; Sirois, Melia-Gordon, & Pychyl, 2003; Ferrari, Johnson, & McCown, 1995). The goal of this chapter is to examine procrastination from a situational perspective, as opposed to a person perspective, and reflecting an instance when we fail to regulate our behavior in order to pursue a desired socially valued goal. Specifically, this chapter examines a key situational determinant of behavior, the norms we perceive in our social environment, and how they may impact our thoughts, emotions, and behavior in the context of procrastination. We offer a norm-based approach to procrastination focusing on experiences of shame and guilt, and provide some preliminary evidence illustrating the potential value of this approach, and discuss the implications of this approach for well-being and health. Complementing personality perspectives, our approach reveals that the causes of procrastination may lie in the normally

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occurring and functional influence of the social norms that individuals derive from their social environment. It further suggests that the robustness of procrastination habits to individual-level intervention may occur because social normative pressures counteract the effect of these interventions as soon as the person resumes their normal activities.

PROCRASTINATION AS SELF-REGULATION FAILURE

Humans have a unique ability to control their inner states, thoughts, and emotions in the pursuit of a valued goal within a given time frame. This ability to self-regulate allows people to meet goals that fulfill expectations shaped by social norms, which they have acquired through the socialization process. For example, Dave might start early September planning with his kids for their Halloween costumes. That would allow him time to visit stores, such as used-clothing stores and costume stores, early, before other parents, and select items that would be best suited for his kids' costumes. By the time Halloween comes along Dave would go trick-or-treating with his kids. His ability to fulfill normative expectations would transform into positive social cues, such as smiles and praises from the neighbors toward him and his kids as they trick-or-treat. With these praises Dave and his kids would experience positive social emotions, such as pride.

In an idealized world of self-regulation, never would we delay our commitments to valued tasks in order to do things that are easier or more fun. Unfortunately, in reality, most, if not all of us, will on some occasions fail at self-regulating our inner states, thoughts, and emotions, and delay the pursuit of an intended goal. Social norms provide a crucial source of information that help to signal such failures of self-regulation. They help people assess what is normally expected for any given goal pursued, both in terms of requirements for the goal (e.g., what it should look like) and expected timeline (e.g., how long should this take). When we fail to meet these requirements and/or timelines, we transgress social norms. For example, Dave might put off planning for his kids' Halloween costumes until October 31st in the morning. By the time he gets an idea together, without the input of his kids, he heads to the stores to find them out of the more well-suited items for original costumes. Not having a plan ahead of time further delays him in getting his kids ready to go trick-or-treating, and once they are ready, the costumes are rather poorly put together. His failure to self-regulate to fulfill normative expectations will lead to negative social cues, such as frowns, a lack of praise by the neighbors, and an awkward experience for his kids

who can perceive some disappointment in the faces of the neighbors as they open the door and see them in costumes that were put together at the last minute. Due to these social cues, Dave and his kids will not experience a rise in positive emotions commonly associated with trick-or-treating. Instead, they will most likely experience an aversive emotional state caused by the transgression of social norms, characterized by social emotions such shame and guilt, which have important implications for well-being, especially when experienced repeatedly (Tangney & Dearing, 2002). For example, proneness to experience shame is linked to depression and increased problematic coping behaviors, such as alcohol consumption.

At the root of these instances of self-regulation failures is a focus on regulating immediate affect; seeking pleasure now, typically at a later cost (see Sirois & Pychyl, 2013; Tice & Bratslavsky, 2000). Dave may be avoiding the effort needed to get his children to participate in planning their costumes at the end of a long hard day at work by doing a host of activities that are easier or more fun, from watching hockey on TV to spending time playing with his kids by building a pillow fort. As with other forms of self-regulation failures, a key component of procrastination then is an in-the-moment failure to focus on the long-term benefits, and instead letting short-term needs guide behavior (Sirois & Pychyl, 2013). From this perspective, procrastination can be conceptualized as instances of *procrastinatory behavior*. This approach to procrastination is well suited to a social psychological perspective, which places emphasis on situational determinants of behaviors. Moreover, this approach may complement the more dominant personality-focused approach to understanding procrastination. Instead of asking "why is Dave a procrastinator?" the focus is on how sociocultural forces are shaping procrastinatory behavior and its cognitive, emotional, and behavioral outcomes. A situational perspective also makes it easier to think about sequences of situations, how one instance of procrastinatory behavior may motivate or demotivate future instances of procrastination and thus affect health and well-being.

PROCRASTINATORY BEHAVIOR FROM A NORMS PERSPECTIVE

Social norms are cognitive representations of what relevant others, often called a reference group, would typically think, feel, or do in a given situation, which people use as reference points to guide and assess their own thoughts, feelings, and behavior (Turner, 1991). Once acquired through

social learning, the norms can be retrieved from memory automatically and influence our actions whether or not others are present (Aarts, Dijksterhuis, & Custers, 2003; Aarts & Dijksterhuis, 2003; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008). By using the term "automatic," we mean that this process may occur without conscious intent and awareness; we do not mean that the influence of norms is uncontrollable or demands no attention (see Bargh, 1994; Jacobson, Mortensen, & Cialdini, 2011). Thus, social norms motivate the self-regulation of both private and public actions by informing individuals of what is likely to be either adaptive or problematic behavior in a given situation.

For the most part the influence of norms operates through social comparison (Cialdini, Kallgren, & Reno, 1991; Prentice, 2000). Instead of relying on an in-depth analysis to determine the goals that are best suited to our current circumstances, as well as the best-suited course of action and the optimal time to pursue them, we can simply turn to social norms, look at what we think others do or should do in similar situations and do the same thing. People go along with (observed or verbally communicated) normative ways of behaving because, in part, they rely on other people's behavior as a source of information to help them define social reality and act in an adaptive way (Cialdini & Trost, 1998; Turner, 1991).

Social norms will typically evolve in order to facilitate the interaction of individuals with others in social groups (Cialdini & Trost, 1998; Turner, 1991). Our ability to adhere to normative expectations is key to fulfilling our fundamental need to belong (Baumeister & Leary, 1995). Social affiliation and exclusion are assumed to play a central role in the motivational component of normative influence (Cialdini & Trost, 1998; Turner 1991). They can be associated with the actual presence of others, such as being congratulated by or receiving disparaging comments from another person. Social norms can also be associated with the imagined or implied presence of others, such as recalling being congratulated by or receiving disparaging comments from another person (Cialdini & Trost, 1998; Turner, 1991). Social norms can thus have a motivational impact on the actions of individuals through the actual, imagined, or implied presence of others. As other socially learned contingencies, these expectations can dynamically change as a function of situational demands and repeated experiences (Giguère, Vaswani, & Newby-Clark, 2015; Vaswani, Newby-Clark, & Giguère, 2015; see Prentice, 2000).

A dominant assumption, which can be traced to early social influence research (cf, Deutsch & Gerard, 1955), is that people learn that adherence

to norms will lead to social affiliation and positive social emotions (e.g., pride), while transgression of norms will lead to social exclusion and negative social emotions (e.g., shame) (see Cialdini & Trost, 1998; Leary, 2000; Rossano, 2012). Thus, social emotions play an integral role in the comparative process by which social norms influence our behavior and well-being.

By directing the self-regulation process, norms are a primary contributor to the well-being of these groups and the people comprising them (Heine, 2012; Turner, 1991). For example, although instant gratification may have been an adaptive strategy at certain points in human evolution (e.g., when much uncertainty resided as to when food would be next available), the emergence of social networks and collaborative efforts toward the satisfaction of primary needs make the principle of reciprocity a more functional option. Collaboration among individuals in this regard is essential to the well-being of all. *In a well-functioning group, self-regulation failures will typically transgress social norms, because if they were normative, that is, if the majority of individuals did such behaviors most of the time, the vitality of groups would be jeopardized*. Self-regulation failures are therefore often a challenge to a well-functioning group. They have, by definition, long-term costs for the person and his or her community. For example, procrastination may prevent one from fulfilling the demands of the norm of reciprocity, a norm which would benefit the group as a whole by facilitating interactions among individuals and fostering support.

When engaging in procrastinatory behavior, people avoid pursuing an intended goal and instead engage in behaviors that are easier and/or more pleasurable. In most situations, this course of action will lead them to transgress one or more expectations set by social norms. These failures may affect the requirements of the goal they intended to pursue (e.g., poor Halloween costumes) and/or the timeliness of the goal completion (e.g., starting to trick-or-treat late). *As such, procrastinatory behavior is a form of self-regulation failure that leads to the transgression of social norms.* Thus, procrastinatory behavior should typically be met by cues of social devaluation and rejection that are actually communicated by others following a transgression or automatically activated from learned social contingencies (Giguère et al., 2015; Vaswani et al., 2015).

When people are repeatedly unable to fulfill normative expectations, others around them will devalue them as a person. This devaluation is certainly one commonly ascribed to procrastinators, who because of their procrastination habit, cannot be trusted to fulfill the commitments tied to normative expectations. People use the normative behavior of others to give them

information as to who they are as a person. Procrastinatory behavior communicates a variety of less than flattering personal attributes that are commonly associated with procrastinators: that the person has low self-control, poor time-management skills, lack of consideration for others, is lazy, and that he or she struggles to delay gratification and is likely to pursue impulses as they arise. Indeed, past work that observed that procrastination is associated with low self-control (Ferrari & Emmons, 1995; Sirois, 2004). Procrastination may hamper the ability of individuals to fulfill their obligations and commitments made to others, making them less valuable from a cooperation perspective as a valuable person to affiliate with (van Eerde, 2003).

Procrastinatory behaviors give rise to the type of norm transgressions that signal that the procrastinator is a "bad person" to associate with because they will struggle to consistently fulfill his or her commitments and obligations to others, such as fulfilling the obligations of reciprocity. Indeed, procrastination is frequently depicted as an irrational act of putting things off for "no good reason," particularly by people who do not think of themselves as procrastinators (Burka & Yuen, 1983; Ferrari et al., 1995). The habit of procrastinating is viewed as self-defeating by lowering the quality of performance because one ends up with less time to work (Baumeister & Scher, 1988; Ellis & Knaus, 1977). Others view procrastination as a self-destructive strategy, akin to self-handicapping such as when people withhold effort so as to give themselves an excuse for any future poor performance (Jones & Berglas, 1978; Fee & Tangney, 2000). People will often refer to the unnecessary stress that procrastinators expose themselves to by repeatedly completing tasks at the last minute, and more generally to the burdens on procrastinators' physical or mental health (Boice, 1996; Flett, Blankstein, & Martin, 1995; Sirois, 2007, 2014). In general, people who regularly procrastinate are often viewed as being lazy and sloth (Schouwenburg & Lay, 1995). Ascribing a sin deemed so problematic that is a "deadly sin" to people who frequently engage in procrastinatory behavior clearly denotes the level of social devaluation tied to procrastinatory behavior. It is no surprise that historically procrastination has had a negative moral connotation; it implies not living up to societal expectations (Ferrari et al., 1995; Sabini & Silver, 1982).

"FEELING BAD" ABOUT PROCRASTINATING

The way in which people assess whether their behavior is problematic or not is inextricably shaped by the norms they derive from the social groups to which they belong (Giguère, Lalonde, & Taylor, 2014; see Turner, 1991).

When their actions lead to the transgression of social norms, people will typically "feel bad" (Leary, 2000). They experience different types of negative emotions when they transgress norms. Among these, social emotions hold important and distinct implications in terms of their motivational impact on self-regulation (Giguère et al., 2014; see Leary, 2000; Tangney & Dearing, 2002).

Social emotions have their genesis in social norms, which are acquired through the interaction of individuals with their social groups (Turner, 1991). These emotions occur as a result of real, anticipated, remembered, or imagined encounters with other people in response to events that have implications for how one is perceived by others, particularly one's viability as a social participant in relation to other people (Leary, 2000). When people adhere to norms, they will typically experience cues of acceptance and affiliation, which leads to positive social emotional experiences, such as feeling proud. When people transgress social norms, they will typically experience cues of being devalued and of rejection, which leads to negative social emotional experiences, such as shame.

Two of these negative social emotions, shame and guilt, hold important and distinct implications in terms of their motivational impact on self-regulation (Giguère et al., 2014; Fee & Tangney, 2000; see Tangney & Dearing, 2002). A key distinguishing feature of guilt and shame revolves around a difference in cognitive appraisal of the perceived causes of transgressions. When people perceive that the key cause of a transgression lies in the specifics of one of their behaviors (i.e., the cause is a "bad behavior"), rather than to some external cause, they are more likely to experience feelings of guilt. Feelings of guilt typically motivate the reparation of the transgression and, more generally, facilitate self-regulation (Giguère et al., 2014; see Baumeister, Stillwell, & Heatherton, 1994; Cialdini & Goldstein, 2004; Tangney & Dearing, 2002). When the perceived cause of a transgression extends beyond the specifics of the behavior to the self as defective, unworthy, or abnormal and people attribute the cause to a stable negative characteristics (i.e., the reason is that they are a "bad person"), they are more likely to experience shame. We experience shame when we think our way of being somehow deviated from what we think that people should normally be in a given situation. Shame is often associated with a motivational tendency to withdraw, which in turn is associated with negative outcomes in terms of health and well-being (e.g., increased alcohol consumption; Dearing, Stuewig, & Tangney, 2005; Giguère et al., 2014).

If procrastination is a form of norm transgressing self-regulation failure, then it should be associated with experiences of guilt and shame. Indeed, past research has examined and observed a relationship among shame, guilt, and procrastination (Blunt & Pychyl, 2005; Fee & Tangney, 2000). The relationship of procrastination to shame and guilt holds important implications for procrastination and its impact on health and well-being. When resulting in feelings of guilt, procrastination should, in theory, motivate the person to repair any issues created by the unnecessary delay of a task, and it should motivate self-regulation overall and thus decrease future procrastination. When shame is experienced, however, the outcomes in terms of procrastination may be less positive. Past work suggests that shame will motivate social withdrawal and overall hamper the person's self-regulation, resulting in negative health and well-being outcomes.

Guilt and Procrastination

The notion that feelings of guilt are associated with procrastination is a long-standing one. Many theoretical approaches to procrastination frequently make reference to procrastination-related guilt (Blunt & Pychyl, 2005; Burka & Yuen, 1983; Ferrari, 1991b; Ferrari & Beck, 1998; Lavoie & Pychyl, 2001). Pychyl, Lee, Thibodeau and Blunt (2000) used an experience sampling approach to examine, among other aspects of emotion and motivation, the link between instances of procrastinatory behavior and guilt. Their results revealed that when people indicated they were procrastinating, they were more likely to also report experiencing guilt.

The link between the act of procrastinating and feelings of guilt is commonly framed as a transgression of norms. For example, Panek (2014) observed that procrastination through unscheduled media use was associated with increased feelings of guilt. Exploring the issue of situational procrastination more in depth, Reinecke, Hartmann, and Eden (2014) observed that procrastination through media use (e.g., online gaming) brought about by self-regulation failure led to a significant increase in reported situational guilt. In sum, guilt appears to be tied to procrastinatory behavior, and this relationship is explained, at least in part, by norm transgression.

Shame and Procrastination

Although from a procrastination perspective the relationship between guilt and procrastination is a long-standing one (Burka & Yuen, 1983; Ferrari, 1991b; Ferrari & Beck, 1998; Lavoie & Pychyl, 2001), from a social emotional perspective, however, shame may play a more significant role in

procrastination. Even though people may have experiences of guilt over specific acts of situational procrastination (e.g., feelings of regret and remorse over not having finished a particular project at work), the motives underlying the act of procrastination and the propensity to chronically procrastinate may be more closely linked to feelings of shame.

Shame results from the perception that the cause of the transgression is rooted in a negative stable aspect of the person. It results from the actual, imagined, or anticipation of cues of social rejection. The type of transgression created by procrastination is one amenable to attribute the cause of the transgression to a character flaw, to be viewed as a "bad person," and to be met with cues of social rejection.

At the core of the influence of social norms is the principle of reciprocity (Cialdini & Goldstein, 2004). From a social exchange perspective, a procrastinator will struggle to fulfill obligations set by the principle of reciprocity. Thus, the type of norm transgression brought on by procrastinatory behavior may readily lead to the perception that the transgressor cannot be trusted to fulfill his or her commitments to others, including being unable to reciprocate normative expectations. This type of transgression signals to others that the person is unable to fully participate in the exchange process involved in the maintenance of the norms of a group. These transgressions should thus result in concerns about being negatively evaluated by others, such as actual, imagined, and anticipated cues of social rejection. As we rely on normative expectations to predict others' behavior, people who procrastinate make it challenging to predict their behavior across multiple domains and in multiple areas of their lives (e.g., work, family). It would thus be functional that procrastinatory behavior gives rise to shame, which would signal to the person that others might view them as a "bad person"; specifically as someone who should not be trusted to fulfill his or her commitment on time, and thus as someone who may not fulfill the obligations of reciprocity. From this perspective, people are more likely to experience shame following instances of procrastinatory behavior compared to guilt. Supporting this conclusion, Fee and Tangney (2000) observed that proneness to experience shame was associated with procrastination tendencies, while guilt proneness was not.

When people experience shame, they will often socially withdraw, including disengaging from social norms, creating a situation in which the signaling of norm transgression simply may lead people to dismiss the normative message (Tangney & Dearing, 2002). Moreover, in such situations, people may struggle to cope with the experience of shame. If they

frequently experience these situations, they may turn to problematic behaviors to escape from the experience of shame. For example, if Dave experienced shame following the Halloween mishap, he might start to avoid his neighbors and withdraw from his community. Moreover, shame increases the likelihood he seeks problematic coping behaviors, such alcohol consumption that can lower self-awareness (Dearing et al., 2005).

The coping engendered by feelings of shame may very well contribute to a dynamic relationship between shame and procrastination, such that instances of procrastination lead to the experience of shame and shame, in turn, motivates procrastination as a way to cope with the anticipation of being rejected. Indeed, numerous studies link procrastination to social evaluative concerns. Procrastination often represents a defense mechanism motivated by efforts to avoid and self-protect when people fear the possibility of negative evaluation of others (Fee & Tangney, 2000). Supporting this view, Ferrari (1991a) observed that procrastinators were more likely to avoid a task when their performance could be known publicly. Ferrari and Beck (1998) similarly noted that procrastinators were more likely to use fraudulent excuses to try to cover up their unnecessary delay of tasks, and then feel guilty about doing so. In addition, Ferrari (1991b) reported a link between procrastination and social anxiety, suggesting concerns over others evaluations and a desire for approval.

Fee and Tangney (2000) further observed that shame proneness moderated the relationship between procrastination and socially prescribed perfectionism, which can be defined as the perception that *others impose* unrealistic expectations of perfection *on the self* (Hewitt & Flett, 1991). The role of shame in procrastination thus appears to be tied to the social perception of procrastination. In sum, people often procrastinate because they fear the possible negative evaluation of others about who they are, and procrastinating often leads to a type of norm transgression whose perceived cause is a character flaw of the person. Such a dynamic relationship is supported by work observing that chronic procrastination is associated with a proneness to experience shame, while it is not related to a proneness to experience guilt (Fee & Tangney, 2000).

A NORM-BASED APPROACH TO PROCRASTINATION AND EMOTIONS

The social norms we derive from our social environment motivates both private and public actions by informing individuals of what is likely to be adaptive or problematic behavior in a given situation (Cialdini

et al., 1991; Cialdini & Trost, 1998). Social emotions provide instrumental feedback as to whether our actions align or not with social norms. More importantly, when our actions depart from social norms, two types of social emotions signal distinctive feedback and motivational tendencies (e.g., Giguère et al., 2014). Guilt results from the perception that a specific behavior caused us to transgress social norms, while shame is experienced when we perceived that a stable self-ascribed negative trait is at the root of our transgression of norms.

The direct motivational impact of emotions on behavior has received much attention. A classic example of this type of influence is fear motivating flight at the sight of a bear. In the case of guilt, it has been associated with approach motivation to attempt to mend the "bad behavior." For example, Dave could apologize to his kids and read their favorite storybook with them before going to bed. Shame, on the other hand, has been associated with withdrawal motivation generated by the perception that others see the person as a "bad person." For example, Dave could let his partner get the kids ready for bed, and hide in the basement to watch football on the TV.

Emotions can also have an indirect influence on motivation by their impact on cognitions (Forgas, 2000). Negative emotional responses can motivate a reflective process that results in motivational change (Baumeister, Vohs, DeWall, & Zhang, 2007). Through this process, the experience of social emotions can have important motivational impact. For example, when people feel guilty, they will often take steps to amend the transgression that generated their guilt and often create intentions to avoid that such transgression reoccurs. Continuing with our previous example of Dave, he could amend his guilt by taking steps to "make it up" to his kids, such as by planning ahead a trip to an amusement park. If Dave was primarily experiencing shame, he might withdraw from other activities with his kids and in the neighborhood.

To recap our current approach to procrastination, it is assumed to be a type of self-regulation failure which results in the transgression of sociocultural norms. The type of transgression created is one likely to be attributed to something bad about the person and to lead to the experience of shame. Together the attribution process and resulting shame make salient evaluation concerns, specifically concerns that the person will be socially devaluated, and motivates social withdrawal. In the next section, we report some preliminary work that attempts to examine the motivational impact of negative social-emotional experiences in the context of procrastination.

Exploring a Norm-Based Approach to Procrastination and Social Emotions

To date, there has been little research examining procrastination specifically from the lens of social norms. To address this gap, the aim of this study was to explore the perception of instances of procrastinatory behavior as norm transgressing and that this perception is associated to the experience of shame and guilt, as well as some of the sociocognitive motivational outcomes of these emotions. The key signal that the person is a "bad person" is that they are delaying an effortful task for an easier one. Thus, we expected that as the effort demands of a delayed task increased and as the effort demands of an alternate task (pursued instead of the delayed one) decreased, individuals should experience an increased perception that they are transgressing social norms, increased feelings of shame, and increased concerns that they are negatively evaluated as a person.

Method

A sample of 126 undergraduate students was recruited to participate in this study (61% women, mean age 21). After providing consent, participants completed a short survey with demographic information and trait procrastination. Next, participants were asked to recall the most recent time they postponed or delayed a task (or set of tasks) related to their courses and to describe this event in an open-ended format. This open-ended question was followed by a second, asking participants to describe any task(s) they did instead of the task (or set of tasks) related to their courses. Finally, a third question focused on the possible cause(s) for the delay.

Following the open-ended question, participants completed different measures tied to the main relevant constructs, among which they completed items developed to assess the degree of norm transgression and their emotional experience. Finally, participants were debriefed and provided with their compensation (either in the form of course credit or $10).

Task effort. Four items were used to assess the level of effort required to complete the delayed task (or grouping of related tasks) and the alternate task (or grouping of related tasks) (e.g., "The tasks(s) required effort to complete"; "The task(s) required attention to complete"; delayed task $\alpha = 0.89$; alternate task $\alpha = 0.83$). The ratings were done on a 10-point scale (1 *not at all* to 10 *very much*). The items were averaged to create a measure of required effort for the delayed task(s) and for the alternate task(s), with greater values indicating more effort demand.

Norm transgression. A 10-item measure developed to assess the extent to which a behavior transgresses perceived social norms (Giguère & Lalonde, 2015) was adapted for the current study to assess the extent to which people perceived their procrastination transgressed social norms (e.g., "In that situation, I spent more time on other activities than I should have instead of doing the task I was supposed to do"; "Spending my time the way I did was compatible with what is normally viewed as the appropriate work or study habits in that type of situation"). Participants rated their agreement with each item on a 7-point scale (1 *strongly disagree* to 7 *strongly agree*). The items were averaged to create a single measure of norm transgression conflict ($\alpha = 0.80$). Greater values are indicative of greater transgression.

Social emotions. Guilt and shame were assessed using items adapted from the state self-conscious emotion scale (Marschall, Sanftner, & Tangney, 1994; shame, 5 items, $\alpha = 0.87$; e.g., "I felt small"; guilt, 5 items, $\alpha = 0.89$, e.g., "I felt remorse, regret"). Participants rated their agreement with each item on a 9-point scale (1 "*I did not feel this way at all*" to 9 "*I felt this way very strongly*"). The items were averaged to create single measures of shame and guilt. Greater values are indicative of greater reported shame and guilt.

Fear of negative evaluation. The Brief Fear of Negative Evaluation Scale (Brief FNE; Leary, 1983) was included to assess the extent to which people experienced evaluation concerns (12 items; e.g., "I worry about what kind of impression I make on people"; $\alpha = 0.81$). The instructions were adapted to inquire about the concerns people had about being evaluated because of the event they had just described.

Results

Norm transgression. A linear regression examined the effect of effort demands of the delayed and alternate task on the perception of norm transgression to examine the notion that delaying an effortful task for something easier is perceived as norm transgressing. Norm transgression was regressed on the main effects of effort of the delayed and alternate tasks, and their interaction. The regression revealed a main effect of effort of the delayed task, $\beta = 0.48$, $p < 0.001$, and main effect of effort of the alternate task, $\beta = -0.28$, $p < 0.001$. These main effects were qualified by a two-way interaction of effort demand for the delayed and alternate task, $\beta = -0.33$, $p < 0.001$. The two-way interaction was examined by level of the effort demand of the delayed task (lower = −1SD; higher = +1SD) using simple slope analyses (Aiken & West, 1991). At higher levels of effort of the delayed task, the perception of norm transgression decreased as the effort demands

of the alternate task increased, $\beta = -0.39$, $p < 0.001$, while the perception of norm transgression did not vary as a function of the level of effort demand of the alternate task at lower effort demand of the delayed task, $\beta = -0.04$, $p > 0.10$.

Shame and guilt. A mixed-linear model (generated using the lme4 R package; Bates, Maechler, & Bolker, 2011) was used to examine the influence of effort of the delayed and alternate task on the experience of guilt and shame. Type of emotions was treated as a within-subject variable, and effort of the delayed and alternate tasks were treated as continuous between-subject variables.

The model (effort of delayed task × effort of alternate task × emotion type) revealed significant main effects for the effort of the delayed task, $F(1, 121) = 26.35$, $p < 0.001$, and for effort of the alternate task, $F(1, 121) = 14.36$, $p < 0.001$, along with a nonsignificant main effect of type of emotions, $F(1, 121) = 2.92$, $p = 0.180$. These main effects were qualified by a two-way interaction between effort of delayed task and effort of alternate task, $F(1, 121) = 10.43$, $p < 0.001$, a nonsignificant interaction of delayed task effort and type of emotions, $F(1, 121) = 1.84$, $p = 0.355$, and a significant interaction of alternate task effort and types of emotions, $F(1, 121) = 7.03$, $p = 0.018$. All these effects were qualified by a significant three-way interaction between effort of delayed task, effort of alternate task, and type of emotion, $F(1, 121) = 8.02$, $p = 0.011$.

The three-way interaction was examined by type of emotions using simple slope analyses (Aiken & West, 1991). Analyses for shame were done controlling for guilt, while analyses focusing on guilt were done controlling for shame. Effort of delayed and alternate tasks were fixed at +1 SD for higher effort demand and −1 SD for lower effort demand. As depicted in Fig. 9.1, controlling for guilt, at higher effort demand of the delayed task as the effort demands of the alternate task increased the experience of shame decreased, $\beta = -0.39$, $p < 0.001$. By contrast, at lower effort demand of the delayed task the effort demands of the alternate task did not influence the experience of shame, $\beta = -0.11$, $p = 0.567$, which was overall low. As depicted in Fig. 9.2, controlling for shame, the effort demands of the alternate tasks did not influence the experience of guilt at both lower and higher demands of the delayed task, respectively $\beta = -0.19$, $\beta = -0.14$, $p > 0.10$. Overall, the experience of guilt was greater for delayed tasks that required a higher level of effort compared to those requiring lower levels of effort.

Fear of negative evaluation. As with norm transgression, a linear regression was conducted to examine the effect of effort demands of the delayed

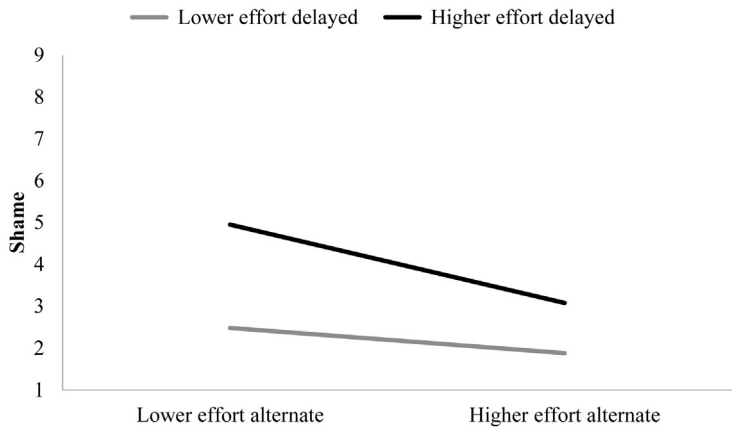

Figure 9.1 ***Shame as function of level of effort demands of the delayed task and the alternate task.***

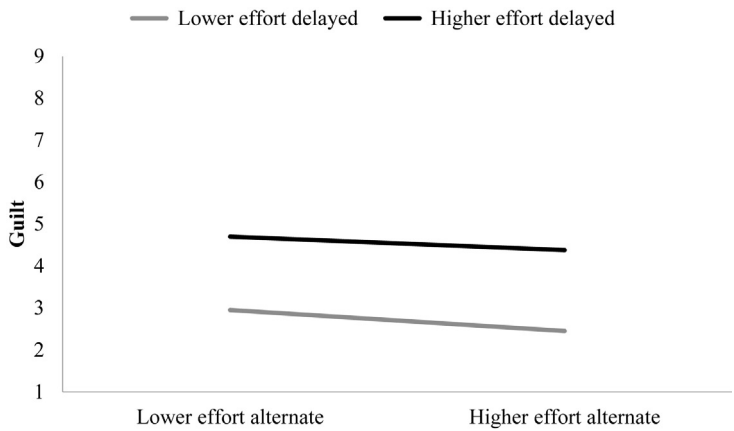

Figure 9.2 ***Guilt as function of level of effort demands of the delayed task and the alternate task.***

and alternate task on the fear of being negatively evaluated because of the delay. The regression revealed a nonsignificant main effect of effort of the delayed task, $\beta = 0.18$, $p > 0.10$, and main effect of effort of the alternate task, $\beta = -0.22$, $p < 0.05$. These main effects were qualified by a two-way interaction of effort demand for the delayed and alternate task, $\beta = -0.42$, $p < 0.001$. The two-way interaction was examined by level of the effort demand of the delayed task (lower = −1SD; higher = +1SD) using simple slope analyses (Aiken & West, 1991). At higher levels of effort of the delayed task concerns to be negatively evaluated decreased as the effort demands of

the alternate task increased, $\beta = -0.51, p < 0.001$, while concerns of negative evaluation did not vary as a function of the level of effort demand of the alternate task at lower effort demand of the delayed task, $\beta = 0.06, p > 0.10$.

What Can We Learn From a Norm-Based Approach to Procrastination?

This study provides a preliminary view of procrastinatory behavior from a social norms perspective by examining the sociocognitive and emotional responses to delaying a task. In support of the notion that delaying effortful tasks by doing tasks that are easier is often perceived as norm transgressing, participants reported the greatest experience of norm transgression at higher effort demands of the delayed task and lower effort demands of the alternate task. More importantly, the results suggest that the type of norm transgression created by such discrepancy between the effort demands of a delayed task and those of an alternate task is conducive to experiencing shame and to become concerned about being negatively evaluated by others.

These results are further supported by previous work from Fee and Tangney (2000), who observed that increased proneness to experience shame was associated with a greater likelihood of procrastinating. Fee and Tangney further argued that procrastination may be used by people experiencing shame as a way of coping with the negative experience of shame. For example, self-handicapping by delaying a task may help buffer potential negative evaluations of others that the task was poorly done (Ferrari, 1991c). Thus, a rather problematic dynamic process may lead people who procrastinate to experience shame, which then increases their likelihood to procrastinate, and so on. Such a dynamic process also concords with a long-standing view of procrastination as a challenging habit to address (Ferrari et al., 1995). If the joint experiences of procrastination and shame are rooted in learned social normative responses, as proposed by the current approach, it would further make sense that procrastination is challenging to address, particularly at an individual-by-individual level.

MANAGING BAD FEELINGS FROM PROCRASTINATION

Our sociocultural perspective on procrastination suggests that managing negative feelings stemming from procrastinatory behavior may be integral for avoiding a negative loop between procrastination and shame, which could lead to multiple negative consequences for individuals in terms of

their well-being and health. As previously discussed, Fee and Tangney (2000) placed an emphasis on managing social evaluation concerns as central to experience of procrastination, particularly in the context of social emotions such as shame. Our current proposed approach, as well as the data previously presented, are in accord with Fee and Tangney's conclusion. The next sections aim to present some of the more dysfunctional and functional strategies that may be used to manage social emotions associated with procrastination.

Managing Poorly

Fee and Tangney (2000) focus on the notion of self-protection, specifically they focus on the concept of *self-handicapping* afforded by procrastination as a strategy to avoid having to face further negative evaluations of others. By delaying a task, people may attempt to forgo any potential negative evaluation of others, that is, "[…] people engage in frequent, habitual, or chronic patterns of procrastination that are self-defeating in the long run, in order to avoid experiences of shame and humiliation in the short run" (p. 171). Self-handicapping is a self-protective mechanism. In essence, people "self-handicap" by creating situation-based obstacles to high performance (e.g., inadequate preparation, lack of sleep, alcohol use) in order to preserve the perception of high ability in the face of failure (Jones & Berglas, 1978). Intentionally or not, people often self-handicap as a means of creating an external cause for their poor performance. Chronic procrastination is one common form of self-handicapping, in that the procrastinator can blame poor performance on "not having enough time" to do the task as well as they could have, under more favorable circumstances. This strategy allows attributions for failure to remain external to the self, thus serving a self-protective function (Ferrari, 1991c).

The withdrawal motivational tendencies associated with shame are well known (Tangney & Dearing, 2002). In the context of procrastination, such a motivational tendency may manifest itself through attempts to *hide or mask procrastinatory behaviors*. This strategy is quite distinct from the self-handicapping one, in which the delay has to be acknowledged and often shared publicly to justify the poor performance on a task. In this case, the goal is to keep private the fact that the person delayed a task. For example, Dave could "cut corners" and use duck tape to fix a part of a costume to one of his child's arm, or neck instead of using appropriately designed glue. The end result may be to hide some of the delays in getting the costumes organized, however there may be later consequences to this delay, for example,

if the duck tape leaves an abrasion mark on his kid's body. The costs of this strategy may affect most the well-being of the person, particularly giving rise to stress and social anxiety that one's shameful act will become known to others. The impact may also be observable in terms of the completion of the delayed task, for which withdrawal can be rather counterproductive. By socially withdrawing, people may be less likely to rely on the social support of others in completing the task they delayed, which may further prevent them from completing the task they already delayed.

From the current sociocultural perspective, an interesting novel view in terms of managing negative emotions associated with procrastinatory behavior may be to *normalize* it. At the forefront, people may change their normative reference point to now perceive that many people engage in delay of effortful task. This view is consistent with research demonstrating that procrastination is associated with low self-compassion and that increases in self-compassion may reduce procrastination (Sirois, 2014). Self-compassion includes a normative, common humanity component which involves acknowledging that one's shortcomings and failures are not unique and are shared by others (Neff, 2003). However, a change in the normative reference point could also be associated with biased cognitive processes, such as the confirmatory bias, which could lead procrastinators to pay increased attention to instances during which others close to them also engage in procrastination.

The end result of this strategy may be rather problematic by altering the perceived norms about task completion and work habits. As discussed previously, people rely on social norms to assess whether their behavior is problematic or not. Repeated attempts to normalize one's delay of intended tasks may lead people to perceive less restrictive norms about task completion and work habits. These altered norms may change how people assess their own behavior, experiencing less and less negative emotional responses to delays. From one perspective, this may be beneficial to the extent that excessive negative emotions surrounding procrastination may contribute to greater stress and further task disengagement as a means of coping with these feelings (Sirois, 2014; Sirois & Pychyl, 2013; Sirois & Kitner, 2015). However, if we consider the motivational value of negative feelings for changing behavior, then these altered norms may reduce delay-related emotional responses below the threshold for which they are functional. Such a dysfunctional response may contribute to further increase procrastination habits in the long term. In addition, these changes in normative perceptions can come with changes in cognitions regarding

procrastination habits. For example, procrastinators can point out that if one puts in the same amount of work on the project, it does not matter whether this is done early or late; or they might argue that procrastination improves their performance because the pressure that comes with imminent deadline increases their performance: "I do my best work under pressure" (Ferrari et al., 1995; Lay, 1995).

Managing Better

The notion that sociocultural norms may play an important role in procrastination suggests that broader societal changes may be required to affect the prevalence of procrastination. As is the case with other prevalent problematic behaviors, the causal factors that are shared among individuals within a social environment may need to change to create sustainable changes in the behavior of many individuals.

Although procrastination is prevalent in societies with a fast pace of life (van Eerde, 2003), not everyone is a chronic procrastinator. Thus, although collective interventions may be effective for sustainable changes, it may be possible that individual-level approaches can complement broader normative changes. It may be possible to manage procrastination and any resulting negative social emotions in a way to avoid becoming a chronic procrastinator or to alter chronic procrastination habits. Our primary focus in this chapter was to examine emotional experiences related to the motivation to procrastinate. An important question remains: are some emotional experiences helping people out of procrastination?

From a norms perspective, adhering to norms contributes to the experience of being a valued person. At an emotional level, pride and respect are two emotions which signal to individuals that they are valued. Overall, particularly in a North American context, people experience a predominance of positive social emotions (Heine, 2012; Leary, Tambor, Terdal, & Downs, 1995; Leary, 2000; Leary & Baumeister, 2000). When people transgress norms, in addition to experiencing negative social emotions, they also experience a decrease in the typical levels of positive social emotions they experience (e.g., Giguère, Sirois & Lalonde, 2013; Giguère et al., 2015; Vaswani et al., 2015). When people experience such a decrease in positive social emotions, they may become motivated to seek out actions to restore that emotional state. For example, Dave might come home after the evening of trick-or-treating and say to his wife "I'm not proud of myself, I should have started to get their costumes organized earlier." This loss of pride may motivate Dave to start to make plans to restore it. For example, he could

plan ahead for the next Halloween, work with his kids to plan creative costumes and even to plan a set of decorations for their house to give it a "scary feeling."

Given our need to belong is a fundamental human motivation (Baumeister & Leary, 1995), people actively try to socially advance by making connections with others in order to fulfill that need. When people detect negative social cues indicating they are no longer socially advancing, they begin to make efforts to realize gains in this regard (e.g., Molden, Lucas, Gardner, Dean, & Knowles, 2009). After detecting negative social cues indicating a threat to social advancement, people may think about actions that they did not do, which, had they done, might have resulted in different social responses from others (Molden et al., 2009). Procrastination is precisely about not having done certain actions to achieve an intended valued goal. The negative social cues resulting from transgressing normative expectations tied to goal pursuit (e.g., what the result should look like; how long it normally takes to get something done) may cause people to reflect on those things that they did not do, which resulted in their not completing the intended goal. In situations of procrastination, where people have recently experienced a drop in positive social cues and pride, they may engage in restorative future behavior, seeking out positive social cues and affiliation in an attempt to restore their pride (Giguère et al., 2013). In this state of eagerness to advance social connections, people will likely try to increase future instances of receiving positive social cues by adhering to social norms, such as completing a goal within an acceptable period of time, and be rewarded with positive social cues, affiliation, and feelings of pride. A focus on increasing affiliation and pride through future behavior rather than engaging in self-blame for the poor outcome of procrastinatory behavior (Sirois & Kitner, 2015) would help to stop the cycle of instances of procrastination leading to the experience of shame, and, in turn, motivating procrastination. From this view, pride in getting things done may be an emotional out to counteract the negative effect of procrastination and shame.

CONCLUSIONS

The primary goal of this chapter was to offer a sociocultural perspective on procrastinatory behavior. From this perspective, procrastination constitutes a failure to engage in self-regulation that leads to the transgression of social norms. Since procrastination signals potential problems with the person's ability to engage in self-control and regulate their impulses, it is a type of

transgression likely to lead to the perception that the person is a "bad person"; a person who cannot be trusted to fulfill his or her obligations and commitment to others, such as reciprocating a favor, and thus not ideal to associate with. This type of transgression increases the likelihood the person will experience feelings of shame, as well as its related cognitive and behavioral impact on health and well-being.

This perspective offers a novel understanding of procrastination suggesting that social factors tied to normative influence may play an important role in shaping procrastination and procrastination habits. It also suggests that a possible avenue to break the cycle of procrastination may be to intervene at a societal or group level to change norms about work habits and task completion. At an individual level, possible avenues of intervention may focus on changing how individuals negotiate the dynamic influence processes of the norms they perceive in their social environment, such as by focusing on positive emotions, particularly those linked to perceptions of being a valued person, of self-compassion, and by providing an overall sense of self-efficacy.

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CHAPTER 10

Temporal Views of Procrastination, Health, and Well-Being

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You have been staring at your computer screen for the past 10 minutes, fingers on the keyboard, cursor flashing in a constant rhythm, ready to greet the words and ideas sitting on the edge of your mind. You had intended on starting this project a few weeks ago, but this task feels unpleasant and challenging, and every time that you think about it or attempt to start it, you end up doing something else instead. Today is no exception. As your attention starts to shift away from your computer, you begin to think about the new art café down the street. You come to the conclusion that tomorrow you will feel like starting this project, that your future self will handle it. For today, however, sipping on a delicious cappuccino while admiring local art seems like a much better plan.

As illustrated in this scenario, procrastination is a self-defeating behavior that makes little sense in terms of adaptive, long-term, and rational decision-making. In fact, people who procrastinate primarily do so because they perceive a task to be aversive, unpleasant, or simply boring (van Eerde, 2003; Steel, 2007). Under this conceptualization, procrastination represents the pull away from an intended task as an attempt to "feel good *now*" (Jackson, Fritch, Nagasaka, & Pope, 2003; Sirois & Pychyl, 2013; Tice & Bratslavsky, 2000; Tice, Bratslavsky, & Baumeister, 2001).

Interestingly, research has highlighted that people who procrastinate not only place more importance on present emotional states (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being; Pychyl, Lee, Thibodeau, & Blunt, 2000), but also generally fail to project themselves into the future (Sirois, 2014a). People who procrastinate neglect long-term goals in favor of short-term satisfaction by focusing on the present and limiting their view of the future. These individuals also tend to perceive their future *self* as they

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do a stranger (Sirois & Pychyl, 2013; Blouin-Hudon & Pychyl, 2015) and often ignore possible consequences for their future self's mental and physical health (see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective; Flett, Blankstein, & Martin, 1995; Sirois, Melia-Gordon, & Pychyl, 2003; Tice & Baumeister, 1997).

It is ultimately this lack of temporal awareness of one's goals, health, and well-being that makes this central aspect of procrastination so self-defeating. If the self will suffer later, why do people still procrastinate? The goal of this chapter is to shed light on this issue. We begin with a brief review of procrastination and temporal self-regulation. Next, we shift to our main focus: temporal aspects of *self*. More specifically, we consider why and how feeling disconnected from the future self relates to procrastination, health, and well-being. Finally, we explore how cognitive and affective processes such as mental imagery and positive affect influence one's connection or *continuity* of self through time, and, ultimately, how these positively relate to our health and well-being.

TEMPORAL SELF-REGULATION

A popular belief stemming from the self-help and certain areas of the scholarly literatures is that procrastination can be overcome by improving time management skills. However, it is clear from our conceptualization of procrastination that improper task prioritization is not at the root of such self-defeating behavior. Indeed, if a person has been delaying a task that he or she finds unpleasant or boring, scheduling it this week or the next is unlikely to increase the likelihood that this task will be completed. As such, viewing procrastination as a specific instance of self-regulation failure within a larger class of self-regulatory problems may be more appropriate (Sirois & Pychyl, 2013).

Self-regulation is a faculty of executive functions—which are seated in the frontal lobes of the brain—and represents the capacity to overcome short-term temptations in order to achieve long-term outcomes (Bauer & Baumeister, 2011). The process of self-regulation involves three components: self-monitoring, standards, and strength (Baumeister & Heatherton, 1996; Carver & Scheier, 1982; Tice & Bratslavsky, 2000). Indeed, the cybernetic or feedback loop model of self-regulation (Carver & Scheier, 1982) suggests that self-monitoring is used to determine if the standards—or abstract notions of how things should be—set by a person are being met. As such, self-monitoring can be used to make necessary adjustments in

order to align one's behavior with preset standards. For example, forming a self-regulatory goal such as sticking to a diet implies setting a particular standard of behavior (i.e., choosing to eat healthy foods, resisting unhealthy foods). For self-regulation to take place, a person needs to monitor thoughts, emotions, and behavior to stay in line with the goal of eating well (Tice & Bratslavsky, 2000).

Furthermore, the strength model of self-control suggests that self-regulation is a limited resource, which when depleted can lead individuals to neglect self-regulatory goals (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister, Vohs, & Tice, 2007). In fact, keeping behavior consistent with standards requires exerting effort to control and override impulses that may conflict with these self-regulatory goals (Baumeister et al., 2007). Coming back to our previous example, resisting tempting but less healthy foods, therefore, requires more self-regulatory resources (Sirois & Hirsch, 2015). If a person has to resist these unhealthy foods for an extended period of time, self-regulatory resources can deplete and result in self-regulation failure, such as breaking one's diet (Baumeister & Heatherton, 1996; Baumeister et al., 2007).

Under this view, regulating negative emotional states associated with an unpleasant, challenging, or boring task and/or self-regulatory goal necessitates stronger cognitive control and effort (Metcalfe & Mischel, 1999). As such, individuals who are not able to adaptively cope with these negative states are less likely to self-regulate. This is often the case with procrastination; negative emotions are likely to deplete individuals, who in turn, are more likely to omit future goals in order to engage in "short-term mood repair" when faced with such aversive tasks (Tice & Bratslavsky, 2000; Tice et al., 2001; Sirois & Pychyl, 2013).

Just as with procrastination, self-regulation and temporality seem to go hand in hand. The links among temporality, mood and procrastination become even clearer if we consider the very real consequences of negative states for cognitive focus, and in turn, temporal orientation. According to the stress orientation hypothesis (Sirois, 2014a), the experience of acute stress initiates a cascade of neurophysiological events that result in attentional, emotional, and behavioral changes to adaptively redirect resources to respond to a perceived threat. A key player in this response is the amygdala, a part of the brain responsible for emotional responding. The amygdala increases moment to moment vigilance toward threatening stimuli and facilitates redirection of cognitive and emotional resources to deal with the threat (Davis & Whalen, 2001). This stress response essentially orients focus toward

immediate concerns and threats to initiate coping efforts (LeDoux, 2000). With respect to temporal focus, the downstream effects of this hard-wired response to stressful stimuli involves less focus on future-oriented concerns and a prioritization of the immediate (Sirois, 2014a).

For the procrastinator, feelings of stress and anxiety about a pending task are therefore likely to translate into ways of removing this immediate "threat" by avoiding the task or engaging in more pleasurable activities, rather than focusing on the long-term implications of delaying this task. When procrastination becomes a habitual or characteristic way of behaving, and hence trait-like in nature, both stress and anxiety may become chronic, shifting the temporal focus to one that is less future-oriented, and more present-oriented (Sirois, 2014a). It is from this perspective that procrastination can be viewed as a form of temporal self-regulation failure (Sirois & Pychyl, 2013).

The story with procrastination does not seem to stop at temporal self-regulation, however. When people "give in to feel good now," they not only fail to mentally time-travel to future events, but they also disregard future self's well-being (Sirois & Pychyl, 2013). In fact, future self's states (i.e., increased stress, aversion to the delayed task, guilt) do not seem to be part of present self's conscious awareness—as if that self was not a self at all but more like another person, like a stranger.

PROCRASTINATION: TEMPORAL SELF AS OTHER

As we have seen, people who procrastinate rarely project themselves to the future (Sirois, 2014a) and feel less connected to their future self (Blouin-Hudon & Pychyl, 2015; Sirois, Shucard, & Hirsch, 2014). The question then remains: why do people who procrastinate experience such present-future self-discrepancies? Our investigation can be guided by the idea that people do not naturally feel similar to a self that extends too far into the past or future. Since people experience multiple selves throughout their lives, how connected one feels to these selves may depend upon the time that has passed between each self (Parfit, 1971, 1987). However, people who procrastinate seem to feel more disconnected than the average person to future selves that are fairly close in time, such as tomorrow's, next week's, or next month's self (Sirois et al., 2014). This suggests that connecting with any future self may be difficult for procrastinators, no matter the temporal horizon of that self.

Two potential and related views on why this may be hinge on research noting that procrastination is related to negative self-evaluations, as well as a tendency toward cognitive escape. Several studies have demonstrated that procrastination as a behavior and a more enduring tendency is associated with negative self-evaluations in general (Flett, Stainton, Hewitt, Sherry, & Lay, 2012; McCown, Blake, & Keiser, 2012), self-blame (Sirois & Kitner, 2015), low self-esteem (Effert & Ferrari, 1989; Ferrari, 2000), low levels of self-compassion (Sirois, 2014b), and a tendency to be unkind and harshly self-critical toward oneself in instances of failure (Neff, 2003). This and other evidence indicating that procrastination is linked to negative automatic and ruminative thoughts about past procrastination (Flett et al., 2012; Stainton, Lay, & Flett, 2000) suggests that these types of negative evaluations may engender future self-discontinuity insomuch that self-derogating thoughts foster disconnection from the self and all its temporal extensions, including the future self.

The seeds of disconnection from the future self may be further cultivated by procrastinators' tendency to engage in unrealistic and wishful thinking about their capabilities in the future. Rationalizing that it is acceptable to put off necessary tasks, because the future self will somehow be more capable, less tired, and in a better mood than the present self, can provide a temporary sense of relief that nonetheless creates more distance to the future self. Building up the future self to superhero status may be a kind of wishful thinking that is born out of low present self-regard, and reflects a tendency to dissociate from the self and become absorbed in pleasurable alternatives to unpleasant realities (Sirois, 2014c). This wishful thinking comes at a cost though by creating an even greater sense of discrepancy and psychological distance to this mythical future self. Because we tend to associate discrepancy and psychological difference with temporal distance (Peetz & Wilson, 2008), viewing the future self this way will contribute to feeling even more disconnected to various future selves, regardless of the temporal horizon with which they are associated.

The irregular self-discontinuities experienced by procrastinators may also be explained in part by present self-biases. In fact, research has found that certain people exhibit present self-biases that can make it difficult to perceive their future self as an extension of who they are today (Pronin & Ross, 2006; Wakslak, Nussbaum, Liberman, & Trope, 2008). In a study by Pronin and Ross (2006), participants were given a list of opposing adjectives such as "serious–carefree," "cooperative–competitive," and

"introverted–extraverted," and asked to circle the adjective that more accurately represented themselves today, themselves in 5 years, a friend today, and a friend from 5 years ago. Participants also had the option to circle "variable/depends on the situation" for traits that did not always feel stable across situations. Results indicated that participants ascribed stable personality traits to their future self and past friend, while they perceived their present self as more flexible across circumstances. This demonstrates that some people may be naturally inclined to perceive their future self as someone that does not behave like them, and who in turn will react to challenges and unpleasant situations differently than they do.

Neuroscience research parallels these findings by illustrating that for some people, certain areas of the brain activate differently for their future self than for their present self. In a study by Ersner-Hershfield, Wimmer, and Knutson (2009a), participants low on future self-continuity showed similar neural activations when they thought about their future self as when they imagined a stranger. Specifically, the cortical midline structures of the brain responsible for self-evaluation, communicating socioemotional significance, and weighing information according to motivational importance were activated when low future self-continuity participants thought about themselves, but not when they thought of others or of their own future self (Ersner-Hershfield, Wimmer, & Knutson, 2009a; Northoff & Bermpohl, 2004).

Interestingly, an important entity of the cortical midline structure, the anterior cingulate cortex (ACC), is connected to brain structures related to cognition, emotion, and reward processing (Ongur, An, & Price, 1998; Vogt & Pandya, 1987). One role of the ACC is to detect discrepancies between a habitual response tendency and a competing goal—such as resisting present temptations or unpleasant emotions to favor long-term gains—and signal the need for increased cognitive control regarding these competing states (Botvinick, Braver, Barch, Carter, & Cohen, 2001; McClure, Botvinick, Yeung, Greene, & Cohen, 2007).

The fact that the ACC is not activated when thinking of the future self for people experiencing low future self-continuity indicates that competing emotional and goal states experienced in the present may not be perceived as relevant for the future self. In other words, people might nonconsciously suppose that the future self will adaptively cope with aversive tasks; that a similar situation will not once again provoke negative emotions culminating in short-term mood repair and inevitably perpetuate the cycle of procrastination.

Self-Discontinuity: Consequences for Health and Well-Being

Overall, the findings we have reviewed on procrastination and future self-continuity indicate that self-continuity can be fragmented when people feel disconnected with the "self" and its associated thoughts and emotions, regardless of the temporal frame. In terms of health and well-being, the toll of this disconnection can be widespread and concerning.

With regards to interpersonal processes, emotional distance can indicate a lack of empathy for others and an inability to make decisions on their behalf. In fact, empathy requires the ability to feel another person's emotions in an attempt to share subjective experience (Hodges & Klein, 2001). Since emotions communicate the motivational value and costs of particular behaviors (Berridge, 2007; Aarts, Custers, & Holland, 2007), the inability to perceive and empathize with future self's emotional states could explain why some people make impulsive decisions while disregarding negative long-term consequences (Eisenberg & Miller, 1987).

Indeed, ethical decision-making relies heavily on weighing the long-term moral and physical consequences associated with particular actions (Jones, 1991). However, individuals who are low on self-continuity are more likely to make unethical decisions such as lying, bribing, and cheating (Hershfield, Cohen, & Thompson, 2011). These short-term decisions are a good example of lack of empathy for the future self as they increase the risk for debilitating consequences such as job loss, imprisonment, and loss of income (Cohen, 2010). Although procrastination is unlikely to result in imprisonment, a lack of connection to the future self can nonetheless have important debilitating consequences.

For example, indulging in tasty, fatty, and not so healthy foods may bring immediate pleasure to the present self, but over time and if done repeatedly, this consumption has a very real cost to the future self who may become overweight, obese, or worse (see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective). Similarly, spending hours on end playing video games or watching television entertains the present self, but does little to contribute to the heart health of the future self who needs regular physical activity to stay fit. Given the temporal self-discontinuity associated with procrastination, it is not surprising that these less than healthy behaviors are also associated with a tendency to procrastinate (Sirois et al., 2003; Sirois, 2007). As noted by Sirois (see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective), over time, these tendencies are likely to create vulnerabilities in the future self for the development of chronic disease.

In order to better grasp procrastinators' future self-discontinuities, we must understand how the self may achieve continuity through time. Before moving on to discuss the psychological processes that can enhance a person's connection to the future self, we first provide a brief review of consciousness and the self. We hope that this short venture into the Jamesian philosophy of consciousness will help our readers gain a broader understanding of how a person's sense of self can be experienced as past, present, and future.

SELF-CONTINUITY AND FUTURE SELF

Consciousness and the Self

Consciousness is central to our humanity; it is constant, and its stream underlies all action and thought. It is common, yet extremely private. Because of its mysterious yet undeniably essential nature, consciousness has often been the leading focus of theological, philosophical, and psychological explorations (see Seager, 2002, for an introductory review).

Western psychology and philosophy have long viewed consciousness as a fundamental part of the subjective experience underlying awareness of *self* and personal identity (Moore & Barresi, 2013). According to William James (1985, originally published in 1892), the elements of consciousness (i.e., thoughts, images, music, language, emotions) are closely linked to our perception of time, changing and flowing with every moment. James also believed that a person's sense of self can be partitioned into the "Me"—the object of thought and experience—and the "I"—the subject of thought that is able to reflect on the "Me." While the "I" can choose to reflect on or exclude each passing state at any particular moment in time, the core of the self represents the stream of consciousness as a whole, along with the "sense of activity" or emotions attached to this whole. Put together, the self represents a person's general pattern of consciousness through time, as well as the way he or she attends to certain thoughts, images, or emotions within this stream.

In a similar fashion, the German philosopher Edmund Husserl (1977), in his lecture on *Phenomenological Psychology* (originally published in 1925), described the self, or more specifically personality, as an organizer of subjective experience. He believed that although every person shares the ability to experience diverse states of consciousness, it is the way that a person organizes these states into patterns within the stream of consciousness that underlies the self. Under these views, the self offers *continuity* to a person's stream of consciousness: a unique pattern that is sustained through past, present, and future.

If the self offers continuity to consciousness, what then offers continuity to the self? As we have seen earlier with James's "I," the self also involves the ability to think about our own experience and to self-reflect such that past, present, and future selves can become the focus, and thus an element, of consciousness. As such, the stream of consciousness not only contains thoughts, images, and emotions, but is also made of many selves. Simply put, a person's core self exists at each passing moment. Through self-reflection and projection, present selves can connect to past and future selves to create a sense of *functional* identity or sameness across time (James, 1985, p. 69). Accordingly, selves that are very close to each other in time—most likely because they are more readily accessible in one's mind—should feel highly similar and continuous, as if the passing of time never broke their imaginary union.

However, as we have seen with procrastination, people differ in their ability or motivations to reflect and project to the future, such that two or more selves may feel disconnected in time (e.g., 1 week, 1 month, or 1 year down the road). In order to further our understanding of how the temporal self is fragmented, we turn our attention to the psychological processes, both affective and cognitive, that serve to foster this sameness through time. With this purpose in mind, we focus next on an important psychological tool for traveling to the future: the imagination.

Cognitive and Affective Processes

The awareness of ongoing experience and thoughts engendered by consciousness decidedly rests on the human ability for imagination (Ellis, 1995). Indeed, the primary role of the imagination is to bring mental objects that are not currently perceived by the senses to present consciousness (Byrne, 2005; Angell, 1906). These mental objects can in turn be manipulated and constructed into creative, aesthetic, and expressive narratives that offer humans a unique way of understanding the physical, psychological, and social world surrounding daily life (Moore & Barresi, 2013).

While creative, aesthetic, and expressive thoughts broadly define the imagination, philosophy has long considered our capacity for imaginative thought to transpire specifically from mental images. It is in his theory of memory and thought that Aristotle argued that images were so fundamental to fantasies of the future and memories of the past that it was "impossible to think without an image" (Thomas, 2014). He also believed that the image of a remembered or fantasized object played a central role in motivating behavior toward a desired reality (Nussbaum, 1978).

Mental imagery has been conceptualized in the psychological literature as the ability to control and manipulate cognitive "images" through all sensory modalities (i.e., touch, smell, taste, vision, hearing; Serruya & Grant, 2009; Katz, 1983; White, Sheenan, & Ahston, 1977). Imagery has also been explored in social psychology in terms of possible selves (Markus & Nurius, 1986). Reflecting Aristotle's arguments, the image of one's possible future self—what one would like to become or not to become—was found to be a strong predictor of goal-oriented behavior such that mentally holding the image of oneself voting was a direct predictor of actual voting behavior (Libby et al., 2007).

While the abilities to hold in mind and manipulate mental images are important features of mental imagery, the clarity and vividness with which these images are constructed and perceived play an important role in making mental imagery such a powerful cognitive process (Katz, 1983; White et al., 1977). For example, individuals who can generate highly vivid mental images experience this vividness both when remembering the past and when projecting to the future (D'Argembeau & Van der Linden, 2006). As such, people who can generate vivid visual mental images may feel more connected to their future self and experience a higher sense of sameness through time, or self-continuity.

Of particular interest, research by Hershfield et al. (2011b) has demonstrated that vivid *external* representations of the future self (i.e., using imagery not generated by the person) can help sustain future self-continuity and favor long-term decision-making. In these studies, participants were instructed to enter a virtual reality environment where they were faced with a digitally aged picture of themselves (avatar) or of another research participant. A confederate then asked participants questions about themselves to enhance identification to the avatar. Following these questions, participants were subjected to a hypothetical monetary allocation task to determine how much they were willing to save for retirement. Results demonstrated that participants felt more similar to their future self following digital aging and were more willing to discount present rewards (i.e., more money today) in order to increase long-term gains (i.e., more money for retirement).

In order to extend this research and explore the specific relation of vividness of mental imagery and future self-continuity, Blouin-Hudon and Pychyl (2015) asked undergraduate students across three studies to rate how connected they felt to their future self in 10 years and in 2 months (Ersner-Hershfield, Garton, Samanez-Larking, & Knutson, 2009b). More specifically, participants were shown seven pairs of circles, one representing their future

self and the other representing their present self. The first pair of circles depicted no overlap (i.e., their present self and their future self feel completely disconnected). As participants moved up the scale, each pair of circles depicted more and more overlap, with the seventh pair depicting complete overlap between their present self and their future self. For these studies, participants were also asked to answer a series of questions relating to their ability to form clear and vivid visual mental images (Marks, 1973, 1987). Results demonstrated that the ability to generate highly vivid visual mental images was predictive of a person's connection to their future self (both in 10 years and in 2 months' time).

To further these findings, Blouin-Hudon (2015) also designed an experiment aimed at manipulating one's connection to the future self in 2 months time. To achieve this, participants were randomly assigned to a future-focused mental imagery or to a present-focused meditation condition. Participants in the "meditation" condition were required to listen to a 5-min present-focused meditation recording. Alternatively, participants in the "mental imagery" condition were required to listen to a 9-min recording describing the future self at the end of the academic semester writing final projects, studying for final exams, and organizing plans for the upcoming break from a first-person (i.e., being in future self's body) and a third-person perspective (i.e., seeing future self from across the room). In both conditions, participants were required to listen to their respective recordings twice per week for 4 consecutive weeks. A questionnaire assessing trait vividness of imagery (Marks, 1973, 1987), trait empathy (cognitive and affective; Davis, 1980, 1983), vividness of the future self, empathy for the future self (Batson, Early, & Salvarani, 1997), and future self-continuity (Ersner-Hershfield, Garton, Samanez-Larking, & Knutson, 2009b) was administered at baseline, at the 2-week mark, and at the 4-week mark.

Results of regression analyses, controlling for baseline future self-continuity, revealed that participants in the "mental imagery" condition felt significantly more connected to their future self than participants in the "meditation" condition at the 4-week mark. Interestingly however, multilevel modeling analyses revealed that both groups experienced significant growth in future self-continuity and vividness of their future self across time.[a]

[a] These results may be explained by the idea mentioned earlier that selves who are closer in time naturally feel more connected and vivid (Parfit, 1971, 1987). As the end of the semester neared, future self became temporally closer and, consequently, more vivid and real for all participants.

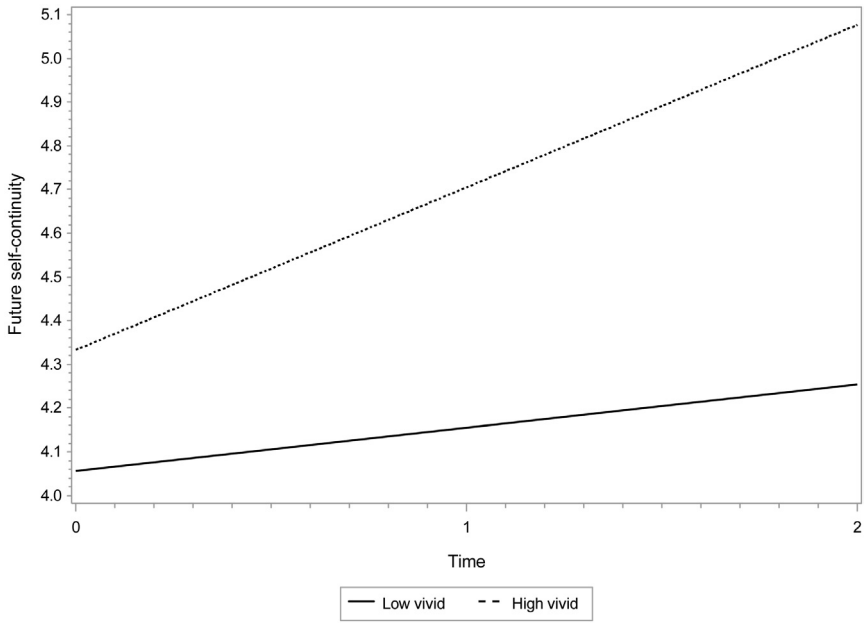

Figure 10.1 ***Future self-continuity growth through time by high and low vividness of future self.*** Low vivid, vividness of future self (person mean centered) 1 standard deviation below the mean and high vivid, vividness of future self (person mean centered) 1 standard deviation above the mean.

Of particular interest, the extent to which participants perceived their future self as vivid significantly moderated the rate of growth of future self-continuity across time over and above trait vividness of imagery (Fig. 10.1). Simply put, when the future self was more vivid to participants over the course of the experiment, they felt more connected more quickly to their future self at the end of the semester than for people for whom their future self was less vivid in the imagination. Overall, these findings illustrate that mental imagery is a particularly efficient cognitive tool for fostering and sustaining a person's sense of "sameness across time" (James, 1985, p. 69). When mental imagery is vivid, and particularly when the future self is vivid in one's mind, people feel more connected to that self.

However, only looking at vividness of mental imagery would not be enough to explain how the self can achieve temporal continuity. As we have seen, people who procrastinate are often prone to negative ruminative thoughts (Flett et al., 2012; Stainton et al., 2000) and have trouble regulating negative emotions (Sirois, 2014a). This can narrow one's cognitive scope to solely focus on the immediate and enhance the feeling that the future self is

another person, or even a stranger (Hershfield et al., 2011a). As such, positive emotions, which can broaden one's cognitive scope (Fredrickson, 2001), can also play an important role in fostering a person's sense of sameness through time.

Interestingly, mental imagery has long been thought to have a direct relationship to emotions. Certain researchers even consider emotions to be inseparable from imagery (Ley, 1979) as it has the capacity to stimulate physiological arousal similar to or of even greater intensity than direct perception (Sheikh & Kunzendorf, 1984; Ellis, 1962). Recent neuroimaging techniques have supported these conclusions by highlighting that direct perception and mental imagery recruit the same neurological substrates and lead to comparable physiological and emotional activations (Kosslyn, Ganis, & Thompson, 2001; Damasio, 1999). Results from Blouin-Hudon and Pychyl (2015) also support these findings by demonstrating that, in this particular sample, people who were able to construct vivid visual mental images also experienced more positive affective states than participants for whom this ability was not as developed. Interestingly, positive affective states were also significantly more predictive of increases in future self-continuity than vividness of mental imagery alone.

While a person cannot physically meet his or her future self, this body of research demonstrates that mental imagery can be highly efficient in simulating such an experience. Although stimulated by vivid mental images, positive affective states seem to be extremely helpful or even necessary for projecting oneself into the future and connecting to future self.

Positive affective states may have this effect on future self-continuity because they are highly efficient at broadening a person's cognitive scope (Fredrickson, 2001; Fredrickson & Joiner, 2002; Izard, 1971, 1977; Tomkins, 1962). As we mentioned in our earlier review of consciousness, the self can achieve continuity when items in the stream of consciousness are organized in a pattern that is unique to the person. It seems as if—similarly to the self—positive affective states represent both specific elements experienced within the stream of consciousness, while also having a broader, unifying effect on consciousness and the self as a whole (Ellis, 2005). Ultimately, it follows that positive affective states can enhance the feeling of the future self as an extension of the present self—as opposed to a stranger—by broadening and increasing cognitive flexibility, and as a consequence, *uniting, directing,* and *organizing* conscious states into this unique pattern through time. With respect to procrastination, this was demonstrated in reverse in a meta-analysis that examined why procrastination was consistently linked to

less future orientation (Sirois, 2014a). In keeping with these ideas, lower levels of positive affect explained in part why procrastinators were less oriented toward the future.

SELF-CONTINUITY: BENEFITS FOR HEALTH AND WELL-BEING

As we have seen, vividly imagining the future self as well as experiencing positive affective states can allow people to extend their present sense of self to the future. In turn, increased future self-continuity can allow one to regulate behavior within a broader cognitive-affective scope in ways that are beneficial for long-term well-being.

Self-continuity is also important for well-being as it provides coherence and stability to a person's sense of self and identity (Chandler, 1994). It is through this coherent and stable sense of temporal selfhood that a person is able to adaptively interpret and organize information, generate appropriate emotional responses, and effectively guide goal-oriented action necessary for the execution of daily behaviors (Damasio, 2010; Greenwald, 1980). Supporting this, Blouin-Hudon (2015) found that participants who felt more connected to their future self at the 4-week mark also experienced greater decreases in procrastination.

Furthermore, support for the idea that future self-continuity can help a person adaptively cope with negative situations has been highlighted in recent research by Sadeh and Karniol (2012). Results of this study demonstrated that people who had suffered job loss reported lower self-continuity and demonstrated less adaptive coping over time. However, people who suffered job loss but maintained a continuous sense of self were able to use adaptive coping strategies such as seeking social support and approaching challenging tasks while unemployed. This illustrates that people who experience high self-continuity are able to link their past employed self and project it into the future. Doing so decreases the focus on the present unemployed self as sole reference for identity and allows behavior to be organized in a way that will not only benefit their present self, but that will also assure lasting positive outcomes (i.e., employment) for their future self.

Self-continuity, and future self-continuity in particular, is also beneficial for physical health. In addition to reducing stress and improving coping, two important predictors of physical well-being (Taylor & Sirois, 2014), feeling connected to a future self, or at least considering how current actions may affect the future self, are essential precursors for engaging in a variety of

health-protective and health-promoting behaviors such as eating a healthy diet, engaging in regular physical activity, and managing stress. Importantly, these health behaviors are commonly referred to as modifiable risk factors for the prevention of illness and chronic disease (World Health Organization, 2011; see Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective).

CONCLUSION: A FOCUS ON THE PAST

The aim of this chapter was to highlight some of the temporal discontinuities found in procrastination. We began by briefly reviewing how self-regulation failure can be linked to the needless delay of an intended task. Furthermore, we demonstrated that individuals who procrastinate suffer in their ability to adaptively self-regulate negative states and, as a possible consequence, to mentally time-travel to the future. However, procrastination is particularly self-defeating because individuals fail to consider their future *self*'s well-being. As such, our main focus was to demonstrate why and how procrastinators disconnect from their future self and how this can have very negative consequences on a person's long-term health and well-being. To further understand procrastinators' present-future self-discontinuity, we reviewed evidence demonstrating how important processes of the imagination, more specifically the ability to construct and hold vivid mental images, can operate alongside positive affective states to foster and sustain the temporally extended self. Finally, we have demonstrated how extending one's self to the future can have important benefits for health and well-being.

Although we mainly focused on the benefits and problems associated with connecting and disconnecting from the *future* self, there is evidence to suggest that connecting to one's past self is also important for sustaining overall self-continuity and, as such, in influencing long-term well-being. In fact, the mental time-travel literature (Suddendorf & Corballis, 2007) suggests that episodic or autobiographical memory can be extremely useful for remembering particular details of past events. The ability to vividly remember these particularities is in turn necessary for the construction and elaboration of complex and multisensory scenes of the future (Suddendorf & Corballis, 1997). Similar evidence has been related to the temporal self such that episodic or autobiographical memory also appears to be essential for sustaining self-continuity from the past to the present (Bluck & Liao, 2013; Singer & Bluck, 2001). Finally, nostalgia, a form of autobiographical thought which involves reminiscences about the past, has been linked

to experiencing positive affect (Baldwin & Landau, 2013), and meaning-making (Routledge, Wildschut, Sedikides, Juhl, & Arndt, 2012), suggesting that connecting to the past may be important for finding continuity and meaning for the self.

To fully understand procrastination in relation to the temporal self, much has yet to be said about how we remember and construct our past self. Based on temporal self-appraisal theory, more positive events are perceived as closer in time, while more negative events are perceived as far away in time, as if they happened to another person (Wilson, Gunn, & Ross, 2009). If a past self is viewed under a more positive light, it is possible that this self may feel temporally closer (and thus more connected, more similar) than a self that is viewed in a more negative light. After people procrastinate, they often experience guilt (see Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination), increases in stress, and other negative emotions (Pychyl et al., 2000). As such, there is evidence to suggest that when people reflect on their past procrastinating self, they may view that self in a more negative light and as such, as very far away in time and less connected to who they are today. Ultimately, if remembering past events in detail is helpful for vividly imagining the future, then a past self that is viewed more negatively and with less detail may greatly reduce the chances of imagining a future self that is vivid and that feels like a direct extension of present self. An exploration of this possibility would bring research on self-continuity and procrastination full circle. In this case, the past is truly an interesting avenue for the future.

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CHAPTER 11

Procrastination and Well-Being at Work

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INTRODUCTION

As this book clearly shows, with the exception of a few community samples (Ferrari, 1993; Sirois, 2007; Sirois & Kitner, 2015), most studies on procrastination relate to academic procrastination and have been conducted with college and university student samples. There has been very little research attention to procrastination at work, and the few studies that have been conducted do not always address well-being but instead focus on other issues in relation to procrastination, for example, the types of jobs procrastinators occupy (Nguyen, Steel, & Ferrari, 2013). This chapter addresses procrastination at work and how it may affect well-being based upon research focusing on avoidance behavior at work, as will be explained later. After a brief discussion of how to define procrastination, an overview is provided of what we may learn from the studies conducted so far. A conceptual framework is then presented that may guide future research in this area.

DELAY AND PROCRASTINATION

First, it is important to provide a definition of procrastination. van Eerde (2000, p. 375) defined procrastination as delay due to "the avoidance of the implementation of an intention." Mostly, the avoidance concerns an aversive task, or at least something less attractive than an alternative that can be acted upon. This delay is often seen as irrational as the individual realizes it is needless delay; the individual should do it but does something less important instead. Clearly, this behavior has moral connotations associated with the idea that only lazy or unreliable persons engage in this behavior, and that they should be ashamed about such behavior (see Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination for a discussion of shame and social norms).

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Procrastination is most often studied as a trait or a disposition. Trait (or chronic) procrastination is considered the tendency to delay intended actions despite expecting to be worse off. This tendency appears to be stable, and some personality traits, such as conscientiousness, are highly (negatively) related to procrastination (Lay & Brokenshire, 1997; Steel, 2007; Watson, 2001).

Procrastination may also be seen as a state or a process. A definition of this phenomenon is complicated due to its subjective nature; what may seem to be delay to one person may be on time to someone else. What is reasonable? Procrastination can only be defined depending on the intention of a person and the delay of action with regard to this intention (intention-action gap). If a person plans or intends a delay, it is not procrastination but may be referred to as strategic delay (Klingsieck, 2013b). Procrastination is often viewed as a failure to self-regulate or to use self-control or will-power, that is, the failure to adapt behavior to difficult and tempting situations (Sirois & Pychyl, 2013). The tempting, usually easier, option is acted upon rather than dealing with the intended, more effortful, action. As such, procrastination is avoidance behavior: the delay provides temporary relief from the difficult intention. In this chapter, I will focus on research on avoidance behavior at work, as the label procrastination has not been used frequently. But first, I compare procrastination in the academic and work domains.

STUDENT PROCRASTINATION AND PROCRASTINATION AT WORK

One of the basic questions in procrastination research is whether it is a general behavior that is displayed independent of its context, or whether it is specific to particular domains, where persons procrastinate in their study, but not in other domains, for example, at home doing administrative tasks. Klingsieck (2013a) concluded, based upon measurement in different domains, that it is better to consider the domains separately. People typically procrastinate in certain domains, particularly academic and work domains, on everyday routines and obligations, and health issues. They procrastinate less in the domain of family and partnership, or in relation to social contacts. Unfortunately, Klingsieck's (2013a) study, conducted among students, did not consider the academic and work domains separately. Similarly, a meta-analysis on self-control (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012) combined school and work. However, it is important that school and work be considered separately because the circumstances in which the behavior takes place are different.

Many studies have been devoted to student procrastination, whereas studies on procrastination in the working population are relatively rare. This is understandable for different reasons. First, students may be recruited to participate in studies more easily. Often, students volunteer for studies out of a need to cooperate in return for study credits or in exchange for small amounts of money. In contrast, employees need to be recruited and convinced to participate, the organizations in which they are employed need to be convinced of the need to study certain behaviors, and many other practical reasons may stand in the way.

A second reason for the popularity of student samples is the research design advantage of students having common assignments and deadlines. This is helpful in the study of procrastination; if the context and demands are similar, the outcomes can be more plausibly attributed to differences between the respondents. Most of what students need to do in terms of academic achievement is under their individual control, apart from working in groups and being supervised by teachers. This makes for a valid comparison of outcomes of behavior.

In contrast to the academic context, the work context provides more variable demands in different jobs. Even if job titles are the same, the demands may differ between organizations or units, depending on their structure and management. In terms of performance, individual contributions are not easily distinguishable; indicators of performance often reflect combined efforts of team members.

Meta-analyses of the existing literature (based largely on student samples) have shown that there is a negative relation between age and procrastination (Steel, 2007; van Eerde, 2003). This may perhaps indicate that procrastination may be less problematic for older people, although there is no direct evidence in this regard, as the level of procrastination and experienced problems due to procrastination have not always been distinguished clearly (Haghbin, 2015). What we do know is that many students indicate that they have a high tendency to procrastinate on academic tasks, and a substantial number of them experience problems because of it (Pychyl, Lee, Thibodeau, & Blunt, 2000). These students enter the labor market at some point in time. However, not much is known about how students' procrastination translates to work life.

The transition from student to employee may be hampered by procrastination, as students who procrastinate may be less motivated to apply for jobs (Senécal & Guay, 2000). Procrastination is negatively related to actions needed for a job search (Lay & Brokenshire, 1997; Renn, Steinbauer, Taylor, & Detwiler, 2014b; Turban, Lee, Veiga, Haggard, & Wu, 2013; Van Hooft,

Born, Taris, van der Flier, & Blonk, 2005). For example, Turban et al. (2013) hypothesized that procrastination would be one of the predictors of the intensity with which recent graduates were engaged in behaviors related to the job search process, such as locating job openings and filling out job applications. The authors tested a larger model in which positive and negative affect and planning (motivational control) were also investigated. After 1 year, they measured whether these variables had affected the outcomes of the job search. They found that procrastination is not a predictor of job search intensity over and above the effects of affect. However, procrastination was directly negatively related to receiving invitations for job interviews. These studies provide evidence for the importance of procrastination in the transition between graduation and finding a first job.

After the transition phase in which students look for jobs, students enter into work life. As far as could be determined, only one study tracked students over a longer period of time before and after the transition into work life. This study measured task avoidance as a study strategy and followed the student participants over 17 years, long after they had graduated (Salmela-Aro, Tolvanen, & Nurmi, 2009). This study clearly shows that the achievement style used at university predicted their vulnerability to burnout after 10–17 years. A high level of task avoidance during university predicted a high level of burnout and a low level of work engagement during the early career years. The authors concluded that task avoidance strategies are a risk for well-being in the workplace.

In addition, there are some studies that show that procrastination may be a problem for populations other than students. For example, procrastination and maladaptive coping with stress were more strongly related in community samples than in student samples (Sirois & Kitner, 2015). Thus, it appears to be worthwhile to focus more on the implications of procrastination for well-being at work. In sum, the setting complicates matters, and although less research is available on community and work samples than on students, it is important to study procrastination in the work context specifically. In the next section, I discuss research on procrastination at work in relation to well-being.

A CONCEPTUAL FRAMEWORK FOR WORKPLACE PROCRASTINATION

The conceptual framework presented in Fig. 11.1 guides this discussion. The framework proposes an interactional approach: both the characteristics of the person and of the work context are important to the occurrence of

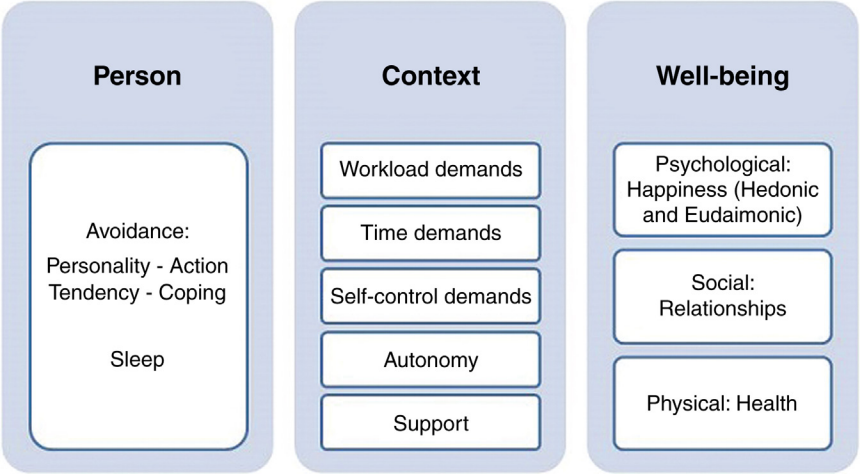

Figure 11.1 Conceptual framework.

procrastination and its effect on well-being at work. The exact relation of person and context factors may differ according to which factors are involved. Sometimes, the context makes the occurrence of certain behaviors less likely, and sometimes they enhance particular behaviors of the person.

With regard to characteristics of the *person* at work, I consider personality first, focusing on nonclinical aspects of personality. I then discuss procrastination as avoidance behavior. Avoidance can be considered a relatively stable aspect or a personality trait, but can also be viewed as momentary tendencies, when people appraise certain situations as threatening and when they cope with the threatening situation using avoidance coping strategies (Mackey & Perrewé, 2014). This should be viewed in light of the total amount of energy a person has, or the resources needed for self-regulation. Sleep is important in this respect (see Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency for a discussion of sleep as a health behavior). With regard to the *context*, I suggest that although some people are more prone to show avoidance due to their personality, procrastination will be likely to occur more in some settings than in others based upon selection, both formal and informal (Schneider, 1987) and according to situational strength (Mischel & Shoda, 1995; Tett & Burnett, 2003), as explained later. Based upon a conceptual model of time management (Burt, Weststrate, Brown, & Champion, 2010), time demands, autonomy, and support are included. In addition, self-control demands related to the task that needs to be executed and the broader aspects of the work environment are

considered (Diestel & Schmidt, 2011; Schmidt, Hupke, & Diestel, 2012). Three types of *well-being* may be distinguished (Grant, Christianson, & Price, 2007) and each of them may be affected by procrastination. In the next section, I discuss well-being, person, and context in more detail.

CHARACTERISTICS OF THE PERSON

Given that there are only a few studies that addressed procrastination in a work context, I draw on studies that do not specifically identify procrastination; however, they address a similar phenomenon using the labels avoidance, counterproductive work behavior, and withdrawal behavior. I also discuss the energy level that is needed for the demands posed at work, and how sleep and self-regulation are related.

Renn and colleagues included managers' assessment of the procrastination of their employees in their studies, as a particular type of self-defeating behavior (Renn, Steinbauer, & Fenner, 2014a; Renn, Allen, & Huning, 2013). It is questionable whether managers can assess procrastination of their employees. They can assess lack of punctuality and delay, as was done in the study. It is unclear, however, what the meaning of such ratings is if no self-assessment is included that addresses the needless intention-action gap. The lack of punctuality in these studies are linked to negative outcomes, but well-being was not assessed.

Some studies have actually assessed self-reported procrastination in work settings in relation to well-being. For example, Glazer, DeArmond, Matthews, and Bunk (2014) concluded that occupational stressors are related to procrastination and that this relationship can be partially explained by psychological detachment and fatigue. More recently, van Eerde and Sirois (2015) showed that the relation between procrastination and life satisfaction was mediated by the quality of the relation with the colleague in colleague dyads.

Others have considered avoidance behavior from a clinical perspective. In extreme cases, procrastination may be considered a dysfunctional behavior that requires a clinical approach (Höcker, Engberding, Beissner, & Rist, 2009). Procrastination may be categorized under the avoidant–passive aggressive or dependent type, considered the "dark side" of personality as studied at work (Furnham, Hyde, & Trickey, 2014). The avoidant–passive aggressive or dependent type tends to be relatively unsuccessful at work. However, some other traits associated with the "dark side" of personality, such as narcissism, may actually fit with and may lead to success in some organizations (Furnham et al., 2014). For avoidance behavior, this is unlikely.

In this chapter, I focus on avoidance of the nonclinical population specifically, as less extreme cases may be expected to be more prevalent. In this respect, two more concepts used in research on work may refer to procrastination: counterproductive work behavior and withdrawal behavior.

Counterproductive Work Behavior

Some may say that procrastination is counterproductive work behavior, behavior directed against other individuals or against the organization that employs the individual. Counterproductive work behaviors that may be linked to procrastination are, for example, time theft, that is, using an employer's time for personal benefits (Lorinkova & Perry, 2014), and absenteeism, not being present at work, as well as presenteeism, being at work but not engaging in the behaviors required for the job (Koopmans et al., 2011). However, time theft may also be strategic delay, if the delay is purposeful and intended to hurt another party or intended to benefit the individual who delays. Delay may be used strategically at work and may involve politics, for example, using stalling tactics during negotiations (Alon & Brett, 2007). Absenteeism comprises illness and counterproductive behavior, such as when the absence is used for other reasons. Losing time and delay because of cyberslacking may be either strategic or self-defeating (O'Neill, Hambley, & Bercovich, 2014). Kim and Byrne (2011) make a distinction between aimless, strategic, and problematic Internet use in work contexts.

Procrastination should probably not be classified under the heading of counterproductive work behavior because the framework of counterproductive work behavior explicitly excludes self-destructive acts (Marcus, Taylor, Hastings, Sturm, & Weigelt, 2013), and this does not match with the self-defeating nature of procrastination. In many cases, procrastination is indeed self-defeating because it implies delaying even when an individual expects to be worse off because of this delay.

Withdrawal Behavior

Procrastination as a failure of self-regulation would instead most likely be termed withdrawal behavior in the work-related literature, indicating that someone avoids certain behaviors. Employee withdrawal is negatively related to conscientiousness (Mawritz, Dust, & Resick, 2014) and may be similar to procrastination. However, withdrawal can also be a purposive decision to detach and move away from problems (Mawritz et al., 2014). To complicate matters, counterproductive behavior and withdrawal cannot be easily distinguished empirically, as a recent meta-analysis showed (Carpenter &

Berry, 2014). Carpenter and Berry's (2014) framework regards withdrawal as a form of organizational counterproductive work behavior. In my opinion, it may perhaps be better to call it unproductive or dysfunctional work behavior, as counterproductive sounds as if an intention to hurt another party is present.

Overall, avoidance behaviors at work using different labels are highly interrelated (Metin, Taris, & Peeters, 2015), and research on avoidance behavior at work shows that it is negatively related to outcomes in terms of performance and relations. Notwithstanding the low number of work-related studies, it is likely that procrastination at work is related to negative outcomes, including lower well-being.

Well-being at work may be defined as the overall quality of an employee's experience and functioning at work (Warr, 1990). Well-being has psychological, social, and physical dimensions and can thus be studied in three different ways: focusing on happiness, relationships, and health. Work and the way it is managed can influence all three types of well-being (Grant et al., 2007). Psychological well-being refers to the absence of pain and the experience of pleasure (hedonistic well-being) and to the meaningfulness of experiences, and the fulfillment of human potential (eudaimonic well-being). Social well-being refers to how people experience relationships at work, and whether these can be considered harmonious, such as when trust and cooperation are high. Physical well-being typically refers to physical fitness, and the absence of illness and work stress. Stress is a fuzzy concept, assumed to occur when environmental stimuli (stressors) overtax an individual (Sonnentag, Pundt, & Albrecht, 2014). Taken together, it is important to underscore how procrastination may affect different aspects of employee well-being, including their stress (see Chapter 1, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being for a consideration of the effects of procrastination on stress, health, and well-being).

Another behavior that we might consider is sleep (see also Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency). If we consider that resources are needed for self-regulation, it is important to focus on sleep. Sleep helps us to replenish and recover. Indeed, some research shows that fatigue and procrastination are related (Glazer et al., 2014; Sirois, van Eerde, & Argiropoulou, 2015). Lost sleep might result in using easier options at work, such as has been shown in relation to cyberloafing (Wagner, Barnes, Lim, & Ferris, 2012). In general, cyberloafing is strongly linked to a lack of self-control (Restubog et al., 2011). In addition to the three types of Internet use, as distinguished by Kim and

Byrne (2011), aimless, strategic, and problematic Internet use, the personal use of the Internet at work may also be seen as a way to recover from fatigue, boredom, or stress (Ivarsson & Larsson, 2011). Similarly, sleep hygiene predicted work engagement through two mediators: self-control and psychological strain (Barber, Grawitch, & Munz, 2013). An intervention study by Drozd, Raeder, Kraft, and Bjørkli (2013) showed that replenishing resources when feeling stressed was important. They showed that training that included mindfulness principles reduced stress via the reduction of procrastination, demonstrating that procrastination may be a reduced by training, and thereby alleviating stress.

Some research investigated whether procrastination is a precursor of burnout. A group of employees counseled as part of an employee assistance service were involved in the study. A model in which perfectionism (or the concern about making mistakes) was theorized to predict burnout, mediated by procrastination, was not supported (Philp, Egan, & Kane, 2012). Another study showed that avoidant coping mediated the relation between perfectionism and psychological distress (Dunn, Whelton, & Sharpe, 2006). Similarly, Zuckerman and Gagne (2003) found a relation between avoidance coping and burnout that was quite high ($r = 0.52$).

In summary, there are only a few studies that investigated procrastination in the workplace. More studies have been devoted to avoidance behaviors at work. Typically, withdrawal and counterproductive behaviors have been studied. These have been linked to negative outcomes at work, both in terms of performance and well-being. It is important to consider that procrastination is a particular type of avoidance, that is, the failure of self-regulation, self-defeating behavior that results in delay. An important person factor in addition to avoidance is sleep. Sleep helps to replenish and to recover, and feeling tired may break down the strength needed for self-regulation. That is, we should consider that there are buffering mechanisms in the relation between person and context characteristics, and sleep is an important one. In other words, "High sleep quality increases the availability of limited resources and trait self-control ensures efficient usage of that resource" (Diestel, Rivkin, & Schmidt, 2015, p. 821).

In the next section, I will consider the work context and discuss how it may shape the occurrence of procrastination. Since most organizations select their employees, it may be that those who have a high tendency to procrastinate may not be hired, such that procrastination is less likely to occur in the workplace in comparison to academic procrastination. Also, some characteristics of the work context may prevent procrastination.

CHARACTERISTICS OF THE CONTEXT

An important difference between students' procrastination and procrastination at work is that work is performed in an exchange relation. That is, individuals are employed and work for others, or they are self-employed and deliver products or services to others in exchange for money. Although students work in some sort of exchange situation, in which their efforts are expected, there is normally no exchange of money if a student succeeds, although the exchange of grades for effort and performance may be seen as such to some degree. Work usually involves more cooperation with others because most organizations have adopted teamwork as a leading principle, and employees usually have supervisors who direct and coach.

Besides the exchange relation being dominant in work relations, it is possible that procrastination is more likely in certain professions (Nguyen et al., 2013), where those who are high on procrastination appear to be in jobs that are less investigative and enterprising. One study showed that white-collar employees provided higher self-reports of procrastination than blue-collar employees (Hammer & Ferrari, 2002). However, Hammer and Ferrari do not explain why there may be differences. Two explanations may be given: selection and situational strength.

Selection

Formal selection restricts the type of persons in organizations mainly according to education and other desirable characteristics such as intelligence, discipline, and resilience. But also informal self-selection of certain personalities in particular jobs or organizations takes place. There are strong indications from the research on the attraction–selection–attrition framework that this happens in organizations (Schneider, 1987). Over time, organizations become more homogeneous in terms of personality because similar types of persons are attracted to the organization, and dissimilar persons tend to leave. Nguyen et al. (2013) provide this as their main explanation for their findings of how procrastination relates to how people end up in certain jobs. People may have been selected for the jobs such that they will not procrastinate even if the situation would allow it, and this may be part of someone's personality. For example, Nguyen et al. (2013) found that military officers do not tend to procrastinate. In contrast, those who are high in procrastination can be found in jobs serving food.

Situational Strength

Mischel and Shoda (1995) theorized how personality expresses itself in strong versus weak situations. Many work situations may be considered strong situations: the leeway offered of possible behaviors is somewhat restricted, and may thus override the natural tendencies of a person to act based upon personality traits. For example, if a job is well structured and goals are set and monitored by others and rewarded, conscientious behavior is encouraged. Even those who may be unlikely to act conscientiously in other situations when left to their own devices, are encouraged to such a degree that the differences between high and low conscientious individuals may disappear; due to the situational strength, all display the desired behavior. Or, as in the study on white-collar and blue-collar workers, blue-collar work may be seen as standardized and routinized, a strong situation. The variety of workers' personalities is less likely to show in these types of jobs, since the variety in different actions is limited because it is not permitted or required. This might also explain lower procrastination.

In other words, some situations do not allow variation in behavior, and therefore the avoidance cannot be expressed. Building on Mischel's work, trait activation theory has gained support when studying personality in a work context (Tett & Burnett, 2003). Personality traits should be studied in relation to the relevant aspects of the situation. If the situation is weak rather than strong, it leaves room for behavioral options, such that personality will be expressed rather than suppressed. In strong situations, there is not much room for individual differences and the expression of traits is relatively low. Thus, some situations, tasks, or work environments may make procrastination more likely than others (Harris & Sutton, 1983). Harris and Sutton (1983) proposed a framework for research that identified several dimensions relevant to procrastination on a specific task. This framework proposed perceived task characteristics of the focal task, such as difficulty, ambiguity, appeal, and deadline pressure, to be relevant. In addition, the relation of the task with other tasks, in terms of the interdependence and relative importance were identified. Furthermore, organizational systems may play a role, such as the reward system, the normative system, and the information system. These influences would be moderated by the discretion allowed in the task because only if there is some discretion could the differences be expressed. The framework did not include any personality factors, and it never has been tested empirically. However, this framework shows that there are issues to consider in the context that play a role in procrastination; not only the individual's personality, but also the task that is executed is relevant, and how the task is embedded in the organization.

Building on the framework, other dimensions of the work situation may be identified. Taking into account that procrastination is related to individuals' self-regulation, aspects of the situation which are related to individual differences in self-regulation would appear to be relevant. The following aspects are proposed: autonomy, time demands, self-control demands, and support.

Autonomy

Autonomy, although important to consider, is somewhat paradoxical in nature. On the one hand, autonomy creates a weak situation, and it may trigger procrastination when it is considered threatening to those who are prone to avoidance. This may go hand in hand with negative outcomes.

On the other hand, insufficient autonomy may lead to stress because people may not be given the discretion to handle the demands of a job. The demand-control model of stress (Karasek et al., 1998) identifies this as particularly stressful if there are problems such as overload; the person is not provided with the resources or permission to change the situation. This lack of control is often identified as a source of work stress. Thus, in general, autonomy is considered a positive and empowering dimension of work, but for those who are avoidant, it may lead to negative outcomes in terms of performance and well-being. They may lack the self-control to perform on time, which may lead to increased stress. This would suggest that autonomy should be considered in comparison to the need for each individual for autonomy, in other words, the autonomy fit. Some need a great deal of autonomy and others do not. If this is taken into consideration, a fit between the individual and job is a better idea than a general notion of the degree to which a job needs to have certain characteristics. This may be the case with procrastination (Nguyen et al., 2013). Procrastination was found to be higher in constrained jobs, where less autonomy was required. Nguyen et al. (2013) interpreted this as support for the gravitational hypothesis that posits that people gravitate toward certain jobs. In another study on job autonomy, Prem, Scheel, Eckert, Gerdenitsch, and Korunka (2015) suggested that the relation between the relation between job autonomy and procrastination would be moderated by self-efficacy, such that the relation would be weaker for those who are high on self-efficacy. However, they did not find this interaction nor did they find a direct relation between autonomy and procrastination. Thus, the research so far on job autonomy and procrastination appears to indicate that autonomy fit may explain why people are in different jobs, but that there is no straightforward relation between experienced autonomy and procrastination.

Time Demands

In addition to the typical demands defined as workload, time demands may also differ between types of work (Burt et al., 2010). Not only the pace or speed at which a job needs to be performed, but also the time frame or cycle, the predictability and possibility to plan actions may differ. Service-oriented or highly standardized jobs may require mostly reactive demands, rather than, for example, creative jobs that need planning and evaluation. Reactive jobs leave little room for procrastination; emergency situations require immediate action, and procrastination is simply not allowed.

Self-Control Demands

Schmidt and Neubach (2007) conceptualized self-control demands as the demands that jobs pose on self-control. They distinguished the following three characteristics: impulse control, resisting distractions, and overcoming task resistance. Each is explained here.

First, work that requires impulse control demands refers to the extent to which a job requires inhibition of spontaneous reactions and affective states in order to maintain controlled, purposeful behavior. Impulse control is important when people need to inhibit spontaneous reactions at work, such as weighing words before speaking.

Second, the demands that are posed on individuals in resisting distractions may be seen as a self-control demand that may vary over time and jobs. These demands are related to the degree to which work tasks require actively fading out and not giving in to and ignoring distractions. Resisting the temptation to be distracted is particularly needed in work settings (Hofmann, Baumeister, Förster, & Vohs, 2012). Others at work may serve as a source of distraction, which may be conducive to the avoidance of certain other obligations. The conflict between the social expectations which may be interesting, fun, and relaxing, and obligations toward oneself may be at the root of procrastination, and is sometimes referred to as a "should-want conflict" (Milkman, Rogers, & Bazerman, 2008).

Some jobs, such as management jobs, are typically highly fragmented and only have uninterrupted slots for individual work that last a few minutes (Tengblad, 2006), yet may need concentration. This requires not only good planning but also assertiveness and concentration at the right moment. Avoidance of particular tasks may then become likely because they might disappear in the midst of many other tasks. Overall, many jobs are characterized by distraction and, as such, this is an important dimension.

Third, there may be work demands that require overcoming resistance toward the activities required. If these demands are high, employees need to overcome inner dislikes of or aversions in dealing with unattractive work tasks (Diestel & Schmidt, 2011). The third (overcoming resistance) and second (resisting distraction) types of self-control demands appear to be more relevant for procrastination than the first one (inhibition). A series of studies provide evidence for the notion that these three types of self-control demands form a specific type of stressor at work that explain additional amounts of variance in indicators of strain (such as depressive symptoms, burnout, and absenteeism) over and above that accounted for by other work stressors, such as workload, role stress, and lack of social support (for an overview, see Schmidt & Diestel, 2015). There are also certain factors that may weaken the effects. So far, affective commitment to the organization, job control, and the capacity for self-control were shown to buffer the negative relation between self-control demands and strain. Other factors appear to strengthen the effects of self-control demands on strain and absenteeism. These are cognitive control deficits, conflicting goals, and the simultaneity of the three demands (the simultaneous presence of the demands appear to amplify their effects).

Support

Another aspect of the job to consider is support: does an organization provide the conditions in which employees can actually manage their time well (Burt et al., 2010)? Is there sufficient structure and clarity to act upon priorities? And, moreover, do peers and supervisors offer social support and cooperation to execute the work as desired? Peers and supervisors may affect the occurrence of procrastination because interdependence leads them to monitor the behavior of others. This social control may help the procrastinator. In contrast to academic procrastination, where many students may lack the self-control to study, more control may come from others in the work setting. Of course, individuals can still shirk responsibility in teams, in other words, engage in social loafing (Ferrari & Pychyl, 2012). This behavior occurs more frequently as teams are larger and when the contribution of each individual becomes less visible (Liden, Wayne, Jaworski, & Bennett, 2004), suggesting that interdependence helps social control and as such reduces avoidance behavior. Making individual contributions visible by explicit comparisons of individual performance in teams helps to prevent social loafing (Lount & Wilk, 2014). Social norms about what is fair in terms of input and output then become evident. Overall, colleague support

can serve as a buffer to alleviate difficult demands that may lead people to procrastinate.

The role of the supervisor in relation to how employees use their time was investigated in several recent studies (Gevers & Demerouti, 2013; Mohammed & Nadkarni, 2011, 2014). Strong temporal leadership is positively related to performance, especially when teams are diverse in their styles in working toward deadlines. The question of which type of leadership exactly would help or hinder employee procrastination has not been investigated yet, but based upon the previous dimensions, leadership that supports, structures, and monitors would appear to be helpful, especially if directed to those who need it more (Gevers & Demerouti, 2013). Leaders may affect the emotion management and health of their employees (Kaplan, Cortina, Ruark, LaPort, & Nicolaides, 2014; Wegge, Shemla, & Haslam, 2014). Particular types of leadership, such as servant leadership, emphasizing leader behaviors that focus on followers' support rather than self-interest, were found to be related to higher well-being of employees (Rivkin, Diestel, & Schmidt, 2014). In general, effective leadership consists of two types of behavior: consideration (socioemotional guidance) and initiating structure (directions and corrective behavior). Both support and structure are at the basis of procrastination interventions (van Eerde, 2015) and thus appear to be important in helping to reduce procrastination, and in turn helping to enhance well-being.

Another interesting issue is how supervisors' procrastination might affect their subordinates' well-being. A passive-avoidant leadership style, which can be characterized as reactive to problems, or "laissez-faire" without correcting subordinates, might indicate that a leader procrastinates. This style has been shown to relate to burnout of employees (Hetland, Sandal, & Johnsen, 2007). Laissez-faire leadership is associated with the presence of many stressors at work, including role conflict and bullying (Skogstad, Einarsen, Torsheim, Aasland, & Hetland, 2007), and may be conducive to employee procrastination as well. Yet, leadership that is too controlling may lead to avoidance and anxiety as well. Here, a general similar paradoxical nature of supervisor control can be seen as for autonomy; too much or too little would probably be conducive to procrastination. Here again, it may be better to consider the interaction between the supervision and the needs of the employee.

Summarizing, both person and task characteristics are important to consider, and the predictions of what is suboptimal for procrastination and how it subsequently may influence well-being are not straightforward. Much

depends on whether persons have the tendency to display avoidance behavior in the first place. Some may not even be selected in certain jobs. Whether procrastination occurs in the job needs to be considered, as well as the context in terms of the demands of the job that may enhance or diminish procrastination. In addition, the normative part is important because the way in which others in the workplace react to procrastination will influence the individual's behavior. In particular, the individual's role within a team is important, as well as the way in which a supervisor structures the work and supports individuals in their goal pursuit.

CONCLUSIONS

After establishing a definition of procrastination, I compared the procrastination of students with that of procrastination in a work setting. As work settings can have many different context characteristics, the study of procrastination at work requires more than personality assessment. Several dimensions of the work context were identified that may influence the occurrence of procrastination in work settings. Formal selection and self-selection play a role. Autonomy and supervisory control are most clearly shown to be in need for a fit perspective—where a good fit between job and person leads to optimal results in terms of productivity and well-being, but perhaps all demands (time, self-control) need to be viewed from this perspective. The research so far is not conclusive to make this recommendation. Support and sleep are proposed as buffers that will help to overcome possible negative effects in terms of well-being.

STRENGTHS AND LIMITATIONS

This chapter provided a broad overview of concepts that may be relevant in the study of procrastination and well-being at work that have not been combined before. For example, self-control demands and procrastination at work have not been integrated before. Different factors, individual and the behavioral processes, as well as team and wider organizational factors, were considered. However, the overview is by no means complete. Some research on avoidance, such as that on prevention and promotion regulatory focus at work (Hamstra, Van Yperen, Wisse, & Sassenberg, 2011), has not been included due to space limitations. Nor could this overview provide the exact ordering of processes or specify which type of well-being particularly would be affected by which type of context and/or personal characteristics.

However, researchers may take some ideas for closer investigation in future research. In the next section, I provide some suggestions of interesting avenues for research.

FUTURE RESEARCH DIRECTIONS

First, as indicated in the beginning of the chapter, there is a need to find out how students experience the transition from student to work life with regard to procrastination. Some studies on job search provide information on the role of stable individual differences in this transition. However, employing longitudinal designs such as that which Salmela-Aro et al. (2009) employed should provide more insight into role of personality over different life phases and in different contexts. In other words, it would be interesting to know whether the behaviors displayed by students are predictive of their behaviors in other phases in their lives.

Second, future research needs to study context in more detail. Self-control demands, as perceived by the individual (Diestel & Schmidt, 2009; Schmidt & Diestel, 2015), have been studied in work contexts. However, it may be interesting to measure the demands in studies on academic procrastination as well. Schmidt and Diestel do not refer to procrastination, but this would be highly relevant. More suggestions for future research are provided in Schmidt and Diestel's (2015) overview article. They suggest that self-control capacity buffers the effect of self-control demands. This implies a self-control fit approach: even though self-control demands may be perceived as high, those who have the capacity to deal with these demands will be affected by it to a lesser extent. It would be interesting to see whether (self-) selection takes place for these particular demands.

Third, the role of colleagues and supervisor in the occurrence of work procrastination has not been investigated. van Eerde and Sirois (2015) studied colleague dyads, but there are very few studies on teams or leadership that might reveal more about the social context of procrastination. The norms in the social group and the extent to which others offer support, and to some extent compassion, may affect both procrastination and well-being.

Finally, the issue of domain specificity remains interesting. Do different domains lead to similar reactions or do people find different ways to deal with difficult tasks differently across the domains? A preliminary study shows that procrastination is much higher among students than young adults at work and that those who combine both work and study procrastinate more in their study (Lakatos & van Eerde, 2015). We know that there are differences

between domains in which people procrastinate (Klingsieck, 2013a), but work and study have usually been considered within the same domain. This chapter aimed to show that work procrastination deserves a separate approach. Future research may focus specifically on work procrastination, and hopefully it will benefit from the framework presented.

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CHAPTER 12

Future of Research on Procrastination, Health, and Well-Being: Key Themes and Recommendations

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Research focused on understanding the consequences of procrastination for health and well-being has reached a critical mass of sorts, making this first edited volume on the topic both feasible and important. Ten or 15 years ago, such a volume would have been premature in relation to well-being outcomes, and simply not possible from the perspective of understanding the physical health implications of procrastination. Now, with a growing number of researchers turning their attention to this important topic, this current volume is not only timely, but in many ways necessary. In presenting the latest theories, perspectives, and evidence on how and why the unnecessary delay of important intended tasks may take a toll on both physical and psychological health, the chapters comprising this book make it quite clear that these consequences are neither trivial nor transitory, and in many instances can contribute to lasting vulnerabilities for poor health and well-being.

In this final chapter of this edited volume, we look back through the chapters to identify some of the themes that unify the research to date on the consequences of procrastination for health and well-being. More importantly, we also take a look ahead to what research might help address the gaps in the current literature on procrastination, health, and well-being, as well as the promising areas that might be fruitful to pursue to further our understanding of this important topic.

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LOOKING BACK: THREE KEY THEMES

The chapters in this volume highlight three central themes for understanding how procrastination relates to health and well-being. First, a number of chapters in this book have underscored the point that failure to regulate behavior is the underlying problem that results in procrastination and has consequences for health and well-being. Although this point may seem obvious given that procrastination is essentially a form of behavioral self-regulation failure, we begin by identifying this explicitly given that the ramifications of failing to regulate behavior, both in general and more specifically with respect to health, can be diverse and not always apparent at first. If we view procrastination, as many researchers do, as involving the voluntary delay of important intended tasks despite knowing that such delay will most probably result in negative consequences (a perspective summarized in the meta-analysis by Steel, 2007), then by definition (and default), not following through with one's intentions to eat healthy, engage in regular physical activity, or manage one's stress could be considered a form of health-related procrastination. Indeed, finding more focused ways to assess these specific forms of procrastination was the focus of Haghbin and Pychyl's work in Chapter 6, Measurement of Health-Related Procrastination: Development and Validation of the Exercise and Healthy Diet Procrastination Scales. Similarly, Kroese and colleagues' work in Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency further highlighted the importance of understanding and addressing bedtime procrastination as a specific form of health-related procrastination to maximize health and well-being.

Although procrastination on specific health behaviors may seem to be the most direct way in which procrastination can be a risk factor for the development of poor health, chronically procrastinating on other tasks unrelated to health can set the stage for the development of patterns of behaving and responding that can over time have more serious and long-term health consequences, as was noted by Sirois in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective. This point was highlighted nicely by Argiropoulou and colleagues in Chapter 7, Relation Between General Procrastination and Health Behaviors: What Can We Learn From Greek Students? who found that even young and relatively healthy students who procrastinate academically may also be at risk for developing a pattern of poor health behaviors, a pattern which may become quite stable given the developmental significance of emerging adulthood. This point cannot be overstated given the findings from a recent review of weight-related health behaviors in emerging adults (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). Using a longitudinal

design, Nelson and colleagues collected their data from a nationally representative sample, and their results revealed adverse changes in both diet and physical activity levels during this critical transition period that put this group at increased risk for poor long-term health outcomes. What makes matters worse is that when these young adults then enter the workplace, any behavioral tendencies toward procrastination may persist and impact work life and well-being, as noted by van Eerde in Chapter 11, Procrastination and Well-Being at Work.

As many chapters in this volume have highlighted, the self-regulation difficulties inherent with procrastination extend beyond issues of regulating behavior. Emotion-regulation issues are also inextricably involved in procrastination, and as we have argued elsewhere (Sirois & Pychyl, 2013), are central for understanding procrastination. This brings us to the second theme that unifies much of the work on procrastination, health, and well-being presented in this volume. Emotion regulation, including ineffective regulation of stress, is intimately linked to the behavior regulation issues of procrastination, and therefore contributes to the effects on health and well-being.

The centrality of emotion regulation in procrastination was cogently argued by Pychyl and Sirois in Chapter 8, Procrastination, Emotion Regulation, and Well-Being, where they highlighted why procrastination can be viewed as a mood-regulation strategy, creating a short-term, positive hedonic shift, with long-term costs, including negative effects on health and well-being. Switching from less pleasurable or aversive tasks to more pleasurable pursuits to regulate mood can also have a social cost compounding the negative effects of procrastination as a coping strategy. As Giguère and colleagues noted in Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination, when we procrastinate, we transgress sociocultural norms, which can result in feelings of shame that can have further negative cognitive and behavioral effects on health and well-being. Failure to regulate emotions can also be viewed as failing to regulate stress, as both may be part of the same overarching self-regulatory system which includes the fight-or-flight response as its default (Butler, 2011). As Sirois noted in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective, a pattern of poor stress management and coping, and thus heightened stress, can take a toll on physical well-being that may put procrastinators at risk for poor health outcomes, both in the short term and long term.

The third and final theme that emerges from the collection of work in this volume highlights the temporal aspects of procrastination for health and well-being. If we accept that procrastination is necessarily a temporally bound phenomena (Sirois & Pychyl, 2013), then it follows that this form

of self-regulation failure will have consequences for both immediate and future health and well-being. This theme takes center stage in Chapter 2, Recovering *Kairos*: Toward a Heideggerian Analysis of Procrastination; and Chapter 10, Temporal Views of Procrastination, Health, and Well-Being where the authors highlight in different ways how procrastination reflects a failure to move from a more abstract conception of the future and future self, to a more realistic view of idealized future moments and an empathetic view of the future self, respectively. Whether viewed from a philosophical lens by Crooks in Chapter 2, Recovering *Kairos*: Toward a Heideggerian Analysis of Procrastination, or through a psychological lens by Blouin-Hudon and colleagues in Chapter 10, Temporal Views of Procrastination, Health, and Well-Being, the disconnection with the future underscores the consequences of procrastination for health and well-being. Pychyl and Sirois's description of the temporal mood-regulation dynamics in Chapter 8, Procrastination, Emotion Regulation, and Well-Being further highlights this important aspect of procrastination that is necessary for understanding the emotional trade-offs that result in sacrificing future well-being for immediate hedonic boosts. This temporal bias in favor of the short-term needs of the present self over the future self also impacts physical health outcomes. As Sirois notes in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective, the consequences of poor emotion and stress regulation can have a trickle-down effect that constricts the temporal horizon of procrastinators and fosters temporal myopia, making it more likely that they will continue to ignore the potential long-term effects of both their procrastinating and their poor health behaviors.

Taken together, these three themes of self-regulation failure due primarily to a misregulation of emotion that biases the individual temporally to favor behaviors for the present self over those for the future self captures much of what we understand about procrastination to date. More importantly, these three themes help us understand why it is that procrastination undermines our health and well-being. This research and our understanding are far from complete, however, so we turn now to a discussion of where we might go next with our research.

LOOKING AHEAD: FOUR KEY ISSUES IN PROCRASTINATION, HEALTH, AND WELL-BEING RESEARCH

As noted in Chapter 1, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being, a number of theoretical and empirical advances in recent years have helped define the field in terms of

understanding how and why procrastination is implicated in health and well-being. This foundational and often pioneering work has set the stage for the next generation of research on this topic, and has underscored the gaps in our understanding that need to be addressed to further advance the field. Many of the chapters in this book have discussed these gaps, often in the context of highlighting promising areas to explore that remain unchartered in the landscape of research on procrastination, health, and well-being. In the next sections, we briefly summarize and discuss four key issues that warrant further attention to continue the growth and momentum that has to this point propelled this interesting area to the forefront of procrastination research. We also offer some recommendations for how these issues might be addressed to further advance research on the role of procrastination in health and well-being.

Issue 1: Conceptualizing Procrastination as Trait, State, or Coping Strategy

How we construe procrastination may have significant implications for health and well-being. As noted in several of the chapters, procrastination is often viewed as a relatively stable personality-like trait. Indeed, much of the research linking procrastination to health outcomes such as stress, health, behaviors, and physical health problems has taken a trait approach, arguing that as a relatively stable and perhaps chronic tendency, the health implications of procrastination may have more lasting effects (see Chapters 1, 4, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being; Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective). While this approach can certainly highlight the potential long-term effects of procrastination for health, it may overlook some of the more immediate effects that can occur when we view procrastination as a situationally bound phenomena. One advantage of viewing procrastination this way is that it acknowledges the role of context, not just the person, as well as the possibility of changing the behavior in the short term, before it may become more entrenched as a pattern of behavior that is difficult to change. This can be especially important when we are interested in understanding procrastination within specific health-related domains such as diet and exercise with an eye toward early intervention to reduce the potential public health burden that results from not following through with these behaviors. The situational view of procrastination can also afford a more social view of the phenomena and its consequences for social emotions as noted by Giguère and colleagues in Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination.

However, rather than recite a litany of the benefits and shortcomings of each approach, the key point to be made here is that it is crucial that we are clear about how we are conceptualizing procrastination when conducting research into the potential links to health and well-being. For example, the temporally extended procrastination-health model in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective provides a theoretical account of how and why there may be very important differences in health-related outcomes expected depending on whether procrastination is viewed as chronic or as situational. These differences are obscured if we blur the lines between trait and state procrastination. Being clear about this difference is also important when we consider some of the more serious potential consequences of trait procrastination which are unlikely to result from the occasional incident of procrastination (i.e., situational). Making this distinction clear when we discuss procrastination and its potential consequences is not only important theoretically, but also because doing so means taking responsibility for what information may make its way into the public domain, because procrastination is a topic that tends to attract a great deal of attention from the media. In this regard, it is common to hear people say that "everyone procrastinates" (i.e., situational procrastination), but not everyone is a "procrastinator" (i.e., trait procrastination). This distinction is important although confused in both the media and by researchers far too often.

Future theoretical work may also benefit from clarifying the nature of what are labeled lower-order traits in relation to the Big-Five "super traits." For example, in addition to the Big-Five *Model* of Personality, McCrae and Costa (2008) have articulated the Big-Five *Theory* of Personality. From this perspective, coping and procrastination would be considered "Characteristic Adaptations" of personality that are influenced by foundational traits such as Conscientiousness, but also influenced by "External Factors" through processes like social learning or the social effects of procrastination as outlined by Giguère and colleagues in Chapter 9, Delaying Things and Feeling Bad About It? A Norm-Based Approach to Procrastination. This conceptualization not only provides a more comprehensive developmental perspective, it also shows how procrastination as an emotion-focused coping strategy is malleable. Too often we get stuck in trait-state debates that characterizes prepotent behaviors as *either* "bred in the bone" sort of entities that are difficult, if not impossible, to change *or* behaviors triggered by the environment. The middle ground in a consideration of chronic procrastination may be better framed as a learned pattern of behavior that is influenced by our traits, but

which is certainly no more than our characteristic way of adapting to the world around us. This account of procrastination theoretically may be more fruitful than continuing the early research tradition of discussing it as a trait or state, and it is a more parsimonious account of procrastination in light of recent research that clearly situates it as a misregulatory strategy for coping with a focus on short-term mood repair (see Chapter 8, Procrastination, Emotion Regulation, and Well-Being). Finally, situating procrastination as a coping strategy, one of many of our characteristic adaptations, that is a result of both person and context factors, also acknowledges the importance of a theoretical approach that takes into account person and context as advocated by van Eerde in Chapter 11, Procrastination and Well-Being at Work.

Issue 2: The Need for Methodological Advances

One of the key methodological issues plaguing current research into the consequences of procrastination for health and well-being is the reliance on cross-sectional studies to examine what are proposed to be temporal causal relations. Although it is commendable that many of these studies have taken a theoretically driven approach and used more sophisticated statistical techniques such as structural equation modeling (Haghbin, McCaffrey, & Pychyl, 2012; Sirois, 2007; Sirois & Stout, 2011; Sirois & Tosti, 2012), the issue of temporal precedence remains. That is, these and similar studies rely on the assumption that procrastination is a relatively stable trait-like quality and as such is forward in the causal chain of variables. However, given our previous discussion of recasting procrastination as a less set and more malleable characteristic way of behaving, this assumption becomes less tenable and more problematic. Longitudinal research is one way to address this important issue.

There is currently a dearth of longitudinal studies examining both the relations of procrastination to health and well-being outcomes over time, as well as any potential changes in markers of health and well-being in relation to procrastination. Among the few studies which have taken a prospective approach to understanding how procrastination may relate to health and well-being, the results tend to support the claims made by cross-sectional research. For example, using a longitudinal, cross-panel model, Rice, Richardson, and Clark (2012) demonstrated that procrastination as measured with Lay's (1986) general procrastination scale was associated with higher subsequent levels of distress at each of three time points. In perhaps the only longitudinal test of the procrastination-health model (Sirois, Melia-Gordon, & Pychyl, 2003) to date, procrastination was

consistently associated with higher stress, fewer wellness behaviors, and a greater number of physical health problems in a large sample of undergraduate students at each of the three time points assessed (Sirois, Voth, & Pychyl, 2009). These promising results make it clear that the time and expense necessary for conducting longitudinal research are warranted and needed to improve our understanding of the effects of procrastination on health and well-being.

Other more methodologically rigorous studies with a more temporal focus, such as experience sampling and daily diary methods, are also necessary to move the field forward. Such studies are necessary to better understand the *processes* underlying procrastination and how these processes may contribute to the toll procrastination can take on health and well-being. To date, this more process-focused research is lacking. A notable exception is a study conducted by Pychyl, Lee, Thibodeau, and Blunt (2000) that examined the ongoing ebb and flow of procrastination and mood over a 5-day period in undergraduate students. Students were electronically paged eight times a day and asked to report their mood and concurrent procrastination behaviors. Although the results contradicted previous research by not showing the expected relation of a measure of procrastination to positive or negative affect, what they did reveal was that the relative pleasantness or difficulty of tasks tended to shift depending on whether the students were avoiding or engaged in the task. Avoided tasks were associated with negative appraisals (higher difficulty and lower enjoyment), whereas once students had begun working on these same previously avoided tasks, they were appraised significantly more positively (higher enjoyment and lower difficulty). This finding underscores the importance of using more dynamic methods for understanding the process of emotion regulation as it relates to procrastination, which inevitably ebbs and flows as people move from anticipating starting an aversive or challenging task to actually actively working toward completing it.

Furthermore, at a time when our scientific community is calling for the replication of basic research, it would be important to take a foundational study such as the work of Tice, Bratslavsky, and Baumeister (2001) summarized in Chapter 8, Procrastination, Emotion Regulation, and Well-Being, and not only replicate their laboratory-based work, but extend this to more naturalistic settings. An experience-sampling approach might allow us to examine how the mood-repair effects of procrastination that Tice et al. identified play out over time as people struggle with aversive tasks outside of the laboratory. Without this approach, we can never be sure that we are actually

studying procrastination in these experiments as opposed to a kind of delay or off-task behavior that is specific to contrived experimental conditions.

How we measure health and well-being outcomes is also crucial for advancing our understanding of the consequences of procrastination. Research in the area has relied almost exclusively on self-report measures of stress, health behaviors, and physical health outcomes. Although there is some evidence that certain measures of these outcomes converge reasonably well with more objective indices of health (Cohen, Kamarck, & Mermelstein, 1983; Jylhä, 2009), they are also influenced by subjective states such as mood which can amplify or reduce self-report scores. This is especially true in the case of self-reports of physical health which are well known to be biased by negative affective states (Watson & Pennebaker, 1989). In cases where self-reports are the only means of assessing physical health, it may be advisable to avoid symptom checklists, which are influenced strongly by negative affect and instead use health problem checklists, which tend to be unrelated to the sorts of reporting biases introduced by negative affect (Sirois et al., 2003). For example, asking someone if they have certain cold symptoms, such as a sore throat, feeling achy, sniffley, and sneezy, is likely to yield self-reports with a great deal of interindividual variability, even among people who have had the same number and severity of colds in the past 3 months. This is largely due to differences in the way that people attend to or ignore their physical symptoms as a function of mood states, environmental cues, and other factors (Taylor & Sirois, 2014). Asking participants instead whether they have had a cold in the past 3 months can reduce this variability and therefore may provide more accurate self-reports of illness.

Another alternative way of assessing physical health in the absence of access to medical records is simply to ask people to self-rate their overall health status. The single global health rating from the Medical Outcome Survey (MOS) short form (SF-36; Ware & Sherbourne, 1992) is a simple, widely-used and valid way of measuring health status. The straightforward question "In general, would you say that your health is excellent, very good, good, fair, or poor?" has demonstrated excellent criterion-related validity with objective measures of health status including observed health behaviors, cortisol responses to stress, morbidity, and mortality (Jylhä, 2009; Kristenson, Olsson, & Kucinskiene, 2005; Mora, Orsak, DiBonaventura, & Leventhal, 2013; Tamayo-Fonseca et al., 2013). With respect to procrastination, at least one study has used this measure to assess physical health with results consistent with theory and previous research; procrastination was associated with lower self-rated health (Sirois, 2007).

Research using more objective measures of health outcomes are nonetheless needed to help advance the field and move research on procrastination, health, and well-being to the next level. Physiological measures of stress such as salivary cortisol (a marker for activation of the HPA system and the neuroendocrine stress response) have been used in investigating how other related personality traits such as perfectionism are associated with health and well-being (Richardson, Rice, & Devine, 2014; Wirtz et al., 2007). Of particular note, cortisol response to stress was found to be linked to the emotion-regulation difficulties associated with maladaptive perfectionism in one study, with perfectionism uniquely explaining 18% of the variance in cortisol response after controlling for coping and other higher-order personality factors (Wirtz et al., 2007). Findings from a meta-analysis indicate that procrastination is positively associated with this form of perfectionism (Sirois, Molnar, & Hirsch, forthcoming). Accordingly, taking this objective approach to assessing both stress and emotional regulation could similarly yield important insights into the links between emotion regulation and physical health in procrastination.

Although there are a number of different ways to assess health and well-being using objective measures, one other method in particular is worth noting. Heart-rate variability (HRV) may be one important way of assessing both self-regulation strength/fatigue with respect to procrastination, as well as providing a marker of overall regulation of the stress response and the accompanying emotions. HRV is a measure of how well the parasympathetic nervous system controls the heart after acceleration due to activation of the stress response via the sympathetic nervous system. Higher HRV is therefore conceptualized as a physiological index of self-regulatory strength and effort (Segerstrom & Nes, 2007), as well as a marker for the overall capacity to regulate the stress response (Butler, 2011). Consistent with these views, there is also evidence suggesting that HRV may be reflective of healthy emotional regulation and therefore can serve as an objective measure of the capacity to generate emotional responses of appropriate timing and magnitude (Appelhans & Luecken, 2006). Taken together with research demonstrating that HRV is associated with well-being through its links to emotion regulation (Geisler, Vennewald, Kubiak, & Weber, 2010), these findings suggest that HRV may be a promising and appropriate way to objectively assess how procrastination relates to health and well-being.

A final noteworthy area for methodological improvement involves using more diverse and representative samples when we investigate the consequences of procrastination for health and well-being, especially given the

predominance of student samples in the research to date on this topic. Apart from research that is focused specifically on procrastination in student populations and how this might affect health-related outcomes (see Chapter 7, Relation Between General Procrastination and Health Behaviors: What Can We Learn From Greek Students?), arriving at a better understanding of not only the short-term effects but the long-term effects of procrastination necessarily means examining these effects in adult samples. Community adult samples are both older and generally more diverse in their preexisting health statuses and vulnerabilities than young adult, or emerging-adult, student populations. As noted in Chapter 1, Introduction: Conceptualizing the Relations of Procrastination to Health and Well-Being, the proposed relations between procrastination and health may be more robust when tested in adult samples (Sirois, 2007) than when tested in student samples (Sirois et al., 2003) due to the relatively more resilient health status of the emerging adults. Moving away from student samples and toward specialized samples such as those with ongoing health conditions is also important to understand how procrastination may be a liability for health in populations with preexisting vulnerabilities such as those living with a chronic illness, as Sirois highlighted in Chapter 4, Procrastination, Stress, and Chronic Health Conditions: A Temporal Perspective.

A diversity of samples must also take into account the paucity of data collected in the workplace noted by van Eerde in Chapter 11, Procrastination and Well-Being at Work. Notwithstanding the challenges inherent both in collecting these data and in understanding the diverse effects of the work context, it is essential that we not rely on research on student samples to understand the effects of procrastination on well-being in the workplace. In short, if we want to broaden our understanding of the how procrastination may influence health and well-being, then we need to investigate these effects with more diverse samples across more diverse contexts and with more diverse methods.

Issue 3: Expanding the Different Types of Delay We Examine

Moving toward a more complete understanding of when and how procrastination may compromise health and well-being may also require examining delay in more nuanced and focused ways. Certain domain-specific forms of procrastination may have more or less significance for health and well-being outcomes. For example, both health procrastination (see Chapter 6, Measurement of Health-Related Procrastination: Development and Validation of the Exercise and Healthy Diet Procrastination Scales) and bedtime

procrastination (see Chapter 5, Bedtime Procrastination: A Behavioral Perspective on Sleep Insufficiency) clearly can have significant implications for health-related outcomes. Establishing valid and reliable instruments to measure these domain-specific forms of procrastination is therefore essential. To this end, both Hagbhin and Pychyl, and Kroese and colleagues have developed the measures necessary for future investigations of procrastination within these domains.

What may be even more important for future research than specific types of procrastination will be to explore the effects of *other types of delay* on health and well-being. It is important to take to heart that while all procrastination is delay, not all delay is procrastination (Pychyl, 2013), and as Anderson made clear in Chapter 3, Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay, procrastination is that particular form of "culpably unwarranted delay." The question remains about how, if at all, other forms of delay affect our health and well-being. Recently, (Haghbin, 2015; Haghbin & Pychyl, 2015) proposed a typology of delay that includes the irrational and hedonistic forms of delay that we might categorize as procrastination, but also more purposeful or strategic delay, inevitable delay due to conflicting commitments, as well as delay due to emotional problems. While each type of delay is distinct in terms of what causes it, it remains an empirical question of how these forms of delay, purposeful or not, may affect us negatively. For example, although someone who persistently fails to exercise due to conflict with work or family commitments may not be guilty of procrastination, or culpable for unwarranted delay as discussed by Anderson, he or she may still suffer negative health effects. Delay of health behaviors, no matter the reason, is the harbinger of poor health. In addition, these distinctions between types of delay may be very important in understanding our subjective experience of delay and the rationalizing or reconstruals that Anderson argues is at the heart of our procrastination. Again, not exercising because one is "too busy" with other important things is still a problem, but we may not see it as such if our reconstruals license our continued delay. In short, by bringing together new research as summarized in these chapters, we have opened the door to important new questions for future research.

Issue 4: Interventions for Addressing Procrastination and its Consequences

The chapters in this volume have highlighted a number of important ways that procrastination may be a liability for health and well-being. And,

despite the recognition of the need for further research that we have discussed this far, what is also needed now are theoretically based interventions to help address the deficits and risks identified to date. Psychological counseling techniques, cognitive-behavioral therapy, and public health interventions delivered both at the level of primary care and at the population level may be necessary to minimize the consequences of procrastination for health and well-being. Given the central role of emotions, and stress in particular, in the health-related outcomes associated with procrastination, techniques for reducing stress would certainly be beneficial. For example, mindfulness-based stress reduction techniques could prove to be particularly effective given the known negative associations between procrastination and mindfulness (Sirois & Tosti, 2012). Less formally, encouraging engagement in mindfulness-promoting activities such as t'ai chi, yoga, and meditation may also be useful for both reducing stress and developing a less reactive and judgmental stance toward the negative emotions that can prompt procrastination. Along similar lines, self-compassion holds some promise as a potential intervention to help address the negative self-evaluations that can further create stress in instances of procrastination. For example, research has demonstrated that low self-compassion offers some explanation for why procrastination is linked to higher stress (Sirois, 2014). Several studies have now demonstrated that self-compassion interventions are relatively straightforward to deliver and may be effective for individuals high in shame and self-criticism (Gilbert & Procter, 2006; Neff & Germer, 2013). Similarly, self-forgiveness, a concept related to self-compassion, has been shown to decrease future procrastination (Wohl, Pychyl, & Bennett, 2010). Future intervention research could examine the effects of increasing self-compassion or related constructs such as self-forgiveness to not only reduce the stress and self-blame associated with procrastination, but perhaps also the behavior itself.

Most recently, psychologists in private practice (Scent & Boes, 2014), as well as researchers (Glick & Orsillo, 2015), have begun to explore how acceptance and commitment therapy can be applied to procrastination interventions. They argue, along the lines of the existential-humanistic perspective advocated by Crooks (see Chapter 2, Recovering *Kairos*: Toward a Heideggerian Analysis of Procrastination), that psychological problems stem from experiential avoidance and cognitive fusion—that is, taking thoughts literally. Similar to a mindfulness approach, intervention focuses on helping clients develop nonjudgmental acceptance of present-moment thoughts and feelings. These skills are the basis for increasing psychological flexibility

or the ability to act on one's values or intentions despite experiencing unwanted thoughts or feelings associated with the task or project at hand. Rather than changing thoughts or feelings, the focus is on using techniques such as experiential exercises or mindfulness to get past the language traps that lead to cognitive fusion and avoidance. To date, studies such as those by Scent and Boes (2014) and Glick and Orsillo (2015), as well as Gagnon, Paquette, Dionne, and Pychyl (2015), reveal promise in terms of developing the personal agency necessary to overcome the breakdown in volitional action that is procrastination.

Of course, any discussion of areas for further research and testing of potential intervention techniques would be remiss if it did not to look beyond those that focus solely on the individual and his or her capacities, to the environment which may offer scaffolding affordances to help the individual engage in desired behaviors. Anderson's discussion of the notion of "extended will" (see Chapter 3, Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay) is an important example of how we need to think outside of the individual's willpower to the person in context. To the extent that we can use the environment strategically to support our all too limited self-regulatory resources, this approach offers promise for another route to successful intervention. As Anderson argues in his discussion of this approach, we can learn to structure our environment in such a way as to scaffold the intentions made by our "better self" in order to support our "weaker self" when faced with temptations to needlessly delay. Much further research is needed to address this intersection of person in situation as highlighted by van Eerde's model in Chapter 11, Procrastination and Well-Being at Work.

CONCLUDING THOUGHTS

Lack of exercise, insufficient sleep, an unhealthy diet, and stress have all been implicated in the development and exacerbation of a host of major chronic health problems (World Health Organization, 2011). These chronic health conditions take a substantial toll on our quality of life and well-being, and in some instances even lead to early mortality. Given that our behavioral patterns, including how we cope with stress, are one of the few determinants of health over which we can exercise control, we believe that the health of the developed world depends almost entirely on helping people develop the self-regulatory skills and personal agency required to live healthy, meaningful, and satisfying lives.

Of course, it is somewhat ironic that each of the causal factors listed earlier—exercise, sleep, diet, and stress—depends largely on our choices. We are culpable, as Anderson (see Chapter 3, Structured Nonprocrastination: Scaffolding Efforts to Resist the Temptation to Reconstrue Unwarranted Delay) has argued, in our own demise. Although few things are completely in our control, our health behaviors are still largely a matter of our intentions and volition. The gap between our intentions and action, procrastination, has been the focus of this book, and we hope that this exploration of the relation of procrastination, health, and well-being has both provided insight into why our volitional action breaks down, as well as what we yet need to understand about why we become our own worst enemy.

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