NORTHWESTERN UNIVERSITY

Dream Big:

Future Identities, Perceived Value, and Self-control

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

for the degree

DOCTOR OF PHILOSOPHY

Field of Human Development and Social Policy

By

Ryan Christopher Svoboda

EVANSTON, ILLINOIS

June 2019

© Copyright by Ryan Svoboda 2019 All Rights Reserved

Abstract

Students pursue educational and career future identities (e.g., graduating college, becoming an engineer, etc.) that are tied to their deepest wants, desires, and needs, yet many find it difficult to exert self-control and resist temptations while pursuing these identities (e.g., studying versus watching TV, paying attention in class versus scrolling social media, etc.). My dissertation seeks to understand why students' struggle at self-control by first proposing a unique antecedent (i.e., future identities) and mechanism (i.e., perceived value) of self-control that represents a distinct shift from past models (e.g., ego depletion, dual-systems, etc.). In the end, I demonstrate important implications for social psychological interventions, classroom practices, and broader policies and programs targeting achievement.

In Chapter 1, I propose the Activation, Motivation, and Pursuit (AMP) Process for Self-Control. This process is the first to posit four specific hypotheses regarding the relationship between future identities, perceived value, and self-control. Specifically, it is expected that future identities that are activated (i.e., activation: future identity is on-the-mind), followed for want-to (i.e., motivation: interest and identification with future identity), and pursued with a high amount of resources, time, and effort (pursuit) will increase the level of perceived value placed on the goal-directed behavior in a self-control dilemma and lead to a higher likelihood that self-control occurs. Overall, this process calls for more comprehensive social psychological interventions as well as the consideration of future identities in policies and programs more broadly.

In Chapter 2, I assessed the associations between students' motivation and pursuit for their career future identities and career success (career goal progress, career satisfaction, employment, and income) from graduation to one year later. Results showed that both motivation and pursuit predicted students' career goal progress and career satisfaction one year later but only students' pursuit predicted their likelihood of employment one year later. This finding has implications for how colleges and universities can prepare their students for the workforce. In addition, the associations between motivation (and pursuit) and career success ignited the development of the AMP process proposed in Chapter 1 because I wanted to understand the proximal processes (i.e., self-control) through which motivation and pursuit predicted career success.

In Chapter 3, I evaluated the motivation pathway in AMP using an experimental paradigm and a novel measurement of self-control. In this study, a sample of college pre-medical students were randomly assigned to write about their want-to reasons for becoming a doctor, their have-to reasons, or neither. Afterwards, their self-control was measured during a Medical College Admissions Test (MCAT) study session (i.e., choice between solving practice MCAT questions or interacting with popular online content) and their performance on the study session and a subsequent MCAT quiz was recorded. Perceived value was measured before the study session and quiz. Results found no differences by condition on perceived value, self-control, or achievement; however, issues with the experimental manipulation and measurement of dependent variable limit the inferences that can be drawn from these results. Overall, this has important implications for future self-control research as well as how one conceptualizes AMP moving forward.

Acknowledgements

I am thankful to my family, friends, and colleagues who have helped me in countless ways throughout my graduate school career. First, I would like to thank my dissertation committee: Mesmin Destin, Claudia Haase, and Dan McAdams. Your feedback and perspectives challenged me throughout the process and improved the studies greatly. In addition, Mesmin's unwavering support, push for theoretical specificity, and willingness to have me take the lead on school projects was instrumental to the success I experienced throughout graduate school. Claudia's constant encouragement, reminders to consider developmental influences, and reassurance to pursue my ideas gave me the courage and ability to follow research I was passionate in.

The Lifespan Development Lab was a foundation of support throughout my graduate school career. I would like to thank the LDL members—Emily Hittner, Jacquelyn Stephens, DJ Rompilla, Claire Yee, and all other current and past RAs—for their helpful comments and all the time I wasted in 111. Jason Levin's and Lorenz Minder's help on Chapter 3 made this dissertation possible. The Destin Lab was an outlet for feedback too many times to count. I would like to thank Regine Debrosse, Ivan Hernandez, Lynn Meissner, Claudia Castillo, and the RAs. Even though we just started them, I'll miss our Thursday afternoon's at Mesmin's house (and the free lunch). I also want to thank my co-authors—Christopher Rozek, Alex Browman, Judith Harackiewicz, Janet Hyde, Jutta Heckhausen, and Rainer Silbereisen—for their smart feedback and hard work. I would not have been able to pursue my research without the funding provided by the Institute of Education Sciences and Multidisciplinary Program in Education Sciences. And my research would be nothing without the principals, teachers, students, and participants who made it all possible. My Northwestern colleagues were there with me every step of the way. First, thanks to my cohort—Richard Paquin Morel, Carolyn Pichert Swen, and Elizabeth Debraggio. I still miss our fun times in 106. Olivia Healy and Emily Hittner are the best "co-workers" anyone could ask for. I will miss our EOR hangouts. While at University of Wisconsin-Madison, Christopher Rozek was integral to my decision to pursue graduate school. I would like to thank Chris for his encouragement and mentorship then and his friendship and support now. I also want to thank Thomas Grossinger and Charles Krause. Although were dancing on our own now, those days at 852 made graduate school so much easier.

Most importantly, I'd like to thank my family. I am incredibly lucky to call Alice and Chris Svoboda my parents. They have supported me wholeheartedly throughout my life and especially throughout this crazy journey. I would not have made it through graduate school without their support. My brothers, Eric and Adam Svoboda, who are the most caring people I know and the best older brothers one could ask for. Moe Damm, you are the love of my life and my best friend. Thank you for your patience during this wacky process and your constant encouragement to follow my dreams. Go pack go.

Dedication

To my parents for their constant generosity, Moe for her never-ending support, big guy, and my grandparents.

Table of Contents

Abstract	
Acknowledgements	5
Dedication	7
List of Figures, Tables, and Appendices	11
Introduction	
Chapter 1: The Activation, Motivation, and Pursuit (AMP) Process for Self-Contr Future Identity, Perceived Value, and Self-Control	ol: 20
Overview of the Activation, Motivation, and Pursuit (AMP) Process for Self-control.	
Historical Context of the Activation, Motivation, and Pursuit (AMP) Process for Self	-control 26
Definitions of Key Constructs in AMP	
Self-Control	
Future Identity	
Perceived Values	
Theoretical Predictions from AMP	41
The Activation Pathway	41
The Motivation Pathway	
The Pursuit Pathway	
Discussion	
Why these future identity inputs matter?	
What other future identity inputs matter?	55
Is perceived value the only mechanism?	
How to test AMP?	
What dispositional and contextual factors matter?	
Intervention Recommendations	59
Beyond social psychological interventions	
Conclusion	63
Chapter 2: Motivation, Pursuit, and Success during the Transition from University Work	y to 64
Introduction	

The Dela of Mativations Concer Coal Self Concerdance and Success	9
The Role of Motivation: Career Goal Self-Concordance and Success	
The Role of Pursuit: Career Goal Engagement and Success	
Self-Concordance and Goal Engagement	
The Present Chapter	
Method	
Participants	
Procedure	
Measures	
Analysis Plan	
Results	
Preliminary Analyses	
Self-Concordance and Career Success	
Goal Engagement and Career Success	
Goal Engagement and Self-Concordance	77
Supplementary Analyses	
Discussion	
Motivation and Pursuit: Both Matter for Career Success	
Pursuit over Motivation?	
Strengths and Limitations	
Implications for Future Research and Applications	
Conclusion	
Chapter 3: Want-to Versus Have-to Motivation and Self-Control in a Learn	ning Context . 89
Introduction	
Present Chapter	
Methods	
Participants	
Procedure	
Measures	
Analysis Plan	
Results	
Confirmatory Analyses	
Exploratory Analyses	

10
106
106
111
115
115
119
124
130

List of Figures, Tables, and Appendices

Chapter 1 Figures
Figure 1 – 1. The activation, motivation, and pursuit (AMP) process for self-control 119
Chapter 2 Figures
Figure 2 – 1: Summary of cross-lagged models between either self-concordance (Figure 2 – 1a) or goal engagement (Figure 2 – 1b) and career success
Figure 2 – 2: Summary of cross-lagged models between self-concordance and goal engagement
Chapter 3 Figures
Figure 3 – 1: Self-reported obstacles as a function of experimental condition
Chapter 1 Tables
Table 1 – 1. Core and related theoretical support for AMP 124
Chapter 2 Tables
Table 2 – 1. Range of summary statistics and zero-order correlations across waves
Chapter 3 Tables
Table 3 – 1. Summary statistics overall and by condition
Table 3 – 2. Zero-order correlations between key study variables
Chapter 2 Appendices
Appendix A2 – 1. Test of model fit between unconstrained versus constrained cross-lagged models
Appendix A2 – 2. Full regression results from cross-lagged model between self-concordance, career goal progress, and covariates
Appendix A2 – 3. Full regression results from cross-lagged model between self-concordance, career satisfaction, and covariates
Appendix A2 – 4. Logistic and linear regression results for employment (or income) at T4 as function of self-concordance (or goal engagement) at T1 and covariates
Appendix A2 – 5. Full regression results from cross-lagged model between career goal engagement, career goal progress, and covariates
Appendix A2 – 6. Full regression results from cross-lagged model between goal engagement, career satisfaction, and covariates
Appendix A2 – 7. Full regression results from cross-lagged model between self-concordance, goal engagement, and covariates
Chapter 3 Appendices

12
Appendix $A3 - 1$. Sample responses to experimental conditions and study session example 178
Appendix A3 – 2. Full regression results for outcomes as a function of experimental condition and covariates
Appendix A3 – 3. Full structural equation modeling results for confirmatory analyses 186
Appendix $A3 - 4$. Outcomes as a function of experimental condition by parental education 194
Appendix A3 – 5. Full regression results for outcomes as a function of experimental condition by parental education
Appendix $A3 - 6$. Full regression results for outcomes as a function of treatment fidelity 200
Appendix A3 – 7. Summary statistics of LIWC codes overall and by want-to versus have-to condition
Appendix A3 – 8. Full regression results for LIWC coding as a function of want-to versus have-to condition
Appendix A3 – 9. Full structural equation modeling results for LIWC analyses

Introduction

A student faces numerous temptations every day that can limit their studying or classroom engagement, and if they accumulate, they can interfere with their long-term academic progress. Examples include hanging out with friends, going to the movies, texting friends, scrolling through social media, or watching TV. These instances represent self-control dilemmas when they occur in competition with goal-directed behaviors (e.g., the choice between a studying versus a watching TV, paying attention in class versus scrolling social media, going to a study group versus the movies, etc.), and past research on trait self-control finds that it is a key psychosocial resource that predicts higher levels of income, achievement, and well-being (Moffitt et al., 2011; Tangney, Baumeister, & Boone, 2004). Despite its predictive qualities, the process through which self-control operates remains open (Carter, Kofler, Forster, & McCullough, 2015; Friese, Loschelder, Gieseler, Frankenbach, & Inzlicht, 2018; Lurquin & Miyake, 2017), and this lingering question has implications for both research and real-world application. My dissertation seeks to understand this question from a novel theoretical perspective and tests it in real-world settings using both longitudinal and experimental designs.

The reasons why students fail to exhibit self-control are numerous and span contextual (e.g., neighborhood, financial, family life, etc.) and individual (e.g., attitudes, cognition, beliefs, effort, etc.) factors. For example, a high school student from a lower socioeconomic status (SES) background may find it hard to study for an upcoming mathematics exam compared to watching her favorite show on TV because she is aware that her financial situation limits her ability to enroll in a 4-year college and, ultimately, reach her goal of becoming an engineer. On the other hand, a student from a higher SES neighborhood may choose to scroll social media versus pay attention in class, not because of her financial situation, but rather because she places more value

on social media compared to paying attention. My dissertation investigates perceived value as unique mechanism for self-control such that self-control dilemmas are decided by the amount of perceived value the individual finds for the goal-directed behavior compared to the tempting one (Berkman, Kahn, & Livingston, 2016). In addition, I examine future identities, or long-term, identity-tied goals, as sources of perceived value in self-control decisions (Oyserman & Destin, 2010). This combination represents a unique approach to understanding the process of selfcontrol.

In Chapter 1, I propose the Activation, Motivation, and Pursuit (AMP) Process for Self-Control (Svoboda, Destin, & Haase, revise and resubmit) which outlines the relationship between three components of future identities (activation, motivation, and pursuit), perceived value, and self-control. Activation refers to a future identity, such as wanting to become an engineer, being on the mind of a student when she is confronted with a self-control dilemma, such as going to a study group or watching a movie (Oyserman & Destin, 2010). Moreover, contextual factors, such as the immediate setting and sociodemographic groups, shape what future identity is activated, and this has consequences for whether the student experiences a selfcontrol dilemma or not. Meanwhile, want-to motivation refers to the student wanting to become an engineer because she is interested in it or identifies strongly with it (Sheldon & Elliot, 1999). Have-to motivation, on the other hand, refers to the student having to pursue becoming an engineer because her parents are making her or she would feel anxious and guilty if she did not. Last, pursuit refers to the student investing time, resources, and effort towards becoming an engineer (J. Heckhausen, Wrosch, & Schulz, 2010). Past research finds positive associations between activation (Svoboda, Rozek, Hyde, Harackiewicz, & Destin, 2016), want-to motivation (Sheldon & Elliot, 1999), or pursuit (Haase, Heckhausen, & Köller, 2008) and achievementrelated outcomes providing evidence that they are important predictors self-control as well. This dissertation applies AMP to only the achievement and career domains, yet AMP can be applied to any achievement domains (e.g., relationship, health, etc.).

To generate theoretically-specific and empirically-testable hypotheses between future identities, perceived value, and self-control, AMP matches each future identity component with perceived values from Eccles' expectancy-value theory (attainment value, intrinsic value, utility value, and effort cost) (Eccles, 2009). These perceived values are predictive of achievementrelated choices in the academic domain, such as course-taking, effort, and performance (e.g., Simpkins, Davis-Kean, & Eccles, 2006; Simpkins, Fredricks, & Eccles, 2012). Altogether, AMP hypothesizes that a student whose career future identity is activated and pursued for want-to reasons and with a high investment of resources, time, and effort will exert self-control because she will perceived higher amounts of value (measured by attainment value, intrinsic value, utility value, and effort cost) for the goal-directed behavior, such as studying or doing extra credit homework, compared to the tempting behavior, such as watching TV or texting friends.

Numerous theoretical and applied implications flow from AMP. First, AMP is different than past models of self-control that promote, although inadvertently, a deficit model where selfcontrol fails to occur due to the individual's ability or capacity (Baumeister, Vohs, & Tice, 2007; Hofmann, Friese, & Strack, 2009). Because future identity activation is shaped by one's immediate setting, sociodemographic groups, and broader culture, AMP moves contextual factors to the forefront of self-control decisions. In addition, AMP calls for comprehensive social psychological interventions (Walton & Wilson, 2018) that target activation, motivation, and pursuit simultaneously compared to past ones that target only one of these constructs. This recommendation also applies to broader policies and programs or classroom practices. It is important to consider how components of AMP relate to broader structural changes instead of simply individual-focused social psychological interventions. For example, states could redesign curriculums to promote the salience of future identities and their accompanying motivation and pursuit. Similarly, programs targeting achievement, such as two-generation programs (Chase-Lansdale & Brooks-Gunn, 2014), could benefit from integrating group exercises that emphasizes these three components into their existing content.

Chapter 2 sparked the development of the AMP process outlined in Chapter 1 by examining motivation and pursuit for a career future identity as predictors of career success in a sample of German university students making the transition from university to work (Svoboda, Heckhausen, Silbereisen, & Haase, under review). Across the one-year, 4-wave longitudinal study, I find that both motivation and pursuit at graduation predict career goal progress and career satisfaction one year later; however, only pursuit predicts employment one year later. In addition, I assess the relationship between motivation and pursuit and, counterintuitively, find that pursuit predicts motivation longitudinally but not vice versa. These findings led me to theorize the AMP process for self-control because I wanted to understand how motivation and pursuit led to career success through self-control. After all, students must inhibit temptations during goal pursuit to ultimately achieve success towards what they want to do after graduation and, therefore, self-control represents a key mechanism through which motivation and pursuit impact achievement.

In addition to developing AMP, this study has implications for an understudied developmental period that plays an important role in a student's life (Schoon & Silbereisen, 2009). Specifically, colleges and universities could assist students in their transition to work by crafting career counseling programs that target both students' motivation and pursuit for their career future identity so that students are not only passionate about what they hope to do after school but also invest the necessary time, resources, and effort to get there. At the same time, this study has implications for motivational theory because it finds that the amount of effort a student puts towards their future identity predicts increases in how motivated they are for it, and this finding runs contrary to many prominent motivational theories (e.g., Dweck & Elliott, 1988; Eccles & Wigfield, 2002). Future research should investigate whether pursuit predicts motivation in other domains and with other populations.

Chapter 3 provides a causal test of the motivation pathway in AMP, measures perceived value as a mediator, and uses a novel measure of self-control. Specifically, Chapter 3 randomly assigns college pre-medical students to write about either their want-to reasons for becoming a doctor, have-to reasons for becoming a doctor, or past days' events (control) and measures their perceived value, self-control and achievement during an MCAT learning scenario. Pre-medical students were assessed because they possess similar career future identities (i.e., becoming a doctor). Results find no statistically significant differences on perceived value, self-control, or achievement.

These findings suggest two implications for AMP. First, a stronger manipulation may be needed so that students focus solely on one set of reasons. Follow-up analyses found many students did not write exclusively about want-to or have-to reasons. At the same time, these results suggest, especially in conjunction with Chapter 2, that motivation may operate on a trait or developmental level. That is, motivation for becoming a doctor may be hardened because of past experiences, personality traits, or broader culture and only malleable earlier in life or during key developmental transitions (McAdams & Olson, 2010). Students immersed in college pre-medical courses may need to sustain their motivation because they are in active goal pursuit and

need to ensure they experience success towards becoming a doctor. At the same time, considering the experimental manipulation or measurement issues, more research examining the experimental effects of motivation on self-control is needed before determining whether motivation operates on a trait or developmental level. Chapter 3 also improves on past self-control measurements, such as self-report, working memory, and persistence measures, that do not accurately capture self-control (Friese et al., 2018; Lurquin & Miyake, 2017). In addition, results did find that the want-to condition led individuals to report less perceived obstacles towards becoming a doctor compared to the have-to or control condition, and this finding matches past research on motivation, perceived obstacles, and self-control (Leduc-Cummings, Milyavskaya, & Peetz, 2017; Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016). Future research should continue to investigate the relationship between these constructs.

Although more internally- and externally-valid research is needed to validate AMP, Chapter 2 (i.e., motivation and pursuit predict career success) and 3 (i.e., want-to condition decreases perceived obstacles) find statistically significant effects that support AMP, and as mentioned earlier, AMP has implications not only for social psychological interventions but also broader policies and programs and every day school practices. For example, a teacher seeking to improve students' classroom engagement may benefit from targeting students' activation, motivation, and pursuit for career future identities in concert. This could occur by embedding writing exercises within classroom activities that help students think about what career they want, why they want that career, and how they persevere to get there. This combined effort may help students find the value for their schoolwork, reduce the likelihood they succumb to temptations, like scrolling social media or texting with their friends, and increase their classroom engagement. Moreover, interventions rooted in AMP increase the likelihood of success by targeting all three facets instead of one. After all, some students, for example, may lack the motivation for their future career (i.e., feel pressured by their parents to pursuit it) but still desire to place a high level of investment towards it, and, thus, respond positively to the pursuit component and not the motivation one. An intervention targeting only motivation would likely not be beneficial for these students.

In sum, the present three studies represent foundational research towards a new understanding of self-control that has important consequences for interventions, policies, and programs.

Chapter 1: The Activation, Motivation, and Pursuit (AMP) Process for Self-Control: Future Identity, Perceived Value, and Self-Control

A student who consistently chooses the goal-directed behavior, such as studying, paying attention in class, or going to a study group, over a tempting behavior, such as watching TV, going to the movies, or hanging with friends, exhibits self-control that is linked with positive outcomes, including increased academic achievement (Tangney et al., 2004), higher income (Moffitt et al., 2011), and better health and well-being (Moffitt et al., 2011; Tangney et al., 2004). For years, the popular explanation for why a student who chooses the goal-directed behavior over the tempting one was due to the amount of resources they can exert towards inhibiting the temptation and pursing the goal-directed behavior (Baumeister, 2014; Baumeister et al., 2007). However, the popularity of the ego depletion model of self-control (Baumeister, 2014; Baumeister et al., 2007) has diminished in recent years due meta-analyses (e.g., Carter et al., 2015) and a multilab preregistered replication (Hagger et al., 2016) that find either a null or small effect for ego depletion (Friese et al., 2018). In addition, fresh theoretical critiques (Friese et al., 2018; Inzlicht & Schmeichel, 2012; Lurquin & Miyake, 2017) underscore significant theoretical (e.g., mechanism is hard to measure) and methodological (e.g., self-control measures do not represent self-control) issues with the ego depletion model.

Because of this, new conceptualizations of self-control have emerged (Berkman, Hutcherson, Livingston, Kahn, & Inzlicht, 2017; Berkman et al., 2016; Berkman, Livingston, & Kahn, 2017a; Clarkson, Hirt, Jia, & Alexander, 2010; De Witt Huberts, Evers, & De Ridder, 201; Fujita, 2011; Inzlicht & Schmeichel, 2012; Jia, Yu, Hirt, & Fishbach, 2016; Job, Dweck, & Walton, 2010; Khan & Dhar, 2006; Kotabe & Hofmann, 2015; Kurzban, Duckworth, Kable, & Myers, 2013; Milyavskaya & Inzlicht, 2016; Molden, Hui, Scholer, & Scholer, 2016; Moller, Deci, & Ryan, 2006). These new models harken back to prior research, such as temporal discounting (Green, Fristoe, & Myerson, 1994) and delay of gratification (Mischel, Shoda, & Rodriguez, 1989), and underscore two key points: (1) perceived motivations (e.g., perceived value, effort, or depletion, etc.) drive self-control and (2) countless inputs (e.g., identity, incentives, social pressure, settings, etc.) can increase or decrease these motivations and, ultimately, self-control.

The present chapter centers on perceived value as a key mechanism to explain selfcontrol because past research finds it a powerful predictor of achievement-related choices (Atkinson, 1964; Eccles, 2009; Festinger, 1962; Simpkins et al., 2006; Simpkins et al., 2012) and other theoretical accounts of self-control suggest it may represent the most direct antecedent of self-control (Berkman, Livingston, & Kahn, 2017b; c.f., Molden et al., 2016). Specifically, value-based models of self-control (Berkman et al., 2016; Berkman, Livingston, et al., 2017a; Milyavskaya & Inzlicht, 2016) theorize that self-control occurs when the students find more value for the goal-directed behavior (e.g., paying attention in class) compared to the tempting one (e.g., scrolling social media) leading the student to choose the goal-directed one. Importantly, the present chapter builds from prior value-based models of self-control (Berkman et al., 2016; Berkman, Livingston, et al., 2017a; Milyavskaya & Inzlicht, 2016) in two key ways. First, the present chapter specifies what perceived values matter for self-control dilemmas. Second, it also links these specific perceived values with distinct inputs to posit theoretical predictions regarding when and how perceived value influences self-control. Ultimately, the present chapter can begin to answer questions such as: What factors influence a student's perceived value during a self-control dilemma and what types of perceived values matter for these self-control dilemmas?

To address these questions, I articulate a detailed process for self-control—called the Activation, Motivation, and Pursuit (AMP) process (Figure 1 - 1, Table 1 - 1)—that extends the value-based model of self-control (Berkman, Hutcherson, et al., 2017; Berkman et al., 2016; Berkman, Livingston, et al., 2017a). AMP hypothesizes three specific pathways regarding the relationship between future identity, perceived value, and self-control. AMP uses future identity as an input for self-control because past empirical research finds future identities and related constructs as motivators of behavior (Destin & Oyserman, 2010; Emmons, 1986; Heckhausen et al., 2010; Kasser & Ryan, 1996; Little, 1983; Markus & Wurf, 1987; Markus & Nurius, 1986; Oyserman, Elmore, & Smith, 2012; Vallacher & Wegner, 1987; Wicklund & Gollwitzer, 2013).

The goal of AMP is twofold. First, AMP posits four specific empirically-testable hypotheses about the relationship between future identity, perceived value, and self-control to illuminate an innovative and detailed process by which future identity impacts self-control through perceived value. Second, from these hypotheses, AMP calls for comprehensive socialpsychological interventions that target aspects of identity, motivation, and pursuit simultaneously to improve self-control, goal pursuit, and achievement and provides recommendations for how policies and programs may benefit from considering future identities. In this dissertation, I apply AMP to achievement and career domains; however, AMP applies to any achievement domain (e.g., health, relationships, fitness, etc.).

To start, I provide a brief overview of AMP, including the broader historical context it lies in, and then define key constructs. Next, I discuss each pathway in detail and connect the hypotheses to past research. Last, I discuss outstanding questions and deliver recommendations.

Overview of the Activation, Motivation, and Pursuit (AMP) Process for Self-control

AMP (Figure 1 - 1, Table 1 - 1) outlines the relationship between three future identity inputs (activation, motivation, and pursuit), four perceived values for the goal-directed behavior (attainment value, intrinsic value, utility value, and effort cost), and self-control. The first future identity input is activation which refers to whether the future identity is salient, or on-the-mind, of the student or not. The second input is want-to versus have-to motivation. Want-to motivation refers to whether students pursue their future identity more because they are interested in it or identify with it. Meanwhile, have to motivation refers to whether students pursue their future identity because feel pressured by others or would feel guilty or anxious if they did not pursue it. The last input is pursuit which refers to whether students exert effort, time, and resources towards their future identity. There are numerous other future identity inputs (e.g., approach- or avoidance-oriented future identity, feasibility of future identity, etc.) as well as other inputs (e.g., incentives, social pressure, etc.) that impact self-control, yet AMP focuses on these three inputs because past research suggests they are malleable to outside intervention (Chen, Chavez, Ong, & Gunderson, 2017; Destin & Oyserman, 2010; Galla & Duckworth, 2015; Gollwitzer & Sheeran, 2006; Koestner, Lekes, Powers, & Chicoine, 2002; Moller et al., 2006; Oyserman, Bybee, & Terry, 2006; Sheldon & Elliot, 1999; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005) and may connect to perceived value for behaviors (Svoboda et al., 2016; Vansteenkiste et al., 2005).

Next, to elucidate the mechanism underneath the relationship between future identity and self-control, AMP borrows from Eccles' expectancy-value theory of achievement motivation (Eccles, 2009) and includes four specific perceived values. Utilizing these specific measures of perceived value allows for more precise hypotheses that can be easily tested through empirical research. First, utility value refers to finding relevance or usefulness in the behavior. Second,

attainment value refers to identification with or the importance attached to the behavior. Third, intrinsic value refers to interest in or enjoyment from the behavior. Fourth, effort cost refers to the amount of time and effort required by the behavior. Empirical findings from expectancy-value theory (e.g., Flake, Barron, Hulleman, McCoach, & Welsh, 2015; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Simpkins et al., 2006, 2012) find these values predict achievement-related behaviors primarily in school (e.g., grades, course-taking, studying, etc.). An important note: AMP does not make predictions regarding the perceived value for the tempting behavior but includes the tempting behavior because, as others have noted, it is essential to the self-control decision (Fishbach & Shen, 2014; Hofmann, Baumeister, Förster, & Vohs, 2012; Hofmann & Van Dillen, 2012).

Figure 1 – 1 outlines the three hypotheses central to AMP using an example from the education domain. Each hypothesis is described further and connected to past research in subsequent sections. Table 1 – 1 provides an overview of theoretical support for AMP. The first hypothesis represented is the relationship between the activation of the future identity and utility value for goal-directed behavior. If the student's career future identity of becoming an engineer is salient, or on her mind, she will find utility value for studying (i.e., she finds studying relevant) since studying helps her become an engineer. However, if becoming an engineer is not activated, the student will not find utility value for studying since she will be less likely to see a connection between studying and her career future identity of becoming an engineer. Moreover, in AMP, the activation of any future identity is shaped by the broader contextual factors, including but not limited to the setting (e.g., school, apartment, etc.), culture (e.g., independent vs. interdependent), and social groups (e.g., gender, race/ethnicity, socioeconomic status, etc.) (Oyserman & Destin, 2010).

The second hypothesis in Figure 1 – 1 underscores the relationship between the motivation for a future identity and attainment and intrinsic value for goal-directed behavior. If the student is pursuing her career future identity of becoming an engineer for want-to reasons (e.g., because she is interested in becoming an engineer), she will place attainment and/or intrinsic value on the studying (i.e., she is interested in and/or identifies with studying) since she is passionate about becoming an engineer and is more likely to enjoy and find important the behaviors that help her achieve this identity. However, if she pursues becoming an engineer for have-to reasons (e.g., because she feels pressured to become an engineer), she will not place attainment or intrinsic value on studying because she is less likely to find the behavior interesting or important since she is not passionate about becoming an engineer is on her mind and relevant to studying.

The last hypothesis emphasizes the relationship between the pursuit of a future identity and effort cost for the goal-directed behavior. If the student invests high levels of time, effort, and resources towards becoming an engineer, she will place less effort cost on studying (i.e., see studying as less time-consuming and effortful) since she is already invested in becoming an engineer. However, if she does not invest time, effort, and resources towards becoming an engineer, she will not place less effort cost on studying since she is not invested in becoming an engineer.

In sum, the student will exhibit self-control when the overall perceived value for the goaldirected behavior (i.e., studying, paying attention in class, doing extra credit, etc.) outweighs the perceived value for the competing tempting behavior (i.e., watching TV, hanging out with friends, scrolling social media, etc.). On the other hand, the student will not exhibit self-control if the perceived value for the tempting behavior outweighs the perceived value for the goaldirected behavior. The activation and motivation pathway increase the perceived value for the goal-directed behavior (e.g., utility value and attainment/intrinsic value increase). Meanwhile, the pursuit pathway reduces a negative source of perceived value for the goal-directed behavior (i.e., effort cost decreases).

Historical Context of the Activation, Motivation, and Pursuit (AMP) Process for Selfcontrol

Historically, the study of self-regulation dates to James (2013) and his conception of habit and will. From there, several strains of related but distinct research investigated selfregulation through delay of gratification (Mischel et al., 1989), goals and standards (Carver & Scheier, 1982; Kruglanski et al., 2002), effortful control (Eisenberg, Smith, Sadovsky, & Spinrad, 2004), ego depletion (Baumeister, 2007), dual-systems (Hofmann et al., 2009), and, recently, motivation (Berkman et al., 2016). As mentioned in the introduction, AMP, like much research on the associations between motivation and self-control (e.g., Inzlicht et al., 2012; Job et al., 2010; Clarkson et al., 2010), broadly rose from recent empirical and theoretical issues with ego depletion research (Carter et al., 2015; Friese et al., 2018; Hagger et al., 2016; Inzlicht & Schmeichel, 2012; Lurquin & Miyake, 2017). From these findings, self-control was no longer thought to be driven by the level of resources an individual possesses but rather by an individual's motivation and attitudes. For example, some models of self-control argue that perceptions of fatigue (Clarkson et al., 2010) or willpower (Job et al., 2010) drive the likelihood of self-control occurrence such that individuals who perceive themselves to be more tired or have less willpower will be less likely to inhibit the temptation and choose the goal-directed behavior.

Although these attitudes likely play a role in self-control, AMP grew directly from the value-based model of self-control (Berkman et al., 2016) which argues that self-control is driven by the level of perceived value placed on the goal-directed compared to tempting behavior. This emphasis on perceived value is like past models of self-control (Green et al., 1994) and related constructs, such delay of gratification (Mischel et al., 1989). However, AMP is distinct from the value-based model (Berkman et al., 2016) in a few key ways.

First, as mentioned in the prior section, AMP proposes three distinct inputs for perceived value that center on the conceptualization of future identities. Research on future identities, broadly, grew from the study of self, self-concept, and identity (Erikson, 1968; James, 2013; Markus & Wurf, 1987) and, more specifically, from the study of possible selves (Markus & Nurius, 1986), self-completion theory (Gollwitzer, Wicklund, Hilton, 1982), and identity-based motivation (Oyserman & Destin, 2010). AMP utilizes future identities because they represent context-dependent, stable antecedents to achievement-related behaviors (Oyserman & Destin, 2010). In addition, AMP argues that two components of future identity—motivation and pursuit-impact self-control. The motivation for one's future identity is rooted in selfconcordance theory (Sheldon & Elliot, 1999) which grew from self-determination theory (Deci & Ryan, 2002) and the study of needs (de Charms, 1968; Maslow, 1963). On the other hand, the pursuit for one's future identity is rooted in the motivational theory of lifespan development (Heckhausen et al., 2010) which grew from research on volition (Kuhl, 1987; H. Heckahusen & Gollwitzer, 1987). Volition is broadly defined as the regulation of cognition, motivation, affect, and behavior towards a desired end state (Kuhl, 1987).

Second, AMP includes specific perceived values from Eccles' expectancy-value theory (Eccles, 2009) because these perceived values allow for empirically testable predictions and

represent key predictors of achievement-related choices (e.g., Simpkins et al., 2006; 2012). Much like the study of self-regulation, self-control, and future identity, the study of perceived value is wide-ranging and includes research from economics (e.g., Green et al., 1994) and psychology (Atkinson, 1964; Eccles, 2009; Feather, 1982; Vroom, 1964). Perceived values from Eccles' expectancy-value theory (Eccles, 2009) are distinct from past models because the four measures of value are unique and different than simple general measures of perceived value (e.g., positive and negative value; Berkman et al., 2016).

Definitions of Key Constructs in AMP

Self-Control

Self-control versus self-regulation. In some research, self-control and self-regulation are used interchangeably (Kurzban et al., 2013; Molden et al., 2016). However, AMP, like much research on self-control (e.g., Friese et al., 2018; Fujita, 2011; Hofmann et al., 2009; Milyavskaya & Inzlicht, 2016), considers self-control a distinct self-regulatory phenomenon defined as the choice between an immediate, tempting behavior (e.g., watching TV, scrolling social media, going to the movies, hanging out with friends, etc.) and a goal-directed behavior associated with a long-term goal (e.g., studying, attending a study group, paying attention in class, engaging with the tutor, etc.). Self-regulatory strategies, on the other hand, include a broad set of processes related to goal pursuit and regulation, such as goal setting, striving, monitoring, and disengagement (e.g., Carver & Scheier, 1982; Gollwitzer, 2018; Gollwitzer & Oettingen, 2012). For example, a student setting a goal to complete a certain number of math problems in an hour, concentrating hard on a math problem, or evaluating the progress they have made so far is engaging in self-regulation but not self-control since there is no choice between a goal-directed and tempting behavior. AMP applies only to self-control dilemmas and not self-regulatory processes because self-control represents (1) an important predictor of life success (Moffitt et al., 2011; Tangeny et al., 2004) and (2) an essential process to goal pursuit (Baumeister et al., 2007).

Mechanisms of self-control. The field of self-control is rich and varied with different models articulating different mechanisms for self-control. Below we discuss three prominent models in-depth and then highlight a handful of other motivational models related to the value-based model (Berkman et al., 2016).

Ego depletion. Ego depletion from the strength model of self-control (Baumeister, 2014; Baumeister et al., 2007) refers to both a behavioral outcome (i.e., exercising self-control leads to subsequent self-control failure) and a cognitive process (e.g., the amount of a domain-general resource determines self-control) (Friese et al., 2018). Although the behavioral outcome and related empirical work (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Masicampo & Baumeister, 2011; Muraven & Baumeister, 2000; Muraven & Slessaeva, 2003) are important to consider, we focus on the process of ego depletion since the goal of AMP is to posit predictions about perceived value as a mechanism between future identity and self-control. In the strength model (Baumesiter et al., 2007), ego depletion refers to domain-general resource through which individuals can exert self-control, and this resource becomes depleted through continued selfcontrol exertion. Once depleted, the individual will fail to exert self-control and only be able to re-exert self-control after a refractory period where their resource returns to a certain threshold. With the recent empirical (Carter et al., 2015; Hagger et al., 2016) and theoretical critiques (Berkman et al., 2016; Carter & McCullough, 2014; Friese et al., 2018; Inzlicht & Schmeichel, 2012; Lurquin & Miyake, 2017; Milyavskaya & Inzlicht, 2016) as well as other empirical results finding that motivation (Moller et al., 2006) and incentives (Muraven & Slessareva, 2003)

ameliorate the effect of ego depletion, the strength model's popularity has decreased as a primary model to explain the process of self-control. Considering these findings, AMP argues perceived value represents another potential mechanism of self-control.

Top-down cognitive processes. Research from dual-system models (e.g., Chaiken & Trope, 1999; Hofmann et al., 2009; Metcalfe & Mischel, 1999; Shenhav, 2017; Shiv & Fedorikhin, 1999) overlaps with ego depletion (Baumeister et al., 2007) as well as with effortful control from developmental psychology (Eisenberg et al., 2004), yet the exact mechanism posited to drive self-control is different than ego depletion. Specifically, dual-system models argue that self-control occurs when a reflective system, also known as a "cold" process, associated with a goal-directed behavior effortfully inhibits an impulsive system, also known as a "hot" process, associated with an immediate temptation. In dual-systems research, temptations lead to quick cognitive, affective, motivational, and behavioral reactions that are difficult to inhibit without conscious deliberation and enough cognitive resources. Therefore, in dualsystems research, cognitive capacity, attention, and other top-down processes represent the key mechanisms for self-control (Shenhav, 2017), and evidence for this mechanism exists across a variety of research lines, including research on individual differences in working memory predicting self-control failures (Hofmann, Gschwendner, Friese, Wiers, & Schmitt, 2008; Thush et al., 2008; Whitney, Hinson, & Jameson, 2006) as well as research on decreases in cognitive control leading to self-control failure (Friese, Wänke, & Plessner, 2006; Hofmann et al., 2008).

Based on this past research, cognitive control represents a mechanism through which self-control may occur. However, AMP focuses on perceived value for two reasons. First, despite the evidence for cognitive control, critiques, such as the theoretical vagueness of topdown processes and the overwhelming variety of measures used, exist (see debate in Evans & Stanovich, 2013; Keren, 2013; Kruglanski, 2013; Thompson, 2013). Perceived value is easier to measure and may represent a more parsimonious explanation compared to the variety of topdown cognitive processes discussed in dual-system approaches (Duckworth & Gross, 2015). Second, perceived value can be linked to future identities which together represent a new avenue for self-control research that may be more amendable to outside intervention (Berkman, Hutcherson, et al., 2017; Hulleman & Harackiewicz, 2009; Walton & Wilson, 2018). Altogether, AMP posits specific theoretical predictions about the relationship between future identities, perceived value, and self-control but, at the same, permits the incorporation of other explanations for why self-control may occur. After all, it is likely that self-control, like many other psychological constructs, is influenced by a combination of an individual's affect, motivation, cognition, and behavior as well as the broader context the individual finds themselves in.

Perceived value. The value-based model (Berkman, Hutcherson, et al., 2017; Berkman et al., 2016) argues perceived value represents the key mechanism for self-control and hypothesizes that self-control is no different than other value-based choices and, therefore, is simply a choice between what behavior contains the greater amount of perceived value in the moment. The amount of perceived value attached to either the goal-directed behavior or the tempting one is influenced by the number of value inputs, and the salience of these value inputs can change based on the context (e.g., the student sees a commercial for their favorite show so the perceived value for watching television increases) or the person's attention (e.g., the student is thinking about wanting to succeed in class, so the perceived value for studying increases). In addition, these value inputs are countless and include concrete (e.g., rewards or punishments), social (e.g., acceptance from others), or psychological (e.g., confidence) ones. Last, these values can add either positive or negative value to the goal-directed or tempting behavior; for example, effort is

a negative value input for the goal-directed behavior since effort can be inherently draining (Kool, McGuire, Wang, & Botvinick, 2013; Kurzban et al., 2013).

In a recent iteration, Berkman and colleagues (Berkman, Livingston, et al., 2017a, 2017b) put forth the identity-value model of self-regulation that theorizes identity is a particularly stable, accessible, and positive value input for self-control decisions. However, much like the value-based model, the identity-value model does not provide specific, actionable predictions about when and how identity influences value and, ultimately, self-control. In AMP, following Berkman and colleagues' call for a "systematic taxonomy of value sources," we generate four specific hypotheses related to future identity, perceived value, and self-control (Berkman et al., 2016, p. 11). The goal here is to uncover a set of future identity inputs linked to precise perceived values that are empirically testable and represent new avenues for intervention.

Other motivations. The value-based (Berkman, Hutcherson, et al., 2017) and related (Inzlicht & Schmeichel, 2012; Milyavskaya & Inzlicht, 2016) models do not represent the only motivational models of self-control. Other models argue that perceptions related to effort (Kurzban et al., 2013; Molden et al., 2016), expectations (Molden et al., 2016), depletion (Clarkson et al., 2010), and willpower (Job et al., 2010), among other constructs (e.g., Jia etal., 2016; Kotabe & Hofmann, 2015) drive self-control. Like with cognitive control, AMP does not dismiss these other motivations as mechanisms of self-control but again focuses solely on the process between future identity, perceived value, and self-control to derive new hypotheses and intervention ideas. These other motivations influence self-control although the question remains if they are the most proximal mechanism to self-control or instead simply represent inputs that influence perceived value (Berkman, Hutcherson, et al., 2017; Berkman et al., 2016; c.f., Molden et al., 2016).

Self-control strategies. Recently, self-control strategies are thought to include more than simply effortful inhibition of a temptation (e.g., Duckworth, Gendler, & Gross, 2016; Duckworth, Milkman, & Laibson, 2018; Fujita, 2011; Kurzban et al., 2013; Milyavskaya & Inzlicht, 2016). For example, Duckworth and colleagues (Duckworth et al., 2018) recently outlined a taxonomy of self-control strategies that vary on two axis: from situational (e.g., commitment devices, defaults, etc.) to cognitive (e.g., planning, social labeling, etc.) and from self-deployed (e.g., goal setting, temptation bundling, etc.) to other-deployed (e.g., planned interruptions, licensing prevention, etc.). Similarly, Fujita (2011) posits that self-control can occur can through temptation availability (i.e., creating situations where temptations are not available), nonconscious decision-making (i.e., creating negative cognitive associations between a temptation and goal-directed behavior), and cognitive reconstrual (i.e., reconstruing temptation more abstractly). Expanding on this, Fishbach and colleagues find that self-control can occur non-consciously and does not require top-down cognitive control or attention (Fishbach & Shen, 2014; Trope & Fishbach, 2000). Overall, AMP is agnostic about the strategies individual use to exert self-control and, instead, seeks to understand how perceived value acts as a mechanism through which individuals exert self-control strategies.

Related to strategies is the difference between initiation (i.e., deciding to engage in the goal-directed behavior versus a tempting behavior) versus maintenance of self-control (i.e., deciding to continue engaging with the goal-directed behavior or disengage and pursue the more rewarding tempting behavior) (e.g., Kurzban et al., 2013; Molden et al., 2016). For example, in the opportunity-cost model of self-regulation (Kurzban et al., 2013), effort is a cost signal that influences the maintenance of self-control over time (i.e., increased effort signals to the individual that they should switch to a more rewarding behavior). Similarly, in the motivated-

effort allocation model of self-regulation, Molden and colleagues (2016) argue that decisions to initiate self-regulatory behavior are driven by a person's value and expectations for success whereas their decision to maintain the self-regulatory behavior, instead, is driven by a combination of their experiences of effort and evaluation of progress. Although it is imperative to understand maintenance of self-control, AMP only focuses on the initiation of self-control since the main goal of AMP is to derive specific, actionable predictions about how future identities impact perceived values to initiate self-control in face of competing temptations. Future research is necessary to uncover whether this relationship operates similarly for the maintenance of self-control.

Future Identity

In identity-based motivation (Oyserman & Destin, 2010; Oyserman et al., 2012; Oyserman & James, 2009, 2011), self-concepts are considered multifaceted structures that encompass a host of past, present, and future identities, and these identities, in turn, carry with them content, attitudes, judgements, and behaviors that help individuals derive sense in the world. This means that future identities are cognitive representations of what individuals hope to become and contain accompanying attitudes and behaviors to help them reach this identity. Importantly, identity-based motivation builds from "working self-concept" notion (Markus & Wurf, 1987) and argues that identities and self-concepts shift based on the broader context the individual finds themselves in.

This conceptualization stands in contrast to other future-oriented self and identity theories, such as self-completion theory (Gollwitzer, 2018; Gollwitzer, Wicklund, & Hilton, 1982; Gollwitzer & Oettingen, 2012; Wicklund & Gollwitzer, 2013). In self-completion theory, self-concept is instead considered a perspective that emphasizes either the conception (e.g., selfverification: Swann & Read, 1981) or judgement (e.g., self-esteem: Campbell, 1990) of the self, and this is different than the goal perspective (Gollwitzer, 2018; Gollwitzer & Oettingen, 2012) of self-concept which is central to self-completion theory (Gollwitzer & Wicklund, 2013). The goal perspective argues that individuals set and strive for self-defining or identity goals (e.g., being an engineer), and thus, self-completion theory adds a goal perspective to self-concept and identity research

Both identity-based motivation (Oyserman & Destin, 2010) and symbolic self-completion theory (Wicklund & Gollwitzer, 2013) center on how future identities and identity goals, respectively, act as self-regulatory guides to help individuals strive towards future-oriented aspects of their identity. Moreover, future identities and identity goals exist on a similar plane in terms of content and temporal distance since both represent who individuals want to be and are either long-term (identity-based motivation) or unreachable (self-completion theory). Considering this similarity, AMP combines the definitions of future identities from both identitybased motivation (Oyserman & Destin, 2010) and self-completion theory (Wicklund & Gollwitzer, 2013). Specifically, AMP adopts a goal perspective and defines future identities as long-term, identity-tied goals that drive an individual's regulation of their attitudes, judgements, and behaviors towards reaching these identities. Moreover, in AMP, context plays an important role in shaping what future identity is salient, or on the mind, of the individual. This definition is related to numerous constructs, such as possible selves (Markus & Nurius, 1986), ideal selves (Higgins, 1987), developmental goals (J. Heckhausen et al., 2010), personal projects (Little, 1983), personal strivings (Emmons, 1986), life tasks (Cantor, Norem, Niedenthal, Langston, & Brower, 1987), and "be" goals (Carver & Scheier, 1982, 2000). AMP utilizes the term future identity from identity-based motivation (Oyserman & Destin, 2010) instead of identity goals

from self-completion theory (Wicklund & Gollwitzer, 2013) or any of these other constructs for two reasons. First, future identities better encapsulate the future-oriented aspect (e.g., "becoming an engineer") compared to identity goals ("being an engineer"). Second, in identity-based motivation (Oyserman & Destin, 2010; Oyserman et al., 2012; Oyserman & James, 2009; 2011), future identities are embedded in the social context, and context is central to the activation pathway in AMP since context ultimately shapes whether a future identity is on the mind of the individual.

Components of future identity. Characterizing future identities from a goal perspective allows AMP to expand future identity inputs to include those usually studied with mid-range and short-term goals (Gollwitzer, 2018; Gollwitzer & Oettingen, 2012). The first is the motivation for why an individual pursues their future identity rooted in self-concordance theory (Sheldon & Elliot, 1999). Importantly, want-to and have-to reasons overlap but are distinct from intrinsic and extrinsic motivation (Sheldon & Elliot, 1999; Werner & Milyavkaya, 2019). Specifically, intrinsic versus extrinsic motivation centers on goal content while want-to and have-to motivation refers to why individuals pursue the goals. For example, an individual could pursue an extrinsic (e.g., making money) or intrinsic (e.g., helping others) goal for either want-to reasons (i.e., because one is interested in or identifies with it) or have-to reasons (i.e., because one feels pressured or would feel anxious or guilty if not).

Meanwhile, the second component is the pursuit towards the future identity which is rooted in the motivational theory of lifespan development and includes primary and secondary strategies (Heckhausen et al., 2010). Primary goal engagement strategies refer to investment of time, resources, and effort towards a goal as well as asking others for help along the way. Secondary goal engagement strategies, on the other hand, refer to increasing one's importance,
expectations, and control beliefs for the goal. Pursuit in AMP includes only the primary goal engagement strategies since secondary goal engagement strategies are closely related to the motivation component and perceived value mechanism in AMP (see the pursuit pathway section for more details).

In addition to these two, there exists several other future identity inputs, such as feasibility (e.g., expectations towards reaching the future identity), content (e.g., extrinsic versus intrinsic future identities), and framing (e.g., approach versus avoidance, psychological distance, etc.) (Gollwitzer, 2018; Gollwitzer & Oettingen, 2012). These other structures likely impact self-control, but AMP does not focus on them because past research suggests connections between the three inputs in AMP and perceived value measures (Svoboda et al., 2016; Vansteenkiste et al., 2005). Future research should investigate these other future identity inputs are antecedents of self-control. For instance, past research (Trope & Liberman, 2010) finds that an individual with shorter psychological distances for their long-term goals (i.e., an individual perceives their long-term goals as closer to the present) impacts the speed and effort with which individuals pursue this goal. A reason why this psychological distance boosts goal pursuit may be due to an increase in the perceived value for goal-directed behaviors compared to competing temptations (see discussion section for a further discussion of these other future identity inputs).

Perceived Values

The value-based model of self-control (Berkman, Hutcherson, et al., 2017; Berkman et al., 2016) uses two lines of research to support perceived value as a mechanism of self-control. First, neuroimaging studies find that the ventromedial prefrontal cortex is associated with measures of value (Chib, Rangel, Shimojo, & O'Doherty, 2009; Hare, Camerer, & Rangel, 2009). Second, empirical results from dynamic valuation models find that individuals make decisions in-the-moment based on the value they find in two competing choices (Krajbich, Lu, Camerer, & Rangel, 2012; Krajbich & Rangel, 2011; Mormann, Malmaud, Huth, Koch, & Rangel, 2010). Two limitations exist from this supporting evidence. First, this research involves general, abstract measures of perceived value making it difficult to directly measure what perceived values matter for what value inputs during self-control decisions. Second, neuroimaging studies are expensive and drift diffusion models are computationally intense making it difficult to use these measures in many research settings.

Eccles' expectancy-value model. To address these issues, AMP utilizes a prominent theory in achievement motivation: Eccles' expectancy-value theory (Eccles, 2009). Expectancyvalue theory (Eccles, 2009) grew from Atkinson's expectancy-value theory (1964) and states that expectations for success (i.e., how well a person thinks he or she will do on a task) and perceived values (i.e., how important a task is to the person) are the most proximal predictors of achievement-related choices. Specifically, AMP integrates the four perceived task values from Eccles' expectancy-value model (Eccles, 2009): attainment value (i.e., the behavior is important or part of who I am), intrinsic value (i.e., the behavior is interesting and enjoyable), utility value (i.e., the behavior is relevant for my future), and effort cost (i.e., how much effort and time is needed for this behavior). Importantly, these perceived values are associated with the behavior and not the goal resulting from the behavior. In other words, a student assigns intrinsic value to studying, and this refers to the interest and enjoyment she receives from reading chapters, reviewing problems, and quizzing herself. This does not refer to the interest or enjoyment she receives from getting a good grade on the exam because of her studying.

These perceived values, especially attainment, intrinsic, and utility value, compared to expectations for success, are more positively related to decision-making, such as course-taking

and career choices (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001; Simpkins et al., 2006, 2012; Updegraff, Eccles, Barber, & O'Brien, 1996). In addition, causal evidence exists for the influence of utility value on achievement and motivation in math and science classes (Canning & Harackiewicz, 2015; Harackiewicz, Canning, Tibbetts, Priniski, & Hyde, 2015; Harackiewicz, Rozek, Hulleman, & Hyde, 2012; Hulleman & Harackiewicz, 2009). Last, recently, Galla and colleagues (Galla, Amemiya, & Wang, 2018) found that intrinsic and utility value both predicted self-reported academic self-control across different school ages, and intrinsic value was the stronger of the two predictors.

Therefore, by integrating these perceived values, AMP addresses the two limitations in value-based models of self-control (Berkman, Hutcherson, et al., 2017; Berkman et al., 2016). First, since these perceived values are distinct, AMP hypothesizes detailed predictions about the relationship between future identity inputs, perceived value, and self-control. For example, a student can attach value to studying for variety of reasons. She may see it as relevant to what she wants to become later in life (i.e., utility value), she may identify with or enjoy studying (i.e., attainment or intrinsic value), or she may think studying will require little strenuous effort or time (i.e., effort cost). By bringing this diversity of value into research on self-control, AMP can begin to answer this question: what types of perceived values are important for self-control decisions?

Second, these four perceived values are measured using self-report making it easier to identify whether perceived value is a mediator between future identities and self-control (Wigfield & Cambria, 2010). The ability to measure the mediator in the hypothesized relationship between future identities and self-control addresses past issues related to falsifiability (Berkman et al., 2016; Friese et al., 2018; Lurquin & Miyake, 2017) where selfcontrol was assumed by the choice the individual made. For instance, the individual chooses the healthy carrots over the tempting chocolate cake. In this scenario without measuring the mediator, it remains impossible to determine whether the individual exerted self-control or not since it is possible that the individual prefers carrots over chocolate cake and, therefore, did not actually experience self-control (i.e., individual did not see chocolate cake as a temptation). The precise process through which self-control occurs can only be identified by measuring the hypothesized mediator. Altogether, AMP extends value-based models and self-control research more generally by improving the specificity and measurement of perceived values.

Effort cost. Cost in Eccles' expectancy-value theory is understudied (Flake et al., 2015; Kosovich, Hulleman, Barron, & Getty, 2015) but is theorized to contain four facets: effort cost, outside effort cost, loss of value alternatives, and emotional cost. AMP focuses on effort cost which refers to how effortful and time consuming the behavior is. Factor analyses (Flake et al., 2015) finds that effort cost is a distinct construct separate from the other values and is negatively associated with academic performance, expectations, interest, and overall motivation. Hence, in AMP, a reduction in effort cost associated with the goal-directed behavior will increase the likelihood of self-control since it will change the individual's perception of how easy it will be to complete the goal-directed behavior. An important note: effort cost is different than other feasibility constructs, such as self-efficacy expectations (e.g., expectation that one can complete a behavior for a specific outcome; Bandura, 1977), outcome expectations (e.g., expectation that behavior will lead to outcome; Bandura, 1977), and general expectations (e.g., expectation about likelihood of certain outcome Gollwitzer & Oettingen, 2012). Specifically, effort cost refers to perceptions of how effortful and time consuming the behavior will be (e.g., "Studying demands too much of my time!") compared to feasibility judgements which refer to expected probability

of success related to the behavior ("I expect to do well while studying!") or the outcome associated with that behavior (e.g., "I expect to do well in the class!") (Flake et al., 2015).

Theoretical Predictions from AMP

In the following sections, we outline the three pathways present in AMP by first defining each hypothesis and then discussing the theoretical and empirical support for each pathway. Table 1 - 1 outlines the theoretical support for each pathway.

The Activation Pathway

The salience of a future identity (i.e., activation) in the corresponding domain to a selfcontrol decision leads the individual to find utility value, or relevance, for the goal-directed behavior increasing the likelihood of self-control.

Moreover, contextual factors, such as the broader culture, sociodemographic groups, and the immediate setting, shape what future identity is activated. For example, if a contextual factor, like being at the library, makes salient a career future identity of becoming an engineer when the student is confronted with a temptation, such as watching her new favorite show on TV, she will find the relevance and usefulness of the studying since she will see a connection between what she is doing now and what she wants to become later on. However, if the student is at the library but chatting with friends, her career future identity will likely not be activated, and the student will not find the utility of studying increasing the likelihood she watches her favorite TV show instead. Even more, if her career future identity is not activated, she may not experience a selfcontrol dilemma because she will see not see studying as a goal-directed behavior. Because of this, the activation pathway in AMP takes primacy over the motivation and pursuit pathways because a future identity needs to be salient for the individual to register a self-control dilemma. If the future identity is not salient, the individual will not register a self-control decision, and there will be no effect from motivation or pursuit of the future identity on self-control.

Core theoretical and empirical support. Core theoretical support for the activation pathway in AMP is rooted in identity-based motivation (Oyserman & Destin, 2010; Oyserman et al., 2012; Oyserman & James, 2009; 2011). Broadly, identity-based motivation (Oyserman & Destin, 2010) posits that an identity, such as a future identity, is made salient by the context, and once salient, it is motivating and guides self-regulatory behavior. More specifically, identity based-motivation includes three facets: dynamic construction, action readiness, and procedural readiness (Oyserman et al., 2017). Dynamic construction refers to the broader contexts influence on what identity is salient. It is important to note that in dynamic construction context does not lead to constantly fluctuating identities because individuals experience similar contexts over time (Oyserman et al., 2017). In other words, the same identities will be salient often, and therefore, identities represent a consistent self-regulatory guide. Action readiness refers to individuals behaving in identity-congruent ways and pursuing behaviors that relate to their salient identity. Last, procedural readiness refers to how individuals judge and interpret difficulties that are connected to their salient identity. For example, a student may interpret a hard homework assignment as something that is important and possible or unimportant and impossible, and this has downstream consequences for how much effort they put towards the behavior.

Results from experimental research (Destin, 2017; Destin & Oyserman, 2009, 2010; Lewis Jr & Oyserman, 2015; Oyserman, Destin, & Novin, 2015) find that contextual factors, such as seeing a path open to college, make salient specific identities which, in turn, motivate individuals to put more effort towards achieving them. For example, middle students in an education-dependent future identities condition (i.e., received materials promoting the financial success of a college education) reported higher effort and an increased likelihood to complete an extra credit assignment compared to students in the education-independent future identities condition (i.e., received materials promoting the financial success of non-college careers) (Destin & Oyserman, 2010, Study 2). At the same time, other correlational studies find evidence that salient future identities are associated with identity-congruent behavior. For example, Destin and Oyserman (2010, Study 1) found that middle school students who possessed an education-dependent future identity (i.e., wanting a career that requires a four-year college education) compared to those who possessed an education-independent future identities (i.e., not wanting a career that requires a four-year college education) were more likely to report better grades and more effort over time. Other empirical research with high school and college students finds similar results for students' interpretation of difficulty, effort, and achievement (Landau, Oyserman, Keefer, & Smith, 2014; Lewis Jr & Oyserman, 2015; Oyserman et al., 2015).

AMP is separate from identity-based motivation in three important ways. First, AMP includes only future identities while identity-based motivation includes past, present, and future identities (Oyserman & Destin, 2010). Second, AMP explicitly connects identity-based motivation with self-control research while identity-based motivation examines self-regulation and goal pursuit more broadly (Oyserman et al., 2017). Last, and most importantly, AMP extends the action readiness component of identity-based motivation. Action readiness refers to individuals behaving in ways that are identity-congruent with their activated identity, and much empirical evidence exists for this (Destin & Oyserman, 2010; Landau et al., 2014; Lewis Jr & Oyserman, 2015; Nurra & Oyserman, 2018; Oyserman et al., 2015). However, action readiness and the accompanying evidence does not investigate how individuals act in identity-congruent ways but instead focuses on the downstream behavioral consequences of identity-congruence

(e.g., persistence, making identity-related choices, etc.). AMP, meanwhile, investigates the mechanism through which individuals behave in identity-congruent ways by examining perceived value as the key mediator between future identity and self-control. In AMP, when an identity is activated, the individual will behave in identity-congruent because they will see those behaviors as more relevant for their activated future identity. In other words, AMP takes a mechanistic perspective to the action readiness component of identity-based motivation and investigates why individuals behave in identity-congruent ways during self-control dilemmas.

Related theoretical and empirical support. The activation pathway in AMP is related to several other theoretical frameworks as well. The goal hierarchy premise which is include in many theories (Carver & Scheier, 1982; Duckworth & Gross, 2014; Eccles & Wigfield, 2002; Fujita, Trope, Liberman, & Levin-Sagi, 2006; Husman & Lens, 1999; Kauffman, 2004; Kruglanski et al., 2002; Simons et al., 2005) argues that higher-order goals sit atop a hierarchy followed by mid-range goals and finally short-term, daily goals. Although these hierarchies are usually discussed in relation to goals, future identities are conceptually like goals that are normally found at the top of hierarchies, and in some characterizations, goal hierarchies include future identities at the top (Carver & Scheier, 1982). These hierarchies are related to AMP because both underscores the connection between short-term and long-term goals. For example, in AMP and theories with goal hierarchies (Carver & Scheier, 1982), a future identity of becoming an engineer is connected to the choice of studying through a set of mid-range goals, such as doing well in school. However, AMP is different than other goal hierarchies because it explicitly links future identities with self-control decision through perceived value. Other theories (e.g., Carver & Scheier, 1982) include additional mechanisms and assess self-regulation more broadly.

Two other related theories are construal level theory of psychological distant (Trope & Liberman, 2010) and action identification theory (Vallacher & Wegner, 1987). In action identification theory (Vallacher & Wegner, 1987), abstraction or high-level construal leads individuals to consider motivation whereas concretization or low-level construal leads individuals to consider specificity (e.g., details, actions, etc.). Similarly, in construal level theory of psychological distant (Trope & Liberman, 2010), high level of construal predicts seeing broader patterns or decisions as being interconnected making it more likely an individual will choose the behavior linked with their distal, higher-level construal. Meanwhile, a low level of construal predicts seeing unique features of an object not connected with others making it likely an individual chooses the behavior associated with the short-term goal. Fujita and colleagues (Fujita et al., 2006) examined how attending to global, abstract construal level for an event compared to local, concrete construal level for an event promoted more negative evaluations of temptations, increased likelihood of exhibiting self-control, and a higher preference for longterm outcomes. Even more, Fujita and colleagues (Sklar & Fujita, 2017) recently have argued that a high construal level is necessary for the link between identity and perceived value to be established since identity is a form of abstraction for one's view of their self. Although abstraction from the construal level theory of psychological distance (Trope & Liberman, 2010) and activation from AMP may be similar and both connected to value, AMP is different because it examines more facets of identity (motivation and pursuit) and specifics the exact perceived values that is connected to activation (utility value).

The last related theory is self-completion theory (Gollwitzer, 2018; Gollwitzer & Oettingen, 2012; Wicklund & Gollwitzer, 2013), which as stated in the future identity section, argues that individuals strive to behave in ways that help them achieve identity goal attainment

(e.g., a student completes behaviors that help them see themselves as an engineer) (Brunstein & Gollwitzer, 1996). However, AMP is different than self-completion theory because selfcompletion theory investigates the behavioral consequences of pursuing identity goals (e.g., engaging in identity-relevant activities, displaying identity-related status symbols, etc.; Brunstein & Gollwitzer, 1996; Harmon-Jones, Schmeichel, & Harmon-Jones, 2009). Meanwhile, AMP centers on why future identities (conceptually like identity goals) lead to self-control through perceived value. In sum, across these related theories, the activation pathway in AMP extends them either by assessing different identity inputs or by adopting a mechanistic approach that seeks to understand how perceived value acts as mechanism between identity and behavior.

The Motivation Pathway

Want-to motivation (i.e., interest in or identification with) for a future identity boosts the attainment (i.e., importance) or intrinsic (i.e., interest) value for the goal-directed behavior increasing the likelihood of self-control. For example, a student who wants to become an engineer because she is interested in it or identifies with it will find paying attention in class interesting or important to who she is increasing the likelihood of self-control occurring when faced with a temptation like texting friends. This value is in addition to utility value already placed on the goal-directed behavior because of the activated future identity.

Have-to motivation (i.e., external pressure or feelings of guilt/anxiety) for a future identity does not increase attainment or intrinsic value for a goal-directed behavior and, thus, does not increase likelihood of self-control. For instance, a student who must become an engineer because she feels pressured by others, such as her parents or friends, or because she feels anxious or guilty if she did not pursuit it will be less likely to find studying interesting or important, thus, reducing the likelihood of self-control occurring. After all, have-to reasons are external pressures, either real or perceived, that undergird why individuals pursue their future identities making it unlikely that an individual will see a behavior like studying as personally meaningful (attainment value) or interesting (intrinsic value). An important point is that future identities can be pursued for both want-to and have-to reasons, and past research supports this by finding that want-to and have-to reasons are uncorrelated (Milyavskaya & Werner, 2019). For instance, an individual who pursues a future identity for both want-to and have-to reasons will find a goal-directed behavior as interesting or important because, even though they feel pressured to pursue a future identity, they also are interested in or identify with their future identity as well.

Core theoretical and empirical support. The motivational pathway in AMP is rooted in self-concordance theory (Sheldon & Elliot, 1999) which argues that the reasons why individuals pursue personal goals (i.e., month- to year-long goals, such as semester-long goals) affects their goal progress and attainment. More specifically, in self-concordance theory (Sheldon & Elliot, 1999), an individual can pursue a goal because of autonomous (intrinsic and identified) or controlling (external and introjected) reasons. In AMP, I define identified and intrinsic reasons as want-to reasons and external and introjected reasons as have-to reasons comparable to other research on self-regulation and self-control (e.g., Milyavskaya, Inzlicht, Hope, & Koestner, 2015). An identified reason is defined as a strong identification with the goal, and an intrinsic reason is defined as interest or enjoyment with the goal. Meanwhile, an external reason is defined as how an individual can feel pressured to pursue the goal from important individuals, such as parents, friends, or teachers, and an introjected reason is defined as an individual's feelings of guilt or anxiety if they do not pursue the goal. As mentioned earlier, these two sets of reasons are not mutually exclusive as individuals may pursue goals for both want-to and have-to reasons.

Longitudinal studies in goal self-concordance find that goals pursued for want-to reasons are positively associated with goal progress in a variety of domains, including health, work, and education (Bono & Judge, 2003; Judge, Bono, Erez, & Locke, 2005; Koestner et al., 2002; Koestner, Otis, Powers, Pelletier, & Gagnon, 2008; Milyavskaya et al., 2015; Sheldon & Elliot, 1998, 1999; Sheldon & Houser-Marko, 2001; Werner et al., 2016). In the education domain (Sheldon & Elliot, 1999), college students listed their personal goals for the semester and the reasons why they pursued them. Over the semester, their goal effort and progress were assessed, and results found that students who pursued their goals for more want-to compared to have-to reasons were more likely to report higher effort towards the goal which, in turn, was associated with higher goal progress. These results have been replicated with college students in follow-up studies such that pursuing goals for more want-to compared to have-to reasons positively predicted goal attainment directly (Sheldon & Houser-Marko, 2001). Similarly, studies on wantto and have-to reasons for achievement goals (i.e., learning goals related to education) find that mastery or performance goals pursued for want-to reasons positively predict interest, selfefficacy, deep learning, help-seeking, and persistence (Gaudreau, 2012; Lee & Bong, 2016; Michou, Vansteenkiste, Mouratidis, & Lens, 2014; Senko & Tropiano, 2016; Sommet & Elliot, 2017; Urdan & Mestas, 2006).

Moreover, several experimental studies (Deci, Koestner, & Ryan, 1999; Moller et al., 2006; Vansteenkiste et al., 2005) have manipulated want-to versus have-to contexts to experimentally test the causal effect of want-to versus have-to on motivation and achievement. In one study, Moller and colleagues (Moller et al., 2006) randomly assigned participants to a want-to choice condition (i.e., the participant chooses the task to complete) or have-to choice condition (i.e., the participant is told what task to complete) and then they completed an unsolvable puzzle.

Results found that students assigned to the want-to choice condition compared to the have-to choice condition persisted longer on the unsolvable task suggesting that creating a want-to context, or one where an individual chooses what they want to do, increases effort. However, a want-to or have-to context is different than want-to and have-to motivation that center on why individuals pursue their future identities. In a more recent experiment (Leduc-Cummings et al., 2017), participants asked to write about their want-to compared to have-to reasons for dieting reported less perceived obstacles towards attaining this goal. This study provides evidence that motivation can be manipulated and that want-to motivation may lead individuals to experience less temptations.

Last, empirical research from the shifting priorities model of self-control (Inzlicht & Schmeichel, 2012) also have studied the relationship between want-to and have-to reasons and goal progress using a similar paradigm as empirical research from self-concordance theory (Milyavskaya et al., 2015; Werner et al., 2016). For example, in one study, Milyavskaya and colleagues (Milyavskaya et al., 2015) find that want-to semester goals for college students are negatively related to self-reported obstacles and positively related to self-reported goal progress. On the other hand, have-to semester goals were positively related to more obstacles and more effort but no goal progress. Additional mediational analyses showed that less obstacles but not more effort mediated the association between want-to semester goals and goal progress, suggesting that the reason why want-to goals were associated with more progress was because students encountered less obstacles not because they exhibited more effort. Conversely, the mediational analyses for have-to semester goals revealed that both goal effort and obstacles increased, nullifying any effect on goal progress. This study provides evidence that want-to motivation leads to less experiences of temptations, and this explains why want-to motivation is

related to goal progress. AMP may clarify these findings since want-to motivation may reduce the experience of temptation through increases in perceived value for the goal-directed behavior.

AMP is different than self-concordance theory (Sheldon & Elliot, 1999) in three ways. First, AMP applies want-to and have-to reasons to future identities instead of personal, or monthand year-long, goals. Future identities are tied to these personal goals through hierarchies (e.g., Carver & Scheier, 1982; Kruglanski et al., 2002) but are different because future identities are directly embedded within the broader context. Second, AMP focuses on self-control dilemmas where self-concordance theory (Sheldon & Elliot, 1999) considers self-regulation and achievement broadly. Last, AMP applies a mechanistic perspective to self-concordance theory (Sheldon & Elliot, 1999) to explain how it is that want-to motivation leads to better self-control. Self-concordance (Sheldon & Elliot, 1999) examines the consequences, such as goal progress and attainment, of want-to and have-to motivation but does not examine the process through which want-to motivation leads to these consequences (i.e., how does want-to motivation lead to progress and attainment?). AMP addresses this by specifying the exact perceived value (i.e., attainment and intrinsic) that explains how want-to motivation may lead to self-control.

Related theoretical and empirical support. Self-concordance theory (Sheldon & Elliot, 1999) grew from self-determination theory (Deci & Ryan, 2002) which is a theory regarding how intrinsic motivation compared to extrinsic motivation leads to the fulfillment of three basic needs (competence, autonomy, and relatedness) that drive human behavior. Moreover, intrinsic motivation, because it helps to fulfill these needs, leads to greater goal attainment and well-being. Self-concordance theory (Sheldon & Elliot, 1999) similarly argues that goals pursued for want-to reasons compared to have-to ones will lead to greater well-being because of the satisfaction of these same needs. AMP is different than self-determination theory (Deci & Ryan,

2002) because AMP considers identity as the most important driver of behavior compared to competence, autonomy, or relatedness needs.

The Pursuit Pathway

The pursuit (i.e., investment of effort, time, and resources) towards a future identity will decrease the effort cost for the goal-directed behavior (i.e., how demanding and timeconsuming the behavior is) increasing the likelihood of self-control.

Lower effort cost increases the overall, positive perceived value of goal-directed behavior since effort cost is a negative value associated with the goal-directed behavior. For example, a student who invests time, resources, and effort into becoming an engineer will choose going to the study group over scrolling social media because they will see the study group as less effortful and time-consuming since they are already invested towards becoming an engineer and willing to spend time, effort, and resources towards it. This value is in addition to the utility value the student already placed on the goal-directed behavior because of the activated future identity.

Core theoretical and empirical support. The core theoretical framework for the pursuit pathway in AMP is the motivational theory of lifespan development (J. Heckhausen, 2007; J. Heckhausen et al., 2010; J. Heckhausen, Wrosch, & Schulz, 2019) which argues that individuals regulate their development towards developmental goals (e.g., getting a job, getting married, etc.) through the use of goal engagement and disengagement strategies. Goal engagement contains three types of strategies: selective primary control, selective secondary control, and compensatory primary control. Selective primary control refers to the investment of time, effort, and skills towards a goal. Selective secondary control refers to increasing motivational commitment towards the goal by boosting the value of the goal and believing you can reach it. Last, compensatory primary control refers to asking others for help or using outside resources.

Meanwhile, goal disengagement refers to devaluing the importance of the goal, decreasing one's expectations for it, or reducing one's blame for failing to achieve it.

The majority of empirical research on goal engagement, especially primary control strategies, occurs in the health domain and finds that goal engagement predicts individuals' wellbeing and health (Brandtstädter & Renner, 1990; Freund & Baltes, 1998, 2002; Haase et al., 2008; Haase, Heckhausen, & Silbereisen, 2012; Salmela-Aro, 2009; Wiese, Freund, & Baltes, 2002; Wrosch, Dunne, Scheier, & Schulz, 2006; Wrosch, Schulz, & Heckhausen, 2002). Other research finds that goal engagement in career domain predicts higher levels of work goal importance, self-efficacy for work goals, career search effort, and apprenticeship attainment (Haase et al., 2008; J. Heckhausen & Tomasik, 2002; Kracke, 2002; Nagy, Koller, & Heckhausen, 2005; Pinquart, Juang, & Silbereisen, 2003; Poulin & Heckhausen, 2007; Svoboda et al., under review). For example, in a study of German university students transitioning from school-to-work (Svoboda et al., under review), career goal engagement predicted career goal progress, career satisfaction, and employment one year later. Findings from these empirical studies support goal engagement as a predictor of achievement-related outcomes in a variety of domains and suggests they also may lead to boosts in perceived value for goal-directed behaviors during self-control decisions.

AMP utilizes motivational theory of lifespan developmental as a theoretical framework because it applies volitional constructs (J. Heckhausen, 2007) to long-term, developmental goals that are conceptually like future identities. However, AMP is distinct in a handful of key ways. First, AMP focuses only on goal engagement not both goal engagement and disengagement because it seeks to explain how future identity's impact on self-control. Second, it applies goal engagement to future identities instead of developmental goals. Although conceptually similar, applying goal engagement strategies to future identities embeds them in context such that they only influence behavior once the accompanying future identity is activated. Moreover, and as mentioned earlier, AMP adopts a mechanistic perspective to understand how investment towards future identities relate to every day self-control dilemmas through changes in perceived value.

Last, AMP rearranges the three processes central to goal engagement. Specifically, AMP includes selective primary control (i.e., investing time, effort, and resources) and compensatory primary control (i.e., asking others for help or utilizing outside resources) in the pursuit construct and does not include selective secondary control which refers to the value and expectations for the goal, in its pursuit measure. There are two reasons for this. First, the motivation pathway in AMP already centers on the value for a future identity since it assesses whether individuals pursue their future identities because they find it important or interesting or because they feel pressured. Second, the perceived value mechanism also includes a motivation component targeted at the self-control dilemma. Therefore, the motivation aspect of secondary control strategies is subsumed within other components of AMP.

Related theoretical and empirical support. The motivational theory of lifespan development grew from the model of optimization in primary and secondary control (J. Heckhausen, 2006) and action-phase model of developmental regulation (J. Heckhausen, 2006; J. Heckhausen, Wrosch, & Fleeson, 2001) and is related to other developmental regulation theories, such as the dual-process model of assimilative and accommodative coping (Brandtstädter & Renner, 1990) and the model of selection, optimization, and compensation (Freund & Baltes, 1998). Past research (Haase, Heckhausen, & Wrosch, 2013) finds significant overlap across these developmental regulation theories. Thus, AMP is connected to these other developmental regulation theories (Brandtstädter & Renner, 1990; Freund & Baltes, 1998) but chooses the motivational theory of lifespan development as its core theoretical support because of its emphasis on goal engagement as an investment of effort, time, and resources and asking others for help compared to more psychological constructs present in the other theories. Even more, the motivational theory of lifespan development grew from general goal pursuit models such as the Rubicon model of action phases (H. Heckhausen & Gollwitzer, 1987) and theory of if-then planning (Gollwitzer, 1999, 2018; Gollwitzer & Oettingen, 2012). However, the difference with these theories is that they assess regulation towards short-term goals (e.g., doing well on test, if-then plan to overcome temptation, etc.) compared to AMP and the motivational theory of lifespan development which both examine future identities and developmental goals, respectively.

Discussion

Why these future identity inputs matter?

There are various ways to conceptualize future identities (see next section); however, in AMP, I center on three components—activation, motivation, and pursuit—for two reasons. First, past theoretical frameworks (Heckhausen et al., 2010; Oyserman & Destin, 2010; Sheldon & Elliot, 1999) each emphasize the importance of these three constructs as predictors of achievement-related behaviors. Second, these three components encapsulate the entirety of goal setting and pursuit as theorized in past research (Carver & Scheier, 2001; H. Heckhuasen & Gollwitzer, 1987). For example, a future identity must first be activated, or on the mind of the student, before this identity can impact her attitudes, behavior, and judgements. Therefore, activation is an essential step to goal pursuit. After activation, a student's motivation for their future identity will help the goal pursuit feel easier and increase the likelihood she chooses behaviors that help her reach it (e.g., going to a study session instead of watching a movie). Last, there are many goals individuals feel motivated for but ultimately do not reach because they have not invested the necessary time, resources, and effort to get there. AMP's pursuit pathway includes this important component of goal pursuit that is often neglected in prior research (Heckhausen, 2007). Thus, AMP borrows from past research that emphasizes the importance of both motivation and volition towards goal setting and pursuit (e.g., Gollwitzer, 2018).

Most past research investigates only one of these components; for instance, motivation researchers study motivation (e.g., Dweck & Elliot, 1988) and identity researchers study identity (e.g., Destin & Oyserman, 2010). However, by focusing on one aspect, these models do not capture the additional components necessary for goal setting and pursuit (Gollwitizer, 2018; Gollwitzer & Oettingen, 2012). For instance, studying only motivation for a goal ignores if the individual is thinking about the goal (activation) and if the individual invests the time, resources, and effort to get there (pursuit). Most importantly, interventions that target all three components increase the robustness since these interventions boost the likelihood the student will experience benefits from them. A student who is not motivated for their career future identity will experience benefits from interventions that increase the salience of their future identity and the investment towards it.

What other future identity inputs matter?

As mentioned in the future identity structures section, there are numerous other components of future identity, including but not limited to the content (extrinsic/intrinsic, etc.), framing (e.g., approach/avoidance, promotion/prevention, etc.), specificity, psychological distance, commitment, and expectations for success (Gollwitzer, 2018; Gollwitzer & Oettingen, 2012). All these other structures represent distinct future identity inputs that may increase the likelihood of self-control through changes in specific perceived values. Future research should investigate their relationship with perceived value and self-control to build a taxonomy of future identity inputs that impact self-control. For instance, an approach-oriented future identity may increase self-control by making the individual more interest in the goal-directed behavior compared to individuals who have an avoidance-oriented future identity. Similarly, an individual who has high expectations for success in reaching a future identity may place even more relevance on the goal-directed behavior since the individual expects to reach their identity and sees the goal-directed behavior as important to doing this. Altogether, future research should build a list of future identity inputs and corresponding perceived values to understand which components of future identities impact which perceived values.

Is perceived value the only mechanism?

AMP centers on perceived value as mechanism but also recognizes other mechanisms also help to explain self-control. For example, certain self-regulation and self-control models (Clarkson et al., 2010; Job et al., 2010; Kurzban et al., 2013; Molden et al., 2016) find constructs, such as expectations, evaluation of progress, and perceptions of fatigue, as mechanisms of selfcontrol. Moreover, dual-system approaches (Hofmann et al., 2009) find that cognitive control and other top-down processes impact individuals' ability to inhibit dominant responses and thus are important for self-control strategies like effortful inhibition. Further, the diversity of strategies individuals can use for self-control (Duckworth et al., 2018) suggests that a diversity of mechanisms related to cognition, motivation, emotion, and behavior exist to explain these varying types of self-control strategies. Future research should begin to link self-control mechanisms with self-control strategies to understand what mechanisms are important for certain self-control strategies but not others.

56

How to test AMP?

To fully test AMP, it is essential to measure self-control as a choice between a goaldirected behavior versus a tempting behavior. Therefore, new methodologies, such as those applied by Galla and colleagues (Galla et al., 2014), are needed to test how individuals choose between goal-directed behaviors versus tempting behaviors in-the-moment. For example, one study could manipulate the salience of a career future identity and see if the student chooses a tempting behavior, such as playing a video game, or a goal-directed behavior, such as studying for a test. Eye-tracking or mouse-tracking methods also may help understand individuals' choices between goal-directed and tempting behaviors (Freeman, 2018) because they can measure individuals' immediate choices between two options (Sullivan, Hutcherson, Harris, & Rangel, 2015). In addition, to test AMP, it also is imperative to measure perceived value as a mediator between these future identity inputs and self-control. Recent research (Galla et al., 2018) investigated the relationship between perceived values from Eccles' expectancy-value theory (Eccles, 2009) and self-control (measured through self-report) and found that in an academic context intrinsic value and utility value both predicted self-control although intrinsic value was more strongly predictive of self-control. Future research should measure future identity components (activation, motivation, and pursuit), perceived value, and self-control in the same study to investigate perceived value as a mediator.

What dispositional and contextual factors matter?

Future research is needed to investigate potential dispositional moderators within AMP, such as trait level self-control (Hofmann et al., 2012a), theories of willpower (Job et al., 2010), and perceptions of mental fatigue (Clarkson et al., 2010). For instance, higher levels of trait self-control are related to less reported temptations during an individual's daily life (Hofmann et al.,

2012). Thus, it is possible that trait self-control may moderate the relationship between pursuit and self-control such that pursuit will reduce effort cost for individuals higher in trait self-control but not those lower in trait self-control since individuals with higher trait self-control may have the ability to control the investment towards their future identity.

Additionally, it is imperative to consider contextual and structural moderators, such as socioeconomic status (SES), neighborhood, and school factors. For example, SES may moderate the relationship between have-to reasons for a future identity and self-control such that have-to motivation may increase self-control for students from lower SES backgrounds since past research finds individuals from lower SES backgrounds are more interdependent (Kraus & Keltner, 2009; Stephens, Townsend, Hamedani, Destin, & Manzo, 2015). At the same, a student from a lower SES background may be less likely to exert self-control because their career future identity is activated less often than a student from a higher SES background. This student from a lower SES background may believe, for example, that becoming an engineer is unreachable because of their financial situation, and this may influence whether becoming an engineer is on their mind and if they even experience self-control dilemmas. In this case, even if the student is in school, they may not exert self-control, not because they lack the capacity or ability, but rather because their career future identity is not activated due to the broader context and, therefore, they do not see the value in paying attention.

This has important implications. Compared to past models of self-control (Baumeister et al., 2007; Hofmann et al., 2009) that would characterize this failure from a deficit perspective (i.e., low capacity or ability), AMP characterizes this failure as driven by the broader context the student finds themselves in. If the student goes to a low-resourced school, experiences financial instability, and lives in a neighborhood without much opportunities, they may rightfully believe

that becoming an engineering is unattainable, and this leads to their future identity rarely being salient resulting in their disengagement from school. Therefore, AMP shifts the question of what causes self-control failure from solely the individual's shortcomings to instead the connection between the broader context and how individuals conceive of their future selves.

Intervention Recommendations

The second major goal of AMP is to develop and test new interventions in the education domain to improve self-control and achievement over the long-term. Many interventions in social psychology are rooted in self-construal and subjective meaning-making (Walton & Wilson, 2018) and argue that subtle changes in how individuals perceive themselves, others, or experiences can have impact on their attitudes and behaviors. Moreover, these interventions sustain long-term behavior change in two ways. First, they can target recursive processes during where initial changes in perceptions lead to positive outcomes and new available opportunities and these positive outcomes produce further changes in perceptions (Walton & Wilson, 2018; Yeager & Walton, 2011). Second, they can target broader situational structures and provide improved available opportunities or resources which, in turn, improve the individual's perceptions and lead to positive outcomes.

Examples of past social psychological interventions include those targeting only identity (Destin & Oyserman, 2010), belonginess (Walton & Cohen, 2011), relevance (Hulleman & Harackiewicz, 2009), mindsets (Paunesku et al., 2015), and planning (Chen et al., 2017). AMP's hypotheses suggest a cumulative effect of identity, motivation, and pursuit on self-control and, therefore, push for interventions that target all three simultaneously. Moreover, an intervention based in AMP will lead to self-control through changes in perceived value.

Any intervention rooted in AMP must start by activating a future identity since activation of a future identity is necessary for individuals to experience a self-control dilemma. Without this activation, an individual will not see the relevance of the goal-directed behavior, and the motivation and pursuit for the future identity will not have any impact on self-control. An AMP intervention can build from identity-based interventions (e.g., Nurra & Oyserman, 2018; Oyserman et al., 2006; Oyserman & Destin, 2010) and activate a future identity using openended responses (e.g., "What do you want to do 10 years from now?") or contextual manipulations (e.g., graphic showing the path to college as open). For example, an AMP intervention may start by asking students what they want to do later in life, and this could activate students' career future identity. At the same time, an intervention could provide students with college planning materials that subtly activate a students' college-dependent future identity. Even more, interventions could combine both by first asking students what they want to do later in life and then showing them materials that promote an education-dependent future identity.

Next, an AMP intervention should target motivation through a writing exercise. Past research (Leduc-Cummings et al., 2017) asked students to attend to either their want-to or have-to reasons for eating healthy and found that students who wrote about their want-to reasons compared to have-to reasons reported less obstacles towards eating healthy. This writing exercise could be adapted to the education domain and ask students to write about their want-to reasons for pursuing their career future identity. This may help students attend to the want-to reasons over their have-to ones and lead to a boost in attainment and intrinsic value for the goal-directed behaviors when they experience competing temptations like watching *TV* or hanging out with friends.

Last, an AMP intervention should bolster the pursuit pathway. Chen and colleagues (Chen et al., 2017) designed an intervention that may serve as a sample for how to target the pursuit pathway. In this intervention, college students chose a handful of studying strategies for an upcoming statistics exam and then completed a short prompt on why they chose that study strategy. The goal of this intervention was to help students think about how they will put effort time, and resources towards studying for the exam. A similar writing exercise could be adapted to help students think about how they will invest time, effort, and resources towards their career future identity. If students spend time to consider their investment for career future identity, they may boost their actual investment and, in turn, see reduced effort cost for goal-directed behaviors like studying.

Putting it all together, AMP interventions aim to bolster a students' identity, motivation, and pursuit to sustain self-control and behavior change over the long-term. The three pathways each represent a unique avenue to improve how individuals perceive goal-directed behaviors, such as studying, paying attention in class, or completing extra credit assignments, increasing the likelihood of self-control and, ultimately, achievement. One strength of the AMP intervention is that if students pursue their career future identity for have-to reasons or do not possess a high level of investment towards it they may still experience benefits from the intervention since it targets all three pathways simultaneously. Although these three pathways have been studied individually (e.g., Destin & Oyserman, 2010; Heckhausen et al., 2010; Sheldon & Elliot, 1999), they have been rarely tested empirically but past theoretical research hypothesizes the importance of all three for goal pursuit (e.g., Gollwitizer, 2018; Gollwitzer & Oettingen, 2012).

Beyond social psychological interventions

In addition to designing new social psychological interventions, AMP also demonstrates the importance of future identities in broader programs that center on achievement and wellbeing. For example, two-generation programs (Chase-Lansdale & Brooks-Gunn, 2015) provide children with early education opportunities and parents with a multitude of family-, education-, and work-based resources, such as community college opportunities, job training, parenting classes, and mental health services. The goal is to improve life opportunities and achievement for parents and children from lower socioeconomic backgrounds. Although these programs are already beneficial in many respects and provide important resources to families, introducing content that emphasizes activation, motivation, and pursuit of career future identities may improve them even further. For example, creating curriculum that target each pathway, into the education and job training portions of the program could help parents see greater value for goaldirected behaviors, such as studying, and ultimately lead to more success in attaining their hoped-for career. This could be done through a combination of group and reflection exercises where parents share their future identities, why they are motivated for them, and how they will invest time and resources towards them. This may be heightened because families in twogeneration programs are usually from lower SES backgrounds, and many times individuals from lower SES background find paths towards success closed because of their financial situations (Destin, 2017; Destin & Oyserman, 2010). Thus, writing exercises and other materials that make the career future identity salient and coupling these with ones that target motivation and pursuit may change these parents' perceptions of whether their career future identity is attainable leading to increased self-control.

AMP extends to even broader policies such as state educational policies. For instance, states could develop curriculum that help students to reflect on their future identity, why they are motivated for it, and their investment towards it. However, AMP also informs a broader approach: college and career counseling curriculum could be designed with the AMP pathways in mind and help students from lower SES backgrounds see college as financially-viable. For instance, these programs could help students from lower SES backgrounds find and apply for loans and scholarships to college, in turn, increasing the likelihood that these students' career future identities are salient and their associated motivation and pursuit for them impacts their daily self-control. Most importantly though, college and universities could lower their cost or pay tuition to students from lower SES backgrounds. This will help make college and universities more financially-accessible, and students from lower SES backgrounds may feel like their career future identity is reachable making it likely that their future identity increases their self-control. In sum, implications from AMP apply to programs and policies more expansive than simply other social psychological interventions.

Conclusion

AMP moves self-control research forward by generating four unique theoretical hypotheses regarding the process through which future identity, perceived value, and self-control operate. Moreover, following these hypotheses, AMP demonstrates the importance of considering an individual's identity, motivation, and pursuit in concert for social psychological interventions and broader policies and programs. Overall, the mechanistic approach of AMP makes it distinct from past theories and leads to innovations for both basic and applied research.

Chapter 2: Motivation, Pursuit, and Success during the Transition from University to Work

Introduction

Motivation and pursuit towards a career future identity, especially for college graduates, is often thought of as important for career success with popular lore emphasizing the importance of "following your passion" as a foundation for motivational pursuit, persistence, and eventual success. Empirical studies with college students and graduates have demonstrated the importance of both motivation (e.g., pursuing a career future identity because one really identifies with it, a core characteristic of goal self-concordance) and pursuit (e.g., investing time and effort pursuing a career future identity, the core characteristic of goal engagement) as key antecedents of career success (Bono & Judge, 2003; Haase et al., 2008; Judge et al., 2005; Tomasik, Hardy, Haase, & Heckhausen, 2009; Vallerand, 2010). However, few studies have examined both aspects as antecedents of career success and their dynamic interplay in an integrated study. The present 4wave longitudinal study investigated associations between self-concordance (Sheldon & Elliot, 1999), goal engagement (J. Heckhausen et al., 2010), and career success during the transition from university to work. We focused on this transition as a high-stakes context with high ecological validity that represents a key developmental milestone in the transition to adulthood across different cultures with long-term consequences for financial and psychological stability (Haase, 2007; Lent & Worthington, 1999; Nurmi & Salmela-Aro, 2002; Schoon & Silbereisen, 2009). We (1) examined how self-concordance and goal engagement for a career future identity each predicted career success and then (2) probed how self-concordance predict goal

engagement and vice versa. In addition, and importantly, the results from this chapter ignited the development of the AMP process outlined in Chapter 1 (see Chapter 2 discussion).

The Role of Motivation: Career Goal Self-Concordance and Success

Individuals can pursue their career future identities for want-to reasons that stem from the self (e.g., deep interest) as well as extrinsic or social-control related reasons that stem from outside the self (e.g., parental pressure). Self-concordance theory (Sheldon & Elliot, 1999), which builds on self-determination theory (Deci & Ryan, 2002), views the degree to which want-to (intrinsic or identified) reasons for pursuing a goal outweigh have-to (introjected or external) reasons for pursuing a goal (i.e., the degree of self-concordance) as crucial and beneficial for goal pursuit, goal achievement, and adaptation (Sheldon & Elliot, 1999).

Longitudinal studies from self-concordance research find that self-concordant goals are indeed positively associated with goal progress in a variety of domains, including work, education, and health (Bono & Judge, 2003; Judge et al., 2005; Koestner et al., 2008; Milyavskaya et al., 2015; Sheldon & Elliot, 1998, 1999; Sheldon & Houser-Marko, 2001; Werner et al., 2016). Specifically, in the work domain, self-concordant goals predict job satisfaction longitudinally (Judge et al., 2005). Similarly, in the education domain, semesterlong, self-concordant goals are positively associated with goal progress, goal effort, and reduced temptations (Milyavskaya et al., 2015; Sheldon & Elliot, 1998, 1999; Werner et al., 2016). To date, few studies have examined the relationship between self-concordance for career future identity and career success during the transition from university to work, arguably a time period where self-concordance may be key.

The Role of Pursuit: Career Goal Engagement and Success

Individuals can engage in their career future identities (e.g., by working long hours, asking their friends or mentors for advice, developing positive expectations, etc.), or they can disengage from them and activate self-protective attributions (e.g., by settling for the next best job, comparing themselves to less fortunate peers, etc.). The motivational theory of lifespan development (J. Heckhausen et al., 2010; J. Heckhausen, Wrosch, & Schulz, 2019) and other developmental regulation theories (Baltes, & Baltes, 1990; Brandtstädter & Renner, 1990; Haase et al., 2013) view goal engagement, which includes investing effort and time, asking others for help or seeking out other resources to overcome obstacles during goal pursuit, and avoiding distractions, increasing perceived control, and imagining positive outcomes related to goal attainment, as crucial for goal achievement and adaptation when opportunities for goal attainment are plentiful (J. Heckhausen et al., 2010; J. Heckhausen, Wrosch, & Schulz, 2018).

Empirical research finds that opportunity-congruent goal engagement is an important predictor of adaptation in a variety of domains (Brandtstädter & Renner, 1990; Freund & Baltes, 1998, 2002; Haase et al., 2008; Haase, Heckhausen, & Silbereisen, 2012; J. Heckhausen et al., 2010, 2019; Salmela-Aro, 2009; Wiese et al., 2002; Wrosch et al., 2006). In the work domain, there is empirical evidence that goal engagement and related constructs, such as self-efficacy, predict increased career or apprenticeship search effort, higher levels of apprenticeship attainment (for girls), and lower levels of unemployment (Haase et al., 2008; J. Heckhausen & Tomasik, 2002; Kracke, 2002; Nagy et al, 2005; Pinquart et al., 2003). While much of the past research has focused on the transition from high school to work in non-college bound youth, few studies to date have examined how goal engagement for a career future identity predicts career success during the transition from university to work.

Self-Concordance and Goal Engagement

A question that has received little attention in past research is how self-concordance and goal engagement are related over time. In other words, does motivation lead to pursuit or vice versa?

Popular lore often views motivation as a foundation for pursuit (O'Keefe, Dweck, & Walton, 2018), and there exists a large theoretical literature supporting this perspective. Specifically, the self-concordance model (Sheldon & Elliott, 1999) views self-concordance as a key predictor of goal engagement and empirical research on college students' goal selfconcordance and effort (Milyavskaya et al., 2015; Sheldon & Elliot, 1998; 1999; Werner et al., 2016) provides some support for this prediction. In a more general vein, most theoretical and empirical research from motivational psychology implicitly or explicitly assumes that the reasons (e.g., want-to or have-to) for pursuing a goal (i.e., motivational processes) take primacy over the motivational pursuit and strategies that individuals use in pursuing a goal (i.e., volitional processes). This emphasis shines through in these perspectives either considering only motivational processes, subsuming volitional processes within the construct of motivation, or theorizing a directional relationship where motivation leads to volition (e.g., Atkinson, 1964; Carver & Scheier, 1982; Deci & Ryan, 2002; Eccles & Wigfield, 2002; Elliott & Dweck, 1988; Emmons, 1986; Kasser & Ryan, 1996; Lewin, 1935; Little, 1983; Markus & Nurius, 1986; McClelland, 1965).

However, there also exists some limited support for the opposite view, namely that the two are both important for goal attainment or that pursuit builds motivation. Such "internalization" processes were already proposed by Allport (1937) who stated that "A student who at first undertakes a field of study in college because it is prescribed, because it pleases his

parents, or because it comes at a convenient hour, often ends by finding himself absorbed, perhaps for life, in the subject itself" (p. 201). More specifically and recently, the Rubicon model of action phases (H. Heckhausen & Gollwitzer, 1987) proposes that individuals become biased and passionate towards a goal once they cross the decisional Rubicon and form an intention to pursue a goal. This idea has been included in the motivational theory of life-span development (J. Heckhausen et al., 2010) to conceptualize individuals' cycles of deliberation, engagement and disengagement with developmental goals. Related views have appeared in some form in several theories (e.g., cognitive dissonance theory: Brehm & Cohen, 1962; Deci, Eghrari, Patrick, & Leone, 1994; Festinger, 1962; Harmon-Jones & Mills, 1999; Schafer, 1968), but have rarely been empirically tested.

Finally, there also exists some support for the view that motivation and pursuit are two sides of the same coin. Most prominently, Duckworth and colleagues (e.g., Duckworth, Peterson, Matthews, & Kelly, 2007) have treated motivation and pursuit as reflecting one underlying "grit" construct.

The Present Chapter

The present 4-wave, year-long longitudinal study of German university students transitioning from college graduation to their first job after college examined two research questions. First, we examined longitudinal associations between self-concordance and career success as well as longitudinal associations goal engagement and career success (i.e., career goal progress, career satisfaction, employment, and income). Building on past research (e.g., Bono & Judge, 2003; Haase et al., 2008), we hypothesized that both self-concordance and goal engagement would predict career success. Second, we investigated longitudinal associations between self-concordance and goal engagement. Building on theoretical and empirical evidence (e.g., Sheldon & Elliot, 1999), we examined whether self-concordance would predict goal engagement over time. At the same time, we also examined the reverse association with goal engagement predicting self-concordance building on motivational theory of lifespan development and related frameworks (e.g., J. Heckhausen et al., 2010, 2019). Analyses were controlled for gender, age, parental education, and major.

Last, I conduct two sets of supplementary analyses. The first set examines the relationship between want-to and have-to motivation as separate predictors of career success. This contrasts with the primary analyses that examined self-concordance (a composite measure of want-to motivation minus have-to motivation) as a predictor of career success. These analyses help to understand whether want-to or have-to motivation alone is positively associated with career success compared to the difference between want-to and have-to motivation. In addition, I also examined the relationship between want-to and have-to motivation and career goal engagement to examine whether goal engagement was associated with want-to and have-to motivation separately. Finally, the second set of supplementary analyses examines the three subscales that comprise the goal engagement measure as predictors of career success. These analyses help to understand what factor of goal engagement drives the relationship with career success.

Method

The present chapter uses data from a larger research project of which findings have been reported previously (Haase et al., 2013). This previous chapter (Haase et al., 2013) addressed none of the research questions examined here, with one exception (associations between goal engagement and career satisfaction were previously examined but not controlled for covariates).

Participants

Participants were 523 German university graduates (n = 361 females) recruited from four selected majors (medicine, n = 234; psychology, n = 79; architecture, n = 44; humanities, n =166) who had graduated in 2004 or 2005. Average age was 27.16 (SD = 2.73) years old at graduation. One year after graduation, 73.6% were working full-time and 26.4% were working part-time. Moreover, 72.2% had a partner at graduation, 75.5% had a partner one year after graduation, 12.2% were married at graduation, 5.0% were married one year after graduation, and 87.4% were childless one year after graduation. For regression-type analyses, an alpha level of .05, power of .95, and two-tailed testing, this sample size allowed for detecting small effects ($f^2 =$.02) (Cohen, 1992).

Procedure

The longitudinal design included four time points: graduation (T1), four months (T2), eight months (T3), and twelve months (T4) after graduation. 45% (n = 234) of participants took part in all four time points, 24.5% participated in three time points, 20.1% participated in two time points, and 10.7% participated in only one time point. Overall, 69.2% participated in at least three out of four time points, and this percentage is comparable to other longitudinal studies with adolescents (e.g., Vasalampi, Salmela-Aro, & Nurmi, 2009). All surveys were administered online. All variables were measured and examined at all four waves, except for employment and income, which were not assessed at graduation and examined here one year after graduation to yield a meaningful measure of success and take into account immense fluctuation in graduation and hiring cycles in Germany (where university graduation is not tied to the academic calendar year but can occur any time throughout the year).

Measures

Means and standard deviations for measures across the waves are reported in Table 2 - 1(for detailed methodological information, see Haase, 2007).

Self-concordance for career future identity. Self-concordance for a career future identity was measured by adapting the self-concordance measures used in past research for personal or semester-long goals (self-concordance [want-to motivation minus have-to motivation]: $\alpha = .58 - .69$) (Sheldon & Elliot, 1999). First, participants reported what career they wanted to do after college and then rated the importance of five different reasons for pursuing this career on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The two have-to reasons were "because somebody else wants me to or because the situation seems to compel it" and "because I would feel ashamed, guilty, or anxious if I did not have this goal" ($\alpha = .48 - .58$). The two want-to reasons were "because I really identify with it" and "because of the enjoyment or stimulation that this goal would provide me." From Little's research (Little, 1983) on personal projects, another autonomous reason was added (*"To what extent is this goal consistent with the values which guide your life?"*) measured on a scale from 1 (*not consistent at all*) to 10 (*completely consistent*) ($\alpha = .51 - .65$).

Goal engagement for a career future identity. Goal engagement for a career future identity were measured by a 13-item composite scale ($\alpha = .85 - .86$) that asked about investing effort towards career goal (e.g., selective primary control: "*I work hard to have a good occupational future.*"; 5 items; $\alpha = .83 - .84$), asking others for help to reach career goal (e.g., compensatory primary control: "*If my occupational future is in danger, I will seek help from acquaintances, friends, parents.*"; 4 items; $\alpha = .62 - .66$), and enhancing control beliefs about career goal pursuit (e.g., selective secondary control: "*When I think about my occupational*

future, I often tell myself that I will surely be successful. "; 4 items: $\alpha = .58 - .67$) on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) (J. Heckhausen et al., 2010). For supplementary analyses, I examined each subscale (selective primary control, selective secondary control, and compensatory primary control) as separate predictors of career success.

Career success. Career success was measured by four indicators. Career goal progress was measured with one item (*"To what extent have you been successful in pursuing your career goal so far?"*) on a scale from 1 (*strongly disagree*) to 10 (*strongly agree*) (adapted from Little, 1983). Career satisfaction was measured with one item (*"How satisfied are you with your career situation at this point?"*) from 1 (*strongly disagree*) to 10 (*strongly agree*) (adapted from Wanous, Reichers, & Hudy, 1997). One year after graduation, employment was measured with one item (*"Are you in gainful employment at the moment? [Gainful employment refers to any job that pays a salary including stipends, payed internships, etc.]) from 0 (<i>no*) to 1 (*yes*). Last, one year after graduation, income was measured with one item (*"What is your own monthly income after taxes?"*) on an open-ended scale that was recoded into a numerical variable.

Covariates. Gender (0 = male; 1 = female), employment opportunities (0 = favorable for *medicine and psychology*; 1 = unfavorable for architecture and humanities), and parental education (composite mean of mother's and father's education) were added as covariates. Examination of participants' employment status 1 year after graduation supported our coding of majors into favorable and unfavorable (see Haase et al., 2013 for more information). Parental education was measured with two items that asked each participant to report both their mother's and father's level of education (<math>1 = not graduated; 2 = graduated from lower school tier; 3 = graduated from middle school tier; 4 = graduated from higher school tier; 5 = graduated from higher school tier + university entrance certificate; 6 = other graduation). To create a composite
parental education measure, the scale was recoded (1 = 6 years; 2 = 8 years; 3 = 10 years; 4 = 13years; 5 = 13 years; 6 = missing), and an average between the two was taken.

Analysis Plan

First, we conducted a set of zero-order correlations between study variables across waves. To examine associations between self-concordance, goal engagement, career goal progress, and career satisfaction, we utilized cross-lagged models within a structural equation modeling framework (Kline, 2011). Cross-lagged models allow for a test of directionality in the relationship between constructs across time. In each cross-lagged model, stability paths, correlated changes, and cross-lagged effects were estimated (Kline, 2011), and the cross-lagged effects along with the correlated changes were constrained to be equal across time without loss of model fit following established procedures (Keijsers, Loeber, Branje, & Meeus, 2011; for more information on test of unconstrained versus constrained models, see Appendices A2 – 1). Model fit was assessed with χ^2 statistic, the comparative fit index (CFI; cutoff value: >.90), and the root mean square error of approximation (RMSEA; cutoff value: <.08) (Browne & Cudeck, 1993). Missing data was accounted for using full information maximum likelihood method (Arbuckle, Marcoulides, & Schumacker, 1996).

To provide an example, a cross-lagged model between self-concordance and career goal progress included a measure of these two constructs at each wave (see Figure 2 - 1). Paths between self-concordance and career goal progress at each wave were estimated and represent the correlated changes between the error of each construct (e.g., error from self-concordance at T1 was correlated with error from career goal progress as T1; error from self-concordance at T2 was correlated with error from career goal progress at T2, etc.). In addition, paths between either self-concordance or career goal progress at each wave were estimated (e.g., self-concordance at

T1 predicted self-concordance at T2; self-concordance at T1 predicted self-concordance at T3, etc.) and represent the stability paths. Next, paths between the either self-concordance and career goal progress at the earlier wave predicted either career goal self-concordance and career goal progress at subsequent waves (e.g., self-concordance at T1 predicted career goal progress at T2; career goal progress at T2 predicted self-concordance at T3, etc.). Finally, paths between covariates (gender, major, and parental education) and self-concordance and career goal progress at each wave were estimated as well as correlations between the errors of each covariate,

Next, to analyze associations with employment and income (assessed one year after graduation), I conducted multiple regression analyses (logistic regression analyses when predicting employment and linear regression analyses when predicting income). First, we predicted employment at T4 as a function of either self-concordance or goal engagement and covariates. Next, we estimated income at T4 as a function of either self-concordance or goal engagement and analyses were restricted to participants who were employed at T4 since income was dependent on employment.

Last, I conducted two sets of supplementary analyses. The first set examined the associations between either want-to or have-to motivation and each of the four career success indicators as well as the associations between either want-to and have-to motivation and career goal engagement. For this set, I first examined the zero-order correlation between want-to and have-to motivation across the waves. Next, I conducted six additional cross-lagged models that examined either want-to (or have-to) motivation as predictors of career goal progress (or career satisfaction or career goal engagement) controlling for gender, parental education, and type of major. Model fit was assessed with χ^2 statistic, the comparative fit index (CFI; cutoff value:

>.90), and the root mean square error of approximation (RMSEA; cutoff value: <.08) (Browne & Cudeck, 1993). Missing data was accounted for using full information maximum likelihood method (Arbuckle et al., 1996). In addition, like the primary analyses, cross-lagged paths were constrained to be equal across time. I then conducted four additional regressions that examined employment (or income) at T4 as a function of want-to (or have-to) motivation at T1 and control variables (gender, parental education, and type of major). Regressions with income as the dependent variable were restricted to participants who were employed at T4.

In the second set of supplementary analyses, I first conducted six additional cross-lagged models examining each subscale as a predictor of career goal progress (or career satisfaction) controlling for gender, parental education, and type of major. Model fit was assessed with χ^2 statistic, the comparative fit index (CFI; cutoff value: >.90), and the root mean square error of approximation (RMSEA; cutoff value: <.08) (Browne & Cudeck, 1993). Missing data was accounted for using full information maximum likelihood method (Arbuckle et al., 1996), and cross-lagged paths were constrained to be equal across time. Next, I conducted six additional regressions examining employment (or income) at T4 as a function of each subscale at T1 and the control variables (gender, parental education, and type of major). Regressions with income as the dependent variable were restricted to participants who were employed at T4.

Results

Preliminary Analyses

Table 2 – 1 shows the range of zero-order correlations across the waves between study variables (self-concordance, coal engagement, career goal progress, career satisfaction, employment [only T4], income [only T4], and covariates [only T1]).

Self-Concordance and Career Success

First, a cross-lagged model (Figure 2 – 1; see Appendix A2 – 2 for complete results) showed that self-concordance predicted longitudinal increases in career goal progress (B = .08, 95% CI [.03, .13], SE[B] = .02, $\beta = .05$, p = .001), whereas career goal progress did not predict changes in self-concordance (B = .02, 95% CI [-.02, .05], SE[B] = .02, $\beta = .03$, p = .43), controlling for covariates. Model fit was adequate ($\chi^2(12) = 33.79$, p = .001, CFI = .97, RMSEA = .06).

Second, the cross-lagged model (Figure 2 – 1; see Appendix A2 – 3 for complete results) showed that self-concordance predicted longitudinal increases in career satisfaction (B = .12, 95% CI [.07, .17], SE[B] = .03, $\beta = .16$, p < .001), whereas career satisfaction did not predict changes in self-concordance (B = -.04, 95% CI [-.11, .02], SE[B] = .03, $\beta = -.04$, p = .21), controlling for covariates. Model fit was good ($\chi^2(12) = 22.53$, p = .03, CFI = .99, RMSEA = .04).

Third, multiple regression analyses showed that self-concordance did not predict employment (B = .16, SE[B] = .14, OR = 1.18, 95% CI OR [0.90, 1.53], p = .23) or income (B = .01, 95% CI [-.03, .05], SE[B] = .02, $\beta = .02$, p = .69) at T4, controlling for covariates (see Appendix A2 – 4 in for complete results). In sum, higher self-concordance predicted increases in career goal progress and career satisfaction but not employment or income.

Goal Engagement and Career Success

First, a cross-lagged model (Figure 2 – 1; see Appendix A2 – 5 for complete results) showed that goal engagement predicted longitudinal increases in career goal progress (B = .52, 95% CI [.28, .76], SE[B] = .12, $\beta = .12$, p < .001), whereas career goal progress did not predict changes in goal engagement (B = .003, 95% CI [-.01, .01], SE[B] = .01, $\beta = .01$, p = .57),

controlling for covariates. Model fit was excellent ($\chi^2(12) = 5.98$, p = .92, CFI = 1.00, RMSEA < .001).

Second, a cross-lagged model (Figure 2 – 1; see Appendix A2 – 6 in for complete results) showed that goal engagement predicted longitudinal increases in career satisfaction (B = .23, 95% CI [.11, .35], SE[B] = .06, $\beta = .12$, p < .001), whereas career satisfaction did not predict changes in goal engagement (B = .02, 95% CI [-.01, .03], SE[B] = .01, $\beta = .02$, p = .37), controlling for covariates. Model fit was excellent ($\chi^2(12) = 14.27$, p = .28, CFI = 1.00, RMSEA = .02).

Third, multiple regression analyses showed that goal engagement at T1 positively predicted employment at T4 (B = .88, SE[B] = .38, OR = 2.42, 95% CI OR [1.16, 5.15], p = .02) but not income at T4 (B = .06, 95% CI [-.05, .16], SE[B] = .05, $\beta = .05$, p = .28), controlling for covariates (see Appendix 2 – 4 for complete results). In sum, these findings showed that goal engagement predicted increases in career goal progress and career satisfaction as well as employment one year later.

Goal Engagement and Self-Concordance

A cross-lagged model (Figure 2 – 2; see Appendix A2 – 7 for complete results) showed that self-concordance did not predict changes in goal engagement (B = .01, 95% CI [-.01, .03], $SE[B] = .01, \beta = .03, p = .18$), whereas goal engagement predicted increases in self-concordance (B = .21, 95% CI [.08, .35], $SE[B] = .07, \beta = .09, p = .002$), controlling for covariates. Model fit was excellent ($\chi^2(12) = 10.39, p = .58$, CFI = 1.00, RMSEA < .001). In sum, goal engagement predicted increases in self-concordance, but self-concordance did not predict goal engagement over time.

Supplementary Analyses

First, the range of zero-order correlations between want-to and have-to motivation across the waves was 0.05 to -0.38. Second, two separate cross-lagged models showed that want-to motivation did not predict career goal progress (B = .03, 95% CI [-.004, .06], SE[B] = .02, $\beta =$.01, p = .09) or career satisfaction (B = .04, 95% CI [-.02, .10], SE[B] = .03, $\beta = .03$, p = .19). Model fit for both models was adequate (want-to motivation and career goal progress: $\chi^2(12) =$ 30.92, p = .002, CFI = .97, RMSEA = .06; want-to motivation and career satisfaction: $\chi^2(12) =$ 42.11, p = .001, CFI = .96, RMSEA = .07). In addition, multiple regression analyses showed that want-to motivation at T1 did not predict employment (B = .30, SE[B] = .22, OR = 1.35, 95% CI OR [.07, 2.06], p = .17) or income (B = .02, 95% CI [-.04, .09], SE[B] = .03, $\beta = .03$, p = .51) at T4.

Next, a cross-lagged model found that have-to motivation negatively predicted career goal progress (B = -.05, 95% CI [-.08, -.02], SE[B] = .02, $\beta = -.02$, p = .003) and career satisfaction (B = -.80, 95% CI [-.14, -.02], SE[B] = .03, $\beta = -.07$, p = .008) such that those who reported pursuing their career future identity because of external pressure or feelings of guilt and anxiety were less likely to report they had progressed towards their career future identity and felt satisfied with it. Model fit was adequate for both cross-lagged models (have-to motivation and career goal progress: $\chi^2(12) = 25.99$, p = .01, CFI = .98, RMSEA = .05; have-to motivation and career satisfaction: $\chi^2(12) = 31.51$, p = .002, CFI = .98, RMSEA = .06). However, multiple regression analyses show that have-to motivation at T1 did not predict employment (B = -.19, SE[B] = .22, OR = .83, 95% CI OR [.55, 1.29], p = .39) or income (B = .0009, 95% CI [-.05, .06], SE[B] = .03, $\beta = .001$, p = .98) at T4. In sum, these results show that have-to motivation negatively predicted subjective measures of career success but not objective measures while want-to motivation did not predict either subjective or objective measures of career success.

Finally, to tease apart the association between goal engagement and self-concordance in the primary analyses, two cross-lagged models between want-to motivation and goal engagement and have-to motivation and goal engagement were conducted. Results found that career goal engagement positively predicted want-to motivation (B = .17, 95% CI [.08, .25], $SE[B] = .05, \beta = .11, p < .001$) but did not predict have-to motivation (B = .08, 95% CI [-.16, .01], $SE[B] = .04, \beta = -.05, p = .07$). Model fit was excellent for both models (goal engagement and want-to motivation: $\chi^2(12) = 10.93, p = .54$, CFI = 1.00, RMSEA = .001; goal engagement and have-to motivation: $\chi^2(12) = 18.24, p = .11$, CFI = 1.00, RMSEA = .03). Therefore, a relationship between goal engagement and want-to motivation exists but not for goal engagement and have-to motivation.

In the second set of supplementary analyses, I investigated the subscales (selective primary control, selective secondary control, and compensatory primary control) of goal engagement as predictors of career success. First, two separate cross-lagged models found that selective primary control (i.e., investing time, effort, and resources towards one's career future identity) did not predict career goal progress (B = -.002, 95% CI [-.02, .02], SE[B] = .01, $\beta = -.001$, p = .86) or career satisfaction (B = -.007, 95% CI [-.05, -.03], SE[B] = .02, $\beta = -.004$, p = .74). Model fit for both models was good (selective primary control and career goal progress: $\chi^2(12) = 20.21$, p = .06, CFI = .98, RMSEA = .04; selective primary control and career satisfaction: $\chi^2(12) = 24.72$, p = .02, CFI = .99, RMSEA = .05). However, regression analyses showed that selective primary control positively at T1 predicted employment (B = .79, SE[B] = .31, OR = 2.20, 95% CI (OR [1.22, 4.11], p = .01) but not income (B = .03, 95% CI [-.05, .12],

 $SE[B] = .04, \beta = .04, p = .48$) at T4 such that students who invested more time, effort, and resources towards their career future identity at graduation were more likely to be employed one year later.

Next, two separate cross-lagged models found that compensatory primary control (i.e., asking others for help) positively predicted career goal progress (B = .02, 95% CI [.003, .04], $SE[B] = .01, \beta = .01, p = .03$) but not career satisfaction (B = .04, 95% CI [-.008, .08], $SE[B] = .02, \beta = .02, p = .11$) such that students who reported be willing to ask others for help during pursuit of their career future identity were more likely to report higher progress towards it but not higher satisfaction. Model fit for both models was good (compensatory primary control and career goal progress: $\chi^2(12) = 16.48, p = .17, CFI = .99, RMSEA = .03$; compensatory primary control and career satisfaction: $\chi^2(12) = 17.77, p = .12, CFI = .99, RMSEA = .03$). Moreover, regression analyses showed that compensatory primary control at T1 did not predict either employment (B = .41, SE[B] = .32, OR = 1.51, 95% CI OR [.79, 2.84], p = .20) or income (B = .04, 95% CI [-.04, .13], $SE[B] = .04, \beta = .05, p = .35$) at T4.

Last, two separate cross-lagged models found that selective secondary control (i.e., increasing one's expectations towards the career future identity, avoiding distractions, etc.) did not predict career goal progress (B = -.008, 95% CI [-.03, .01], SE[B] = .01, $\beta = -.003$, p = .45) or career satisfaction (B = .001, 95% CI [-.04, .04], SE[B] = .05, $\beta = .001$, p = .98). Model fit for both models was adequate (selective secondary control and career goal progress: $\chi^2(12) = 23.44$, p = .02, CFI = .99, RMSEA = .03; selective secondary control and career satisfaction: $\chi^2(12) = 24.17$, p = .02, CFI = .99, RMSEA = .04). Moreover, regression analyses showed that selective secondary control at T1 did not predict employment (B = .61, SE[B] = .31, OR = 1.83, 95% CI

OR [.99, 3.43], p = .05) or income (*B* = .04, *95% CI* [-.04, .12], *SE*[*B*] = .04, β = .05, *p* = .33) at T4.

Overall, these second set of supplementary analyses find no single subscale of goal engagement is driving the results between goal engagement and career success. Instead, results find that investing time, effort, and resources is positively associated with employment whereas asking others for help is positively associated with reported progress.

Discussion

The present 4-wave longitudinal study followed 523 university graduates during the first year after graduation and yielded two key findings. First, both self-concordance and goal engagement for a career future identity were important predictors of a successful transition into work. Second, goal engagement predicted increases in self-concordance over time, but not vice versa. All analyses were controlled for gender, age, parental education, and type of major. Thus, both motivation and pursuit mattered for career success; but only pursuit predicted motivation over time, not vice versa.

Motivation and Pursuit: Both Matter for Career Success

Motivation and pursuit for a career future identity both emerged as important predictors of career success. Specifically, self-concordance (i.e., higher levels of identification with and interest in a career future identity over external pressure or guilt for pursuing a career future identity) predicted increases in perceived progress towards one's career and career satisfaction. These findings converge with theoretical predictions and past studies on goal self-concordance across a variety of domains (Milyavskaya et al., 2015; Sheldon & Elliot, 1998, 1999; Werner et al., 2016), which showed that goals pursed for more want-to compared to have-to reasons lead to increased goal attainment. In addition, these findings are comparable to research on passion as a predictor of success in the workplace (e.g., Vallerand & Houlfort, 2003).

In the supplementary analyses investigating want-to and have-to motivation as separate predictors of career success, results found that have-to motivation negatively predicted subjective but not objective career success such that students who pursue their career because of feelings of pressure, anxiety, or guilt are more likely to experience decreases in their level of satisfaction with their career and their reported progress towards it. Meanwhile, want-to motivation did not predict either objective or subjective indicators of career success. These results underscore how self-concordance (the difference between want-to and have-to motivation), want-to motivation, and have-to motivation are uniquely predictive of career success, and it is possible from this supplementary analysis that have-to motivation is particularly demotivating during this developmental transition. Future research should continue to investigate want-to and have-to motivation separately and together, and this is highlighted by the correlations between want-to and have-to motivation which ranged from uncorrelated (r = .0) to moderately correlated (r = .3).

Moreover, goal engagement for a career future identity (i.e., investing time and effort, asking others for help, and boosting one's expectations, values, and control beliefs) predicted increases in how much progress individuals perceived towards their career goals, how satisfied they were with their career, and, over and above these subjective aspects of success, whether they were employed one year later. These findings support predictions by the motivational theory of lifespan development (J. Heckhausen et al., 2010) and related frameworks (e.g., Haase et al., 2013). Moreover, they extend past research which heavily investigated career goal engagement during the search for an apprenticeship (e.g., Haase et al., 2008; J. Heckhausen & Tomasik, 2002) to demonstrate effects on actual employment one year after graduation.

The supplementary analyses examining the subscales of goal engagement ultimately showed that no single subscale is driving the results between goal engagement and subjective and objective career success. Investing time, effort, and energy towards one's career predicted actual employment while asking others for help predicted level of progress. In addition, increasing one's motivation, value, and control beliefs did not predict either subjective or objective career success. These results are suggestive that the primary control beliefs central to the pursuit pathway in AMP drive the relationship between goal engagement and career success (i.e., selective primary control [i.e., investing time, resources, and effort] predicts employment and compensatory primary control [i.e., asking others for help] predicts career goal progress). Future research should continue to investigate the subscales of goal engagement to understand under which conditions each subscale is associated with goal progress and achievement.

Given the central importance of employment (cf. Jahoda, 1981) for longer-term career success, personality development, social relationships, and health (e.g., Morris, Cook, & Shaper, 1994; Roberts, Walton, Bogg, & Caspi, 2006; Schoon & Silbereisen, 2009; Schulenberg, Bryant, & O'Malley, 2004; Shulman & Nurmi, 2010), the present findings emphasize the importance of pursuit for a successful transition into work. At the same time, career goal progress and satisfaction are important subjective transition outcomes (also with important long-term effects; [e.g., Dirlam & Zheng, 2017]), and these outcomes were predicted by both pursuit and motivation. Interestingly, neither motivation nor pursuit predicted the amount of money earned one year after graduation. After all, it is likely that decisions earlier in a students' college career, such as their major, impacted how much money they earned after graduation (and zero-order correlations between major and income one year after graduation [r = .66] showed that students

83

in majors with better job prospects were much more likely to be earning more compared to students in majors with worse job prospects).

Because motivation (and pursuit) predicted career success, I wanted to understand what leads an individual who is very passionate about their career future identity or invests a lot of time and resources to reach it to be more likely to experience career success. In other words, what leads motivation and pursuit to impact achievement? Considering this question, I theorized what proximal mechanisms of achievement may be important in explaining the relationship between motivation (and pursuit) and career success. One potential and important mechanism that may explain this relationship is self-control, or the decision to choose the goal-directed behavior versus the tempting one. This led to the development of the AMP process discussed in Chapter 1 and specifically whether motivation and pursuit for a future identity represent key inputs for self-control decisions.

Pursuit over Motivation?

This study also showed that pursuit predicted increases in motivation but not vice versa. Specifically, goal engagement predicted increases in self-concordance, but self-concordance did not predict goal engagement. In other words, an individual who invests time and resources, believes they can succeed, and reaches out to others for help was associated with either increases in identification and interest with their career future identity or a decrease in perceptions of external pressures or anxiety surrounding it.

These findings do not support popular lore and theoretical predictions of the selfconcordance model (Sheldon & Elliot, 1999) and other motivational frameworks in general (e.g., Atkinson, 1964; Deci & Ryan, 2002; Eccles & Wigfield, 2002; Elliott & Dweck, 1988) that extol the primacy of motivation, especially motivation towards goals, over volitional processes. Instead, this study suggests that individuals who pursued their career future identities even though they initially lacked interest in it or did so because of external pressure from family and friends, were more likely to experience increases in self-concordance with them over time if they put effort, time, and resources towards that them.

These findings are corroborated by the motivational theory of lifespan development (J. Heckhausen et al., 2010; 2019) which argues that once an individual transitions from a motivational mindset (e.g., choosing goal) to a volitional mindset (e.g., planning and acting on goal) they will become biased and increase their positivity towards the goal. It is likely that a student, after graduation when it is necessary to attain a job, adopts a volitional mindset and increase their pursuit which, in turn, increases their motivation for their career future identity because they are working hard to attain it. Future research should continue to investigate the interrelationship between motivation and pursuit and examine whether pursuit is predictive of passion in other contexts, such as education or health, and across different developmental periods.

In addition, the supplementary analyses discovered that pursuit, or goal engagement, positively predicted want-to motivation but did not predict have-to motivation. This suggests that investment towards a goal increases one's level of identification and interest with the career future identity but does not change feelings of pressure, anxiety, or guilt. In other words, students' level of effort exerted towards their careers was associated with greater feelings of importance and enjoyment with it while making the transition from college graduation to their first job. Future research should consider the relationship between pursuit and motivation bidirectional and investigate pursuits impact on both want-to and have-to motivation.

Strengths and Limitations

The present study has several strengths, including the (a) use of a 4-wave longitudinal design; (b) examination of a sizable sample; and (c) a life-span transition with high ecological validity. The study also has several limitations in that we only examined the first year after graduation from university in one specific country (i.e., Germany). Future research may examine generalizability of the present findings during different workforce scenarios (e.g., before/after job promotions, unemployment-to-employment, etc.); during the transition to employment in students pursuing non 4-year college degrees; and in other countries (e.g., Shane & Heckhausen, 2013). For example, students who do not pursue a 4-year college degree may be more likely to choose careers to earn money rather than for self-actualization, and therefore, motivation may be less meaningful for their career success. In addition, motivation and pursuit may operate differently in different countries (Schoon & Silbereisen, 2009). For instance, in Italy, increased education is associated with greater risk of unemployment because Italy's economy includes less job opportunities for college graduates; thus, motivation may play a smaller role in predicting career success.

Implications for Future Research and Applications

Given the importance of the transition into work for long-term development (e.g., Roberts et al., 2006; Schulenberg et al., 2004), it is important to understand what predicts transition success. Researchers across disciplines have examined predictors ranging from the macro (e.g., Von Wachter & Bender, 2006) to the micro. Drawing from motivational frameworks (Sheldon & Elliott, 1999; J. Heckhausen et al., 2010), the present study zoomed in on two motivational constructs that have rarely been examined together: self-concordance and goal engagement. Future research may probe generalizability of the present findings (e.g., across other transitions), elucidate mechanisms (e.g., to explain why pursuit predicts motivation), behaviors (e.g., to understand what exactly graduates do in their daily lives while pursuing their career future identity), and outcomes beyond career success (e.g., well-being, health). AMP may serve as a framework to test what exactly graduates do in their daily lives to pursue their career since AMP argues that perceived value represents the key mechanism through which future identities impact daily self-control.

The present findings also have implications for counseling and interventions. In terms of counseling, colleges and universities may develop career development programming that emphasizes the importance of motivation and, perhaps even more so, pursuit. Moreover, to help with objective career success, colleges and universities may share information on employment and salary statistics associated with majors since type of major was highly correlated with income one year after graduation. In terms of interventions, more research is needed to examine the effects of motivational programs that target not only why (e.g., Hulleman & Harackiewicz, 2009) but also how individuals engage with their career future identities. It is possible that helping students develop plans to reach their goal, enact those plans, and believe they have what it takes will prove very fruitful. An example of an intervention that targets volitional constructs are implementation intentions interventions (Gollwitzer, 1999) which help students to develop "if-then" statements so that they have plans to overcome obstacles or temptations during their goal pursuit. These interventions are found to have robust effects, particularly in the health domain (Gollwitzer & Sheeran, 2006). Future research should investigate the impact of similar pursuit related interventions on motivation outcomes in the education domain.

Conclusion

The present study examined the yearlong associations between motivation (measured by selfconcordance) pursuit (measured by goal engagement) for a career future identity and career success in a sample of German university students making the transition from school-to-work. The present findings highlight the importance of both motivation and pursuit to ensure success during this key developmental transition and emphasize how simply exerting effort and time, activating help, and keeping your eye on the prize can increase identification with one's career future identity.

Chapter 3: Want-to Versus Have-to Motivation and Self-Control in a Learning Context

Introduction

Self-concordance theory (Sheldon & Elliot, 1999) hypothesizes that individuals who pursue goals for more want-to reasons (i.e., because one is interested in and identifies with their goal) compared to have-to reasons (i.e., because one is pressured by others or would feel anxious or guilty if they did not) experience more goal progress and attainment and also experience less temptations and obstacles during goal pursuit (Milyavskaya et al., 2015; Sheldon & Elliot, 1998, 1999; Sheldon & Houser-Marko, 2001; Svoboda et al., under review; Werner et al., 2016). However, only one study to date has investigated the experimental impact of want-to versus have-to reasons on goal progress (Leduc-Cummings et al., 2017). In that study, individuals were asked to write about either why they want-to to eat healthy or why they have-to eat healthy, and results found that individuals who wrote about want-to reasons compared to have-to reasons reported less perceived obstacles towards goal attainment. The current chapter extends past research, including Chapter 2, on want-to versus have-to reasons by investigating the causal impact of these reasons on self-control in an educational learning context and measuring a key mediator, perceived value, between reasons and self-control. The present study assesses motivation instead of pursuit even though in Chapter 2 pursuit predicted motivation because of the extensive past research on motivation (e.g., Dweck & Elliot, 1988; Eccles & Wigfield, 2002; Wigfield & Cambria, 2010).

To understand self-control, it is essential to measure it as it would occur in real-life, and the majority past research has investigated self-control either using a self-reported measure of achievement, a working memory test, or a persistence task (Galla et al., 2014; Lurquin & Miyake, 2017). In the present chapter, self-control is measured in a realistic, online learning context that college pre-medical students would naturally find themselves in countless times throughout their college career. Specifically, pre-medical students are confronted with a self-control dilemma where they must choose to either study for an upcoming MCAT quiz or interact with popular online content (i.e., *Buzzfeed* quizzes and *Instagram* videos). Therefore, the present study is one of the few studies that creates an accurate self-control dilemma (e.g., Galla et al., 2014). Even more, the present chapter provides a full test of AMP by measuring perceived value as the mediator between motivation and self-control. Past research has rarely studied the potential mechanisms undergirding the association between antecedents of self-control and actual self-control, and as others have noted (e.g., Berkman et al., 2016; Lurquin & Miyake, 2017), this remains a limitation of self-control research. Moreover, research on want-to and have-to reasons is plagued by similar limitations in understanding what mechanisms drive the relationship between want-to or have-to reasons and goal progress and attainment (Milyavskaya & Werner, 2019).

Altogether, the present chapter extends past research by investigating self-control in a real-world context, testing self-control more accurately, and assessing a potential mechanism. Even more, this chapter provides a direct test of the motivation pathway in AMP. Specifically, it examines whether motivation can be momentarily changed and if this change has a downstream effect on the hypothesized perceived values (attainment, intrinsic, and utility value) as well as self-control as it is conceptualized to occur (a choice between a goal-directed behavior and a self-control one). Thus, the present chapter can assess whether motivation increases self-control through a boost in perceived value for the goal-directed behavior.

Present Chapter

The present chapter assesses the causal effect of want-to and have-to career future identities on self-control in a pre-medical learning context. In addition, the present chapter also investigates perceived task value as mediator between experimental condition and self-control. Specifically, participants were randomly assigned to one of three conditions (want-to, have-to, or control) where they were asked to reflect on and write about either their want-to reasons for becoming a doctor, have-to reasons for becoming a doctor, or neither. Afterwards, participants completed a study session prior to taking a 25-question Medical College Admission Test (MCAT) quiz, and before both the study session and MCAT quiz, participants reported their perceived task value for each activity. In the study session, participants had the choice of interacting with popular web content or completing 10 practice MCAT questions. Self-control was measured by the number of temptations students clicked during the study session as well as time spent on the study session and MCAT quiz. Thus, the main dependent variables were selfcontrol along with achievement on study session and MCAT quiz. Achievement was an outcome of interest because it has been measured extensively in past research on want-to and have-to motivation (Milyavskaya et al., 2015; Sheldon & Elliot, 1999). Other dependent variables included self-reported goal progress, effort, and obstacles towards becoming a doctor since past research measures self-control using these measures as well (e.g., Milyavskaya et al., 2015; Werner et al., 2016).

Overall, I hypothesized that participants in the want-to condition compared to those in the have-to and control condition would click less temptations, spend more time on the study session, score better on the study session and MCAT quiz, report higher progress and effort, and report lower obstacles. In addition, I hypothesized that perceived task value, measured by

attainment, intrinsic, and utility value, would mediate the relationship between experimental condition and the outcomes such that participants assigned to the want-to condition will click less temptations during the study session, spend more time on the study session, and perform better on the study session because of increased attainment, intrinsic, and utility values for the study session. I did not hypothesize a difference in outcomes between the have-to and control conditions.

I expected asking participants to write about their want-to reasons versus have-to reasons or neither would lead to higher perceived value and self-control for two reasons. First, as mentioned earlier, in past research (Leduc-Cummings et al., 2017), reflecting on want-to reasons compared to have-to reasons led individuals to perceive less obstacles towards goal pursuit, and the current study utilizes a similar experimental manipulation to help students attend to one set of reasons over the other for a short period of time. Moreover, broader social psychological manipulations (e.g., utility value: Hulleman & Harackiewicz, 2009; belonginess: Walton & Cohen, 2011, etc.) find impacts on outcomes when students reflect and write about different aspects of their motivation and identity. Last, a broader point: social psychological theory (Walton & Wilson, 2019) centers on the role that context plays in shaping individual's meanmaking of themselves and their broader situation. Therefore, a tenet of social psychological theory is that these interpretations individuals hold about themselves and their environment can be changed by external factors such as an experimental manipulations. The present chapter seeks to change individuals' interpretations of why they want to become a doctor and examine if this has downstream effects on their perceived value and self-control. At the same time, it is possible that motivation may be hard to change through short-term writing manipulations because motivation towards a future identity is tied deeply to an individual's core self.

In addition to these analyses, I also conducted a set of quantitative and qualitative exploratory analyses. Quantitative analyses included examining moderation by parental education to assess whether the effect of the conditions on outcomes varied by parents' education level. Qualitative analyses included coding the written responses from the experimental conditions first for adherence to the instructions (treatment fidelity) and second for certain themes (e.g., authenticity, tone, affect, etc.) that could explain the (in-)effectiveness of the experimental manipulation.

Methods

Participants

134 participants completed a 25-minute online study through Qualtrics survey software. 23 participants were removed from analyses for either failing attention checks or spending 40 or more minutes on the study. The final working sample included 111 pre-medical students (73% female; 22% freshman, 27% sophomores, 30% juniors, 21% seniors; Age: M = 19.60, SD =1.19) enrolled at a mid-sized, private university in the Midwest. Participants were recruited through advertisements posted to pre-medical course websites and pre-medical Facebook groups, emails to pre-medical student groups, and flyers posted around campus buildings. Participants were paid \$15 for completing the study.

Procedure

Participants were sent a study link via email. After clicking the link, participants were consented, introduced to the study, and told that they would be completing a writing exercise about becoming a doctor, answering MCAT questions, and receiving their final score on the MCAT quiz at the end of the study. In this introduction, participants also were told that prior

research has found that students who take part in MCAT practice quizzes get better MCAT scores. This was included to emphasize the importance of the study for the participants. After this introduction, participants were randomly assigned to one of three conditions: want-to, have-to, and control. Each condition asked participants to write a few sentences over the next three minutes; after the three minutes, participants could move forward at any time.

In the want-to condition, participants responded to a prompt that asked them to consider why they want-to become a doctor and to write about want-to reasons that are specific to them. In the have-to condition, participants responded to a prompt that asked them to consider why they have-to become a doctor and to write about have-to reasons that are specific to them. Finally, in the control condition, participants responded to a prompt that asked them to write about how they spent the day yesterday in a factual and unemotional way. The three prompts are included below:

Want-to Prompt

We would like **YOU** to think about all the reasons why you **WANT TO** become a doctor. Examples of **WANT TO** reasons include:

- Because becoming a doctor is important to you and who you want to be in the future
- Because you would feel excited, proud, or happy if you became a doctor
- Because you would lose part of who you are if you did not pursue becoming a doctor
- Because you like the challenge and adventure becoming a doctor would provide if you reached it

On the next page, please take at least 3 minutes to write a short paragraph (a few sentences) on the WANT TO reasons for why you want to become a doctor. You can choose to write about as many WANT TO reasons as you would like -- just make sure they are specific to you. After 3 minutes on the screen, you can move forward by pressing arrow at bottom.

Have-to Prompt

We would like YOU to think about all the reasons why you **HAVE TO** pursue this future career. Examples of **HAVE TO** reasons include:

- Because you feel pressured to pursue becoming a doctor by other people or circumstances
- Because you want to impress other people, like your parents, friends, or teachers, by becoming a doctor
- Because you would feel ashamed, guilty, or anxious if you did not become a doctor
- Because you would receive recognition and praise from other people, like your parents, friends, or teachers, if you became a doctor

On the next page, please take at least 3 minutes to write a short paragraph (a few sentences) on the HAVE TO reasons for why you want to become a doctor. You can choose to write about as many HAVE TO reasons as you would like -- just make sure they are specific to you. After 3 minutes on the screen, you can move forward by pressing arrow at bottom.

Control prompt

On the next page, we would like **YOU** to take at least **3 minutes** to write a short paragraph (a few sentences) about how you spent your day yesterday. Describe how you spent your time as factually and unemotionally as possible from the time you got up in the morning until the time you went to sleep in the evening. Please be as detailed as possible. After 3 minutes on the screen, you can move forward by pressing arrow at bottom. A sample of responses from each prompt are included in Appendix A3 – 1. Following the experimental manipulation, participants were given specific instructions for the upcoming study session and reported their perceived values for the study session. The study session lasted three minutes; afterwards, participants could move forward at any time. In the study session, participants could either answer ten practice MCAT questions or read popular website articles (e.g., Buzzfeed: *What state do you actually belong?*) and watch videos (e.g., Instagram: *Donut glazing video*) by clicking on links for them. Appendix A3 – 1 includes an example of the study session. Once participants completed the study session, they were informed about the MCAT quiz and reported their perceived task values for the MCAT quiz. The MCAT quiz lasted five minutes and included 25 MCAT questions. Participants could move forward at any time after five minutes. After the MCAT quiz, participants reported their self-reported goal progress, effort and obstacles towards becoming a doctor as well as dispositional measures of want-to and have-to motivation for their medical career. Last, participants completed demographic measures and received their score on the MCAT quiz.

Measures

Summary statistics for key study variables overall and by condition are reported in Table 3-1.

Time spent on study session. Time spent on study session was recorded by Qualtrics and represents the time spent in seconds by participants from when they started the study session to when they clicked to move forward. Participants controlled the amount of time spent on the study session and, therefore, this measure represents a more accurate self-control measure compared to common self-reported measures used in past research (Friese et al., 2018). Number of temptations during study session. Temptations was recorded by Qualtrics if the participant clicked on the link to the article or video. The final temptation measure was created by totaling the number of temptations clicked by the participants during the study session. Number of temptations clicked also represents a more accurate measure of self-control since it records participants' likelihood of choosing the tempting behavior over the goal-directed which is an accurate reflection of how self-control is theorized to occur (Friese et al., 2018).

Performance on study session. Performance on the study session was measured by the total the number of correct answers participants chose out of the 10 questions.

Perceived task values during study session. Perceived task value included three measures: attainment, intrinsic, and utility value (Wigfield & Cambria, 2010). Attainment value was measured by three items (e.g., "*I want to do a good job studying for the upcoming MCAT quiz*.") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) (α = .88). Intrinsic value was measured by two items (e.g., "*I think studying for the upcoming MCAT quiz will be fun.*") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) (α = .95). Utility value was measured by two items (e.g., "*I think studying for the upcoming MCAT quiz will be fun.*") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) (α = .95). Utility value was measured by two items (e.g., "*I think studying for the upcoming MCAT quiz will be useful.*") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) (α = .77).

Time spent on the MCAT quiz. Time spent in seconds on the MCAT quiz was recorded by Qualtrics and represents the time spent in seconds by participants from when they started the MCAT quiz to when they clicked to move forward.

Performance during the MCAT quiz. Performance on the MCAT quiz was measured by the total the number of correct answers participants chose out of 25 questions.

Perceived task values during the MCAT quiz. Perceived task value included three measures: attainment, intrinsic, and utility value (Wigfield & Cambria, 2010). Attainment value

was measured by three items (e.g., "*I want to do a good job on this MCAT quiz.*") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) ($\alpha = .87$). Intrinsic value was measured by two items (e.g., "*I think this MCAT quiz will be fun.*") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) ($\alpha = .97$). Utility value was measured by two items (e.g., "*I think this MCAT quiz will be useful.*") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) ($\alpha = .85$).

Goal progress, effort, and obstacles. Goal progress was measured with two items (e.g., "Over the past 6 weeks, I feel like I am on track to become a doctor") on a scale from 1 (strongly disagree) to 7 (strongly agree) (α = .83) (Milvayskaya et al., 2015). Effort was measured with one item ("Over the past 6 weeks, I have tried really hard to become a doctor.") on a scale from 1 (strongly disagree) to 7 (strongly agree). Obstacles were measured with one item ("Over the past 6 weeks, I encountered obstacles to achieving my goal of becoming a doctor.") on a scale from 1 (strongly disagree) to 7 (strongly agree).

Covariates. Age, gender (1 = female), high school test score, and parental education were included as covariates. Participants were given the option to report either their SAT or ACT score from high school. A composite test score was created by first z-score transforming both SAT and ACT score separately then combining the two. A composite of parental education was created by averaging mother's education level and father's education level on a scale from 1 (*grade school*) to 6 (*graduate school*).

Analysis Plan

Confirmatory analyses. Confirmatory analyses included three separate steps. First, I conducted zero-order correlations between key study variables. Second, I conducted a set of multiple regressions to examine the effect of experimental conditions (dummy coded with want-to condition as reference group) on all outcomes (perceived values for study session, study

session outcomes, perceived value for MCAT quiz, MCAT quiz outcomes, and self-reported progress, effort, and obstacles). Covariates included age, gender, high school test score, and parental education. Last, I conducted two separate structural equation models (SEM) to assess the indirect effect of experimental condition on outcomes through perceived task values. The first model assessed the relationship between experimental condition, perceived task values for the study session, time spent on the study session, temptations clicked during the study session, and performance on the study session. The second model assessed the relationship between experimental condition, perceived task values for the MCAT quiz, time spent on MCAT quiz, and performance on MCAT quiz. The same covariates from the regression analyses were included in these SEM models. Model fit was assessed with χ^2 statistic, the comparative fit index (CFI; cutoff value: >.90), and the root mean square error of approximation (RMSEA cutoff value: <.08) (Browne & Cudeck, 1993). Missing data was accounted for using full information maximum likelihood method (Arbuckle et al., 1996).

Exploratory analyses. Three sets of exploratory analyses were conducted as well. First, I conducted a set of moderated regressions to examine the effect of want-to versus have-to condition (1 = want-to condition, -1 = have-to condition) on outcomes by parental education level (1 = college or higher; -1 = no college). No covariates were included in these analyses. Second, I qualitatively coded the written responses in two ways. To assess participants' adherence to the treatment instructions, or treatment fidelity, two independent coders blind to condition coded the written responses in the want-to and have-to conditions for whether participants wrote about only want-to reasons for becoming a doctor, have-to reasons, both, or no reasons. Once agreement was reached across all responses, we assessed the outcomes of interest as a function of this treatment fidelity code (1 = want-to; 0 = have-to) and covariates using linear

regression to examine whether outcomes varied by what reasons participants wrote about regardless of assigned condition.

Last, I used Linguistic Inquiry and Word Count (LIWC) software (Penneebaker, Francis, & Booth, 2015) to examine the prevalence of word types across sixteen specific categories. The categories I assessed include: word count, authenticity, tone, affect, positive emotion, negative emotion, work, money, family, friend, risk, reward, present focused, past focused, and future focused. LIWC software outputs a variable that gives the total number of words that fall into each category. To assess differences between number of words from each category by want-to versus have-to condition, I first examined each category as a function of want-to versus have-to condition, 1 = want-to condition) using linear regression. No covariates were included in these analyses.

After identifying statistically significant differences in four LIWC categories, I assessed whether these statistically significant categories mediated the relationship between want-to versus have-to condition (0 = have-to condition, 1 = want-to condition) and our outcomes of interest in three separate SEM. The first model assessed the relationship between want-to versus have-to condition, the statistically significant word categories, and outcomes for the study session (time spent on the study session, temptations clicked during the study session, and performance on the study session). The second model assessed the relationship between the want-to versus have-to condition, the statistically significant word categories, and MCAT quiz outcomes (time spent and performance on MCAT quiz). The last model assessed the relationship between the relationship between the want-to versus have-to condition, the statistically significant word categories, and self-reported goal progress, effort, and obstacles. Model fit was assessed with χ^2 statistic, the comparative fit index (CFI; cutoff value: >.90), and the root mean square error of approximation

(RMSEA; cutoff value: <.08) (Browne & Cudeck, 1993). Missing data was accounted for using full information maximum likelihood method (Arbuckle et al., 1996).

Results

Confirmatory Analyses

Zero-order correlations. Zero-order correlations between key study variables are reported in Table 3 - 2.

Multiple regressions. Results from the multiple regressions found that the experimental conditions were statistically significantly different on reported obstacles F(2, 104) = 4.08, p = 0.02) such that the want-to condition reported lower obstacles to becoming a doctor compared to both the have-to condition (B = 0.85, 95% *CI* [0.13, 1.57], *SE*[*B*] = 0.36, $\beta = .26$, p = 0.02) and control condition (B = 0.72, 95% *CI* [0.02, 1.42], *SE*[*B*] = 0.35, $\beta = 0.23$, p = 0.04) (Figure 3 – 1). Thus, participants who were prompted to think about their want-to reasons reported perceiving fewer obstacles to becoming a doctor over the last six weeks compared to participants who were prompted to think about their have-to reasons or the past days' events. No other results were statistically significant; participants' self-control and perceived task values did not differ by condition. Results from all multiple regressions conducted are reported in Appendix A3 – 2.

SEM. The first SEM examined the relationship between experimental condition, perceived task values for the study session, and study session outcomes (time spent, number of temptations clicked, and performance). Model fit was adequate ($\chi 2(8) = 9.97$, p = 0.27, CFI = 0.99, RMSEA = 0.05). Results found one statistically significant direct effect of experimental condition on length of time spent on the study session (z-score standardized due to model fit issues) such that participants in the control condition spent more time on the study session

compared to participants in the want-to condition (B = 0.48, 95% CI [0.05, 0.91], SE[B] = 0.22, $\beta = 0.23$, p = 0.03). No difference was found between participants in the want-to and have-to conditions (B = 0.17, 95% CI [-0.28, 0.61], SE[B] = 0.23, $\beta = 0.08$, p = 0.46). Caution is needed in interpreting this result because no statistically significant difference on this outcome was found for the regression analyses reported above. No other statistically significant direct or indirect effects were found. Full SEM results from this model are reported in Appendix A3 – 3.

The second SEM examined the relationship between experimental condition, perceived task values for the MCAT quiz, and MCAT quiz outcomes (time spent and performance). Model fit was good ($\chi 2(8) = 10.40$, p = 0.24, CFI = 0.99, RMSEA = 0.05). Results found no evidence of statistically significant direct or indirect effects. Full SEM results for this model are reported in Appendix A3 – 3.

Overall, across these two SEM models, there is no evidence of an indirect effect of perceived task values between experimental condition and the outcomes of interest.

Exploratory Analyses

Moderation by parental education. Moderation of want-to versus have-to condition on outcomes by parental education was assessed using moderated regression. The overall interaction term was significant for two outcomes: number of temptations clicked during the study session $(B = -0.52, 95\% CI [-0.91, -0.14], SE[B] = 0.19, \beta = -0.37, p = 0.008)$ and performance on the study session $(B = -0.59, 95\% CI [-0.42, -0.13], SE[B] = 0.23, \beta = -0.36, p = 0.01)$ (see Appendix A3 – 4 for graphs of these interaction effects). For number of temptations during the study session, simple effects found that participants in the want-to condition whose parents did not graduate from college clicked on more temptations compared to those in the have-to condition whose parents did not graduate college (B = 0.63, SE[B] = 0.23, p = 0.01). There was no

difference for participants whose parents graduated college (B = -0.24, SE[B] = 0.23, p = 0.29). Similarly, for number correct during study session, results found that participants in the want-to condition whose parents did not graduate scored better than participants in the have-to condition whose parents did not graduate college (B = 0.61, SE[B] = 0.27, p = 0.03). There was no difference for participants whose parents graduated college (B = -0.38, SE[B] = 0.27, p = 0.17). Overall, the results are mixed: the want-to condition increased the number of temptations for lower SES students compared to lower SES students in the have-to condition. However, at the same time, lower SES students in the want-to condition scored better on the study session than those in the have-to condition. These results should be interpreted with caution because of the small sample size. Full results for the moderation analyses are reported in Appendix A3 – 5.

Qualitative coding: Treatment fidelity. Across both want-to and have-to conditions, results showed that 48% of the participants wrote about want-to reasons only, 14% wrote about have-to reasons only, and 38% wrote about both want-to and have-to reasons. Within experimental condition, 67% of participants in the want-to condition wrote about want-to reasons only while 33% wrote about both want-to and have-to reasons and none wrote about have-to reasons only. Meanwhile, only 29% of participants in the have-to condition wrote about have-to reasons only, 27% wrote about want-to reasons only, and 44% wrote about both want-to and have-to reasons participants from chi-square test show that the proportions of what reasons $(X^2 (2, N = 64) = 18.14, p < .001)$,

Next, I conducted a set of multiple regressions to assess each outcome as a function of this treatment fidelity code. In other words, I examined whether the outcomes differed by what reasons participants wrote about regardless of the assigned experimental condition.

Unfortunately, due to small sample size, I could not test whether differences emerged when only including those who adhered to the instructions within each condition (i.e., participants who wrote only about want-to reasons in the want-to condition versus participants who wrote only about have-to reasons in the have-to condition). No significant results were found for any outcomes of interest by what the participants wrote about regardless of their assigned condition. Full results from all multiple regressions are reported in Appendix A3 - 6.

Qualitative coding: Thematic coding. Appendix A3 – 7 includes the summary statistics (*M* and *SD*) for each LIWC category overall and by want-to versus have-to conditions (1 = want-to condition, 0 = have-to condition). Results from linear regressions examining the sixteen LIWC categories as a function of want-to or have-to condition found four statistically significant differences: affect, positive emotion, reward, and present orientation. Specifically, results found that participants in the want-to condition compared to the have-to condition wrote more affective words (*B* = 2.86, 95% CI [1.17, 4.54], *SE*[*B*] = 0.85, β = 0.37, *p* = 0.001), more positive emotion words (*B* = 2.84, 95% CI [1.16, 4.52], *SE*[*B*] = 0.84, β = 0.37, *p* = 0.001), and more reward-related words (*B* = 0.80, 95% CI [0.04, 1.56], *SE*[*B*] = 0.38, β = 0.24, *p* = 0.04). Meanwhile, participants in the have-to condition compared to those in want-to condition wrote more present-focused words (*B* = -3.03, 95% CI [-4.93, -1.14], *SE*[*B*] = 0.95, β = -0.35, *p* = 0.002). There were no other statistically significant differences by want-to versus have-to condition. Full results for all linear regressions are reported in Appendix A3 – 8.

Next, I investigated the indirect effect between want-to versus have-to condition (1 = want-to, 0 = have-to) and outcomes through the three statistically significant word categories (affect, reward-related words, and present-focused words). Due to multicollinearity between affect and positive emotion (r = .98), positive emotion was removed from these analyses. Full

SEM results are reported in Appendix A3 – 9. The first SEM examined the relationship between experimental condition, word categories, and study session outcomes. The model was saturated which does not allow for a test of model fit. Significant direct effects between condition and the word categories emerged comparable to the regression results above (see Appendix A3 – 9). In addition, a direct effect of affect on performance during the study session was significant (B = 0.11, 95% CI [0.001, 0.23], $SE[B] = 0.06, \beta = 0.27, p = 0.048$) such that participants who wrote more affective words were more likely to score better on the MCAT questions in the study session through affect was trending towards significant (B = 0.33 95% CI [-0.05, 0.70], SE[B] = 0.19, p = 0.09) such that the want-to condition increased the number of affective words written which, in turn, was positively associated with the number of correct questions. Results found no other statistically significant direct or indirect effects (Appendix A3 – 9).

The second SEM examined the relationship between experimental condition, word categories, and MCAT quiz outcomes. The model was saturated which does not allow for a test of model fit. Significant direct effects between condition and word categories emerged comparable to the regression results reported above (Appendix A3 – 9). In addition, a significant direct effect emerged for affect on performance on the MCAT quiz (B = 0.29, 95% CI [0.02, - 0.56], $SE[B] = 0.14, \beta = 0.29, p = 0.03$) such that participants who wrote more affective words were more likely to score better on the MCAT quiz, matching the finding from the prior SEM that found a positive association between affective words and study session performance. Moreover, a similar indirect effect between affect and performance on the MCAT quiz was trending towards significant (B = 0.84 95% CI [-0.07, 0.1.75], SE[B] = 0.46, p = 0.07) such that

the want-to condition led to an increase in affective words which, in turn, positively predicted a better score on the MCAT quiz.

The last SEM examined the relationship between experimental condition, word categories, and self-reported goal progress, effort, and obstacles. The model was saturated which does not allow for a test of model fit. The significant direct effects between condition and word categories were comparable to the regression results reported above (Appendix A3 – 9). Two additional significant direct effects were found between condition and obstacles (B = -0.86, 95% CI [-1.70, -0.05], $SE[B] = 0.41, \beta = -0.26, p = 0.04$) and between affect and obstacles (B = -0.11, 95% CI [-0.22 -0.001], $SE[B] = 0.06, \beta = -0.25, p = 0.49$) such that participants in the want-to condition and those who wrote more affective words were less likely to report obstacles. Most importantly, an indirect effect of affect between condition and obstacles was trending towards significant (b = -0.32, 95% CI [-0.68, 0.05], SE[b] = 0.19, p = 0.09) such that the want-to condition led to more affective words which, in turn, predicted a lower level of perceived obstacles.

Discussion

Confirmatory Analyses: Summary, Limitations, and Future Directions

The present chapter investigated the causal impact of want-to versus have-to motivation for a career future identity on pre-medicals students' perceived value, self-control, and achievement during an online, MCAT learning session. Results showed no evidence that the manipulation impacted perceived task value (measured by self-reported value for study session and MCAT quiz), self-control (measured by time spent and temptations clicked during study session), or achievement (number of correct MCAT questions during either study session or final quiz). However, results found that participants randomly assigned to write about want-to reasons for becoming a doctor reported lower perceived obstacles to becoming a doctor over the past six weeks compared to participants who were assigned to write about have-to reasons for becoming a doctor or the past day's events. In sum, the experimental test of the motivation pathway in AMP did not impact pre-medical students' perceived value, self-control, and achievement but did lower perceived obstacles towards reaching their goal of becoming a doctor. These results do not provide evidence for the motivation pathway in AMP, and in the following discussion, I highlight several reasons why no differences across condition were found.

Understanding the null effects. Students who wrote about want-to reasons did not report greater identification, interest, or relevance with the study session or MCAT quiz, click less temptations during the study session, or score better on the MCAT questions compared to students who wrote about have-to reasons or the days' past events. These results impact the internal validity of AMP since there is no evidence that experimentally manipulating the motivation pathways increases perceived value for goal-directed behaviors or overall selfcontrol.

A multitude of reasons exist for these null findings. First, this was an online study that participants could complete anywhere, thus, making it possible that engagement with the manipulation and overall study was low. Conducting this study in a laboratory setting may lead to higher engagement level with the writing manipulation, and in turn, evidence that want-to motivation leads to higher perceived value and self-control. Additionally, the mean number of temptations clicked was less than one (M = 0.60). This low number means participants, on average, did not engage with the temptations potentially because they thought the temptations were not very tempting. Therefore, with improved measurement of temptations (i.e., more

realistic temptations that participants feel compelled to interact with), results may find an effect of motivation on perceived value and self-control. Present results suggest that it was hard to find a difference between conditions because very few participants engaged in the temptations and, thus, the conclusions regarding the relationship between motivation, perceived value, and selfcontrol remain unclear.

Similarly, the manipulation may have been weak, and an improved manipulation that makes participants write strictly about either want-to or have-to reasons may increase perceived value and self-control. However, the manipulation did affect perceived obstacles comparable to past research (Leduc-Cummings et al., 2017) suggesting it was strong enough to impact students' self-reported perceptions about obstacles towards goal pursuit but not strong enough to impact their perceived value for behavioral tasks or their actual performance on these behavioral tasks (e.g., number of distractions clicked). The results from the exploratory analyses corroborates the possibility of a weak manipulation since only 67% of participants in the want-to condition wrote about want-to reasons and 29% of participants in the have-to condition wrote about have-to reasons. This wide variation in how people interpreted the manipulation suggests a more controlled setting, better manipulation, and stronger dosage may lead to better adherence to the treatment instructions and, in turn, significant effects on self-control and perceived value. At the same time, it is possible that students-regardless of what they wrote about-believed they were writing about only want-to or only have-to reasons, and this belief led to the effect on perceived obstacles. More research utilizing similar experimental manipulations is needed to understand whether the effect exists or not.

At the same time, it is possible that the relationship between motivation, perceived value, and self-control does not exist, or that perceived task value may not represent a key mechanism

108
between motivation and self-control (see perceived obstacles discussion in next section). In a similar vein, want-to motivation may operate on trait or developmental level and not a state one, and therefore, it may be hard to change an individual's motivation momentarily through a short writing exercise. After all, an individual's motivation for a future identity is derived from countless factors including an individual's disposition and personality traits (Sheldon & Elliot, 1999) as well as their socioeconomic status, culture, and repeated experiences with others (Dietrich & Salmela-Aro, 2013; Sheldon et al., 2004). Thus, the effect of personality and broader environment likely makes it hard to momentarily adjust individuals' motivations for future identities. On the other hand, motivation could represent a developmental phenomenon that falls somewhere between a trait or state level. Evidence for this perspective is found in Chapter 2 where want-to and have-to reasons were relatively stable across measurement points. However, Chapter 2 was only one year long and during an important developmental transition where motivation needed to remain stable (i.e., graduates need to find a jobs). Thus, over a longer time periods or during different developmental points, changes in motivation may be observed. In sum, further research is needed to understand when motivation operates on a continuity versus change continuum.

Altogether, these results suggest multiple future research avenues to investigate the motivation pathway in AMP. One includes experimental studies that contain stronger manipulations, better measurement of temptations, and more participants. Another includes longitudinal studies that investigate the motivation pathway in AMP over the course of multiple years and evaluates their stability during key developmental transitions, like one assessed in Chapter 2. Regardless of the null findings, the present chapter was an initial test of the

motivation pathway in AMP that examined all components (motivation, perceived value, and self-control).

These null effects underscore another key point about which pathways in AMP are amenable to outside influence. Based on past theory and research (e.g., Heckhausen et al., 2010; Sheldon & Elliot, 1999), motivation and pursuit are theorized to remain relatively stable across time and less likely to be immediately impacted by contextual factors. Moreover, in empirical studies (e.g., Haase et al., 2008; Milyavskaya et al., 2015), motivation and pursuit are overwhelmingly measured not manipulated. However, the activation pathway is different since identity-based motivation (Oyserman & Destin, 2010) posits that the salience of future identities is shaped by contextual factors, and empirical studies (e.g., Destin & Oyserman, 2010; Lewis Jr. & Oyserman, 2015; Nurra & Oyserman, 2018) from identity-based motivation are overwhelmingly experimental in nature. For instance, subtle situational factors can change the salience of future identities and influence achievement and motivation. Therefore, activation may represent the AMP pathway most amenable to experimental manipulations.

Perceived obstacles. Participants in the want-to condition reported fewer obstacles towards becoming a doctor, and this aligns with past experimental and correlational research on want-to motivation and perceived obstacles (Hofmann et al., 2012; Leduc-Cummings et al., 2017; Milyavskaya et al., 2015; Werner et al., 2016). For example, experience sampling studies (Werner et al., 2016) with college students find that increases in want-to motivation are associated with increases in perceived ease of goal pursuit. Similarly, in an experimental study, participants randomly assigned to write about their want-to reasons for eating healthy compared to their have-to reasons perceived less obstacles over the next week (Leduc-Cummings et al., 2017). Therefore, evidence is mounting that want-to motivation for a goal leads an individual to

perceive goal pursuit as easier and to experience less obstacles, and these attitudes partially explain why want-to motivation leads to greater goal attainment as well (Werner & Milyavskaya, 2019). On the other hand, the low treatment fidelity (i.e., one-third in want-to condition and twothirds in have-to condition did not adhere to instructions) suggests that the manipulation did not work and this effect on perceived value may be spurious (i.e., a false positive). Future research should continue to examine the relationship between want-to motivation, obstacles, and goal attainment as well as investigate whether perceived obstacles represents a key mechanism between want-to motivation and self-control, especially considering the null findings on perceived value as a mediator.

Exploratory Analyses: Summary, Limitations, and Future Directions

I investigated three streams of exploratory analyses to understand why the experimental manipulation impacted obstacles but no other outcomes. In the first stream, parental education was examined as a moderator of the relationship between the want-to versus have-to condition and outcomes. Parental education was examined as a moderator because past research finds that students from lower SES backgrounds are more motivated by interdependence (which is conceptually like have-to motivation) compared to students from higher socioeconomic backgrounds (e.g., Stephens et al., 2015). Results found that students in the want-to condition whose parents did not attend college were more likely to click on the temptations in the study session compared to students in the have-to whose parents did not attend college. At the same time, students in the want-to condition whose parents did not attend college scored better on the study session compared to students in the have-to condition. Altogether, the results from this moderation analyses with a small sample size suggest that parental education is an important contextual factor that may change the strength of the relationship between motivation, perceived

value, self-control, and achievement. Future research should investigate this relationship with larger sample sizes to confidently assess moderation; regardless, this exploratory finding underscores the need to account for contextual factors, including but not limited to socioeconomic status, culture, and family life, in AMP.

In the second stream of exploratory analyses, I coded for adherence to treatment instructions (e.g., did participants in the want-to and have-to conditions write about want-to reasons, have-to reasons, or both?). Results found that two-thirds of participants in the want-to condition wrote about want-to reasons only while one-third wrote about both want-to and haveto reasons. Meanwhile, roughly a quarter of participants in the have-to condition wrote about either want-to reasons only or have-to reasons only while the other half wrote about both want-to and have-to reasons. This wide variation suggests further refinement to the manipulation so that more participants follow the instructions. Simultaneously, these findings suggest that attention to just want-to or have-to reasons is difficult for many participants, and this ties back to the question of whether motivation operates on a trait, developmental, or state level. Individuals because of past experiences, culture, personality, and other factors-have hardened beliefs regarding why they want to pursue a career future identity, and these may change only over long periods of time, during specific developmental periods, or with stronger experimental manipulations. Overall, the effect on perceived obstacles paired with the lack of treatment fidelity underscores the need for more research investigating the experimental effect (or lack thereof) of motivation on self-control, perceived value, and attitudes more broadly.

In the last stream of exploratory analyses, I investigated the written responses in the want-to and have-to condition for differences in word frequencies across sixteen categories ranging from total word count to future-focused words. The goal of this stream was to investigate

whether the prompts in the two conditions led participants to write with additional emotion (tone, positive and negative emotion, etc.), about different time horizons (e.g., past, present, etc.), or about more potential motives (e.g., family, friends, money, etc.). Across these sixteen categories, four significant findings emerged: (1) participants in the want-to condition wrote more affective, positive, and reward-related words compared to participants in the have-to condition and (2) participants in the have-to condition. Thus, the want-to condition prompt led students to use more emotion-related words while the have-to condition prompt led students to focus more on the present.

Moreover, marginally significant indirect effects for the number of affective words from want-to versus have-to conditions to performance on the study session and MCAT quiz as well to self-reported obstacles were found such that participants in the want-to condition wrote words that contained more affect, either positive or negative, and this increase in affective word use predicted better performance on the MCAT questions and lower perceived obstacles. This result suggests that the want-to prompt worked to increase performance and reduce perceived obstacles by increasing the emotionality students used in their responses. Moreover, this links with past research that finds positive affect predicts increases in motivation (Erez & Isen, 2002; Isen & Reeve, 2005). Future research should disentangle the relationship between want-to motivation, emotions, and achievement and goal pursuit. One possible explanation is that students in the want-to condition wrote more positive words because they were asked to write about what they were interested in, passionate about, or identified with. Writing about why one would enjoy becoming a doctor naturally lends itself to a more positive description, and this may help students relax and perform better on MCAT questions as well as perceive goal pursuit as easier. Moreover, these findings may help to elucidate why past research finds that ease of goal pursuit

and perceived obstacles mediate the relationship between want-to motivation and goal attainment (Werner & Milyavskaya, 2019).

Real-World Implications

Several real-world implications flow from these findings. First, increasing passion, interest, and identification with long-term goals has potential to reduce perceived obstacles and, based on past research (Milyavskaya et al., 2015; Werner et al., 2016), boost goal attainment. Policies and programs in education should assist students in attending to their want-to reasons for pursuing their career future identity to reduce perceived difficulties in goal pursuit and improve achievement. Another important implication is that contextual factors my moderate the relationship between motivation and self-control. Findings revealed that parental education changed the relationship between experimental condition and achievement and self-control. Although the sample size was small and analyses were exploratory, these findings underscore the need to examine contextual moderators in the relationship between motivation and self-control.

Last, although this study did not find significant effects on self-control, it improved the measurement of self-control compared to past studies (Friese et al., 2018) by creating a choice between a goal-directed behavior and a temptation, and this aligns with recent calls for improved measurement (Galla et al., 2014; Lurquin & Miyake, 2017). Most importantly, better measurement of self-control and the key mechanisms that may be driving the process of self-control (i.e., perceived task value) are needed to understand what self-control is, how it occurs, and when it occurs. Without a concrete understanding of self-control, it is impossible to connect the micro (i.e., everyday behaviors) to macro level (programs, policies, etc.) since it will be difficult to craft programs and interventions that target processes such as self-control or know the boundary conditions under which these programs and interventions should be successful.

Conclusion

Chapter 3 assessed a proof-of-concept experiment to test AMP's motivation pathway and assessed whether self-control can be improved by changing students' motivation in-the-moment. However, results found no difference in self-control or perceived value by condition suggesting that motivation is hard to change or requires a stronger manipulation. Nevertheless, a significant result was found for perceived obstacles such that students in the want-to condition reported lower obstacles to becoming a doctor compared to students in the have-to and control conditions. Future research should examine whether perceived obstacles represents a key mechanism between motivation and goal attainment. Last, this study provides a unique, accurate measure of self-control and calls for future research to examine sociodemographic moderators of AMP.

Concluding Remarks

Students, and individuals more broadly, are bombarded with temptations constantly, and they need to resist some of these temptations to reach their goals and become who they want to be (e.g., studying versus watching *TV*, paying attention in class versus scrolling social media, going to study group versus going to the movies, etc.). However, this is difficult because temptations are immediate and emotionality stimulating (Hofmann & Van Dillen, 2012). For years, researchers have investigated self-control from an individual perspective that asked how much resources or working memory an individual had to overcome these temptations (Baumeister et al., 2007; Hofmann et al., 2009). These models, although inadvertently, promoted deficit-oriented thinking where the self-control failure occurred because the individual did not have the capacity or ability to inhibit the temptation. However, following mixed empirical evidence (Carter & McCullough, 2014; Hagger et al., 2016) and new avenues for self-control

research (Berkman et al., 2016) that emphasized perceived value as the key driver, I theorized that future identities may help to understand self-control, and in the three present studies, I proposed and tested a novel process where future identity impacts self-control through perceived value.

In Chapter 1, I outlined the AMP process for self-control, and several implications flow from this study. Every student possesses a career future identity of what they want to do when they grow older, and the decision to study, pay attention in class, or complete extra credit work is ultimately in service of this future identity since this schoolwork is necessary for reaching that identity. However, this future identity is not stagnant but rather dependent on the context including the immediate setting, sociodemographic groups, broader culture, and more. Emphasizing the context-dependence of future identities shifts how self-control occurs away from simply an individual's ability or capacity (or lack thereof) to instead both the broader context and an individual's identity. Future identities represent a construct that is more amenable to outside forces compared with working memory or a domain-general resources, and, thus, opens new avenues for investigation into self-control that considers factors, such as where a student lives, their family experience, and their place of their birth.

Future identities in AMP represent long-term, identity-tied goals, and therefore, characteristics of goals, such as activation, motivation, and pursuit, can be applied to future identities. After all, students do not have only a future identity of becoming an engineer but also have varying levels of motivation and pursuit for this future identity as well. By considering all three pathways, AMP extends past models (J. Heckhausen et al., 2010; Oyserman & Destin, 2010; Sheldon & Elliot, 1999) of motivation and regulation, and this is especially the case with the introduction of perceived value as a key mechanism between future identities and selfcontrol. Introducing perceived value allows AMP to adopt a mechanistic perspective between future identities and self-control, seeking to understand how individual's conceptions of their long-range, identity-related goals ultimately influence their everyday behavior. In identity-based motivation (Oyserman & Destin, 2010) and the motivational theory of lifespan development (J. Heckhausen et al., 2010), research examines how constructs such as future identities or goal engagement influence downstream behaviors and attitudes but do not examine the mechanism through which these constructs lead individuals to have those attitudes or enact those behaviors.

This mechanistic approach also has implications for interventions, policies, and programs because it connects macro-level processes to micro-level ones. Every intervention, policy, or school initiative to improve achievement needs to understand how students connect their longterm goals with their everyday decisions. AMP provides this with its emphasis on perceived value. As mentioned in the introduction, teachers may improve students' classroom engagement by developing writing exercises that promote students' activation, motivation, and pursuit for their future identity which, in turn, will boost students' perceived value for schoolwork making it less likely they are tempted by friends or social media. Moreover, large-scale policies or programs like two generation programs (Chase-Lansdale & Brooks-Gunn, 2015) may benefit from designing activities for the parents that foster future identities and perceived value. Last, states may improve school practices by emphasizing activation, motivation, and pursuit in their curriculums. Altogether, AMP represents a novel process to understand how individuals can pursue goal-directed behaviors in the face of competing temptations.

However, the varying results from Chapter 2 and 3 lead to an important question: Does the activation, motivation, and pursuit in AMP operate on a state, trait, or developmental level? Results from Chapter 2 suggest that motivation and pursuit for a career future identity are quite stable over a one-year period. At the same time, this may be a function of the developmental period assessed where students need to find a job after graduating and are required to maintain their motivation and pursuit. On the other hand, Chapter 3 found that the experimental manipulation targeting motivation did reduce pre-medical students' perceived obstacles suggesting that motivation may operate on a state level. However, the manipulation may not have been strong enough to change students' perceived value or their actual behavior. Similarly, the measurement of self-control across both studies could be improved which may lead to a better test of the pathways in AMP. For instance, Chapter 2 relied on self-reported achievement while Chapter 3 utilized a novel, more accurate measure of self-control. Despite this, the overall number of temptations clicked during Chapter 3 was less than one suggesting the temptations were not powerful enough.

In the end, the answer to this question requires more research that examines the pathways in AMP with different groups of students, at different developmental periods, with more realistic measures, and with stronger manipulations. In addition, because future identities are contextdependent, future research needs to assess the contextual moderators of AMP, such as SES, race/ethnicity, and interdependent versus independent culture. If AMP is validated with more research, it's applications to interventions, policies and programs, and school practices may be numerous and represent a distinct shift from prior conceptualizations of self-control. No longer is a student's achievement a matter of just their ability or capacity; rather, it may occur through a combination of the broader context they find themselves in and how they conceive of themselves in the future.

Figures

Chapter 1 Figures

Figure 1 - 1. The activation, motivation, and pursuit (AMP) process for self-control



Note. The activation of a future identity in a corresponding domain with the self-control decision (e.g., a career future identity is activated when faced with a decision to study for an exam or watch TV) will increase the likelihood of engaging in self-control because it will increase the utility value (i.e., usefulness of the goal-directed behavior for the future identity) for the goaldirected behavior. The activation of a future identity is placed above the motivation and pursuit for that future identity because activation is necessary for the motivation and pursuit to impact self-control. In addition, the activation of a future identity is influenced by the broader context such as the setting, culture, and social groups the individual identifies with. Want-to motivation (i.e., pursuing the future identity because you are interested in it or identity with it) will increase the attainment (i.e., a task is related to one's identity) or intrinsic (i.e., a task is interesting) value for the goal-directed behavior while have-to motivation (i.e., pursuing the future identity because others pressure you or you would feel anxious or guilty if you did not) will not lead to those values for the goal-directed behavior. The pursuit for future identity (i.e., investing time, effort, and resources and asking others for help) will decrease the effort cost associated with engaging in the goal-directed behavior and, thus, increase self-control. The perceived task value for the tempting behavior is visualized but not central to the hypotheses in AMP. As shown, the perceived task value for the goal-directed behavior is more than for the perceived task value for the tempting behavior so self-control is initiated.

Chapter 2 Figures

Figure 2 - 1: Summary of cross-lagged models between either self-concordance (Figure 2 - 1a) or goal engagement

(Figure 2 - 1b) and career success

(a) Summary of cross-lagged model between self-concordance and career success.



(b) Summary of cross-lagged model between goal engagement and career success.



Note. Figure 2 – 1a is visual summary of cross-lagged models between self-concordance and career success (career goal progress and career satisfaction). Model fit for career goal progress model: $\chi^2(12) = 33.79$, p = .001, CFI = .97, RMSEA = .06. Model fit for career satisfaction model: $\chi^2(12) = 22.53$, p = .03, CFI = .99, RMSEA = .04. Figure 2 – 1b

120

is a visual summary of cross-lagged models between goal engagement strategies and career success (career goal progress and career satisfaction). Model fit for career goal progress model: $\chi 2(12) = 5.98$, p = .92, CFI = 1.00, RMSEA < .001. Model fit for career satisfaction model: $\chi 2(12) = 14.27$, p = .28, CFI = 1.00, RMSEA = .02. Numbers represent standardized regression coefficients. Residual intercorrelation paths after T1 were constrained to be equal and are not shown here. Cross lagged paths also were constrained to be equal (see, Keijsers, Loeber, Branje, & Meeus, 2011). CGP = Career goal progress. CS = Career Satisfaction. T1 = Graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, T4 = 1 year after graduation. *p = .05. **p = .01. ***p = .001



Figure 2-2: Summary of cross-lagged models between self-concordance and goal engagement

Note. Model fit: $\chi^2(12) = 10.38$, p = .58, CFI = 1.00, RMSEA < .001. Numbers represent standardized regression coefficients. Residual intercorrelation paths after T1 were constrained to be equal and are not shown here. Cross-lagged paths also were constrained to be equal (see, e.g., Keijsers, Loeber, Branje, & Meeus, 2011). T1 = Graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, T4 = 1 year after graduation. **p* = .05. ***p* = .01. ****p* = .001

Chapter 3 Figures





Note. Results from the multiple regressions found that the experimental conditions were statistically significantly different on reported obstacles F(2, 104) = 4.08, p = 0.02) such that the want-to condition reported lower obstacles to becoming a doctor compared to both the have-to condition (B = 0.85, 95% CI [0.13, 1.57], SE[B] = 0.36, $\beta = .26$, p = 0.02) and control condition (B = 0.72, 95% CI [0.02, 1.42], SE[B] = 0.35, $\beta = 0.23$, p = 0.04).

Tables

Chapter 1 Tables

Table 1 – 1. Core and related theoretical support for AMP

AMP Pathway	Core	Related	Prediction
	Theoretical Support	Theoretical Support	
Activation	Identity-Based Motivation (Destin & Oyserman, 2010)	Theories with goal hierarchy (e.g., Carver & Scheier, 1982) Construal Level Theory of Psychological Distance (Trope & Liberman, 2010) Action Identification Theory (Vallacher & Wegner, 1987) Self-Completion Theory (Wicklund & Gollwitzer, 2013)	The activation (i.e., salience) of a future identity in the corresponding domain to a self-control decision boosts the utility value (i.e., relevance) for the goal-directed behavior increasing the likelihood of self-control.
Motivation	Self-Concordance Theory (Sheldon & Elliot, 1999)	Self-Determination Theory (Deci & Ryan, 2002)	
Want-to			Want-to motivation (i.e., interest in or identification with) for a future identity boosts the attainment (i.e., importance) or intrinsic (i.e., interest) value for the goal-directed behavior increasing the likelihood of self-control.
Have-to			Have-to motivation (i.e., external pressure or feelings of guilt/anxiety) for a future identity does not increase attainment or intrinsic value for a goal-directed behavior and, thus, does not increase likelihood of self-control.
Pursuit	Motivational Theory of Lifespan Development (Heckhausen, Wrosch, & Schulz, 2010)	Dual-Process Model of Assimilative and Accommodative Coping (Brandtstädter & Renner, 1990) The Model of Selection, Optimization, and Compensation (Freund & Baltes, 1998) Rubicon Model of Action Phases (H. Heckhausen & Gollwitzer, 1987)	The pursuit (i.e., investment of effort, time, and resources) towards a future identity will decrease the effort cost for the goal-directed behavior (i.e., how demanding and time-consuming the behavior is) increasing the likelihood of self-control.

	1	2	3	4	5	6	7	8	9
М	3.66 – 3.77	3.72 – 3.87	6.83 – 7.21	3.41 – 3.69	87%	\$1545	53%	11.60	30%
SD	.52 – .54	1.27 – 1.46	2.30 – 2.56	1.07 – 1.24	-	\$727	50%	1.71	-
1 Goal Engagement	-								
2 Self- Concordance	.08 – .25	-							
3 Career Goal Progress	.06 – .24	.03 – .30	-						
4 Career Satisfaction	.04 – .26	.10 – .32	.14 – .68	-					
5 Employment 6 Income 7 Major	.12 – .16 .01 – .08 03 – .04	.01 – .14 .03 – .08 05 – .07	.11 – .35 .24 – .35 .17 – .28	.0541 .2135 .1528	- .29 .11	- .66	_		
8 Parental Education	1206	07 – .05	01 – .05	.0012	03	.07	.08	-	
9 Gender	18 –13	13 –03	.03 – .16	01 – .09	.03	.22	.25	.07	-

Chapter 2 Tables

Table 2 - 1. Range of summary statistics and zero-order correlations across waves

Note. Each cell represents the range of the mean, standard deviation, or zero-order correlations across the four waves except for the study variables that were only measured at one wave (employment, income, age, major, parental education, and gender). Employment (1 = employed), major (1 = favorable employment opportunities majors: medicine and psychology), and gender (1 = male) are dichotomous variables; therefore, only percentages are reported for the mean. M = mean. SD = standard deviation.

Chapter 3 Tables

	Ove	erall	Contro	1	Have-to		Want-to			
	М	SD	М	SD	М	SD	М	SD		
Attainment Value during Study Session	5.4	1.3	5.1	1.4	5.7	1.3	5.5	1.2		
Intrinsic Value during Study Session	4.2	1.5	4.2	1.4	4.1	1.7	4.2	1.5		
Utility Value during Study Session	5.5	1.4	5.2	1.3	5.8	1.3	5.5	1.4		
Time Spent on Study Session	323.5	269.7	371.5	426.6	319.9	143.0	280.0	106.5		
# of Temptations Clicked during Study Session	0.6	1.5	0.7	1.8	0.4	1.1	0.7	1.7		
# of Correct on Study Session	7	1.6	7.3	1.4	6.7	1.8	6.9	1.5		
Attainment Value during MCAT Quiz	4.9	1.3	4.7	1.3	5.3	1.2	4.9	1.4		
Intrinsic Value during MCAT Quiz	4.5	1.6	4.8	1.4	4.3	1.6	4.3	1.7		
Utility Value during MCAT Quiz	5.0	1.5	4.6	1.6	5.4	1.3	4.9	1.4		
Time Spent on MCAT Quiz	516.3	195.9	522.3	217.1	537.0	173.6	492.2	195.0		
# Correct on MCAT Quiz	13.8	3.9	14	4	13.7	3.5	13.8	4.4		
Self-Reported Obstacles	5.5	1.5	5.7	1.2	5.9	1.1	5.0	2.0		
Self-Reported Effort	5.6	1.3	5.9	1.0	5.7	1.2	5.3	1.5		
Self-Reported Progress	5.4	1.2	5.6	1.1	5.3	1.2	5.3	1.2		
Gender	0.7	0.4	0.8	0.4	0.7	0.4	0.6	0.5		
Parental Education	4.9	1.5	4.6	1.7	4.8	1.5	5.1	1.3		
ACT	1.4	0.7	1.4	0.7	1.5	0.9	1.3	0.5		
	(33-36)		(33-36)		(30-32)		(33-36)			
SAT	1.7	1.3	1.8	1.4	2.2	1.7	1.2	0.4		
	(2040-		(2040-2160)		(2040-2160)		(2220-2400)			
	2160)									

Table 3 - 1. Summary statistics overall and by condition

Note. M = mean. SD = standard deviation. ACT and SAT are reported instead of a composite test score measure because the composite test score is z-scored. The parentheses below the mean for ACT and SAT report the range of scores associated with the average scale point.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 SS Attainment Value																	
2 SS Intrinsic Value	.01																
3 SS Utility Value	.84***	03															
4 SS Time Spent	.16	.14	.12														
5 SS # of Temptations	02	00	.01	.55***													
6 SS # Correct	18	.09	12	.05	05												
7 MQ Attainment Value	.74***	$.20^{*}$.64***	.19*	.01	08											
8 MQ Intrinsic Value	.09	.74***	.05	.04	10	.04	.30**										
9 MQ Utility Value	.72***	.12	.73***	.19	.06	05	.81***	.21*									
10 MQ Time Spent	.06	.04	.01	.10	08	.28**	.14	.11	.13								
11 MQ # Correct	.04	.23*	.08	02	12	.43***	.20*	.24*	.17	0.23*							
12 Obstacles	.01	25**	.07	.05	.04	13	.06	18	.08	04	02						
13 Effort	.08	.08	.02	.02	08	.01	.26**	.13	.09	.10	.24*	.44***					
14 Progress	.09	.26**	04	.03	13	.00	.14	.18	.07	.08	.14	06	.46***				
15 Age	05	.13	04	12	25**	.21*	.10	.14	.07	.15	.38***	.12	.31**	.26**			
16 Gender	05	06	10	18	.04	.20*	.02	.01	06	.09	04	.06	.00	01	.13		
17 Parent education	.10	05	.15	01	09	.11	.02	07	.05	28**	.11	04	04	.10	.09	.04	
18 Test Score	.15	.00	.06	00	03	25**	.08	.05	.08	.11	08	.16	.01	.01	.06	.11	30**

Table 3-2. Zero-order correlations between key study variables

Note. SS = study session. MQ = MCAT quiz. * < .05, ** < .01, *** < .001.

References

Allport, G. W. (1937). Personality: a psychological interpretation. Oxford, England: Holt.

- Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data. In G. A.
 Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling* (pp. 243–277). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Atkinson, J. W. (1964). An introduction to motivation. Oxford England: Van Nostrand.
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences*. (pp. 1–34). New York, NY: Cambridge University Press.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191-215. http://dx.doi.org/10.1037/0033-295X.84.2.191
- Baumeister, R. F. (2014). Self-regulation, ego depletion, and inhibition. *Neuropsychologia*, 65, 313–319. https://doi.org/10.1016/j.neuropsychologia.2014.08.012
- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, 74, 1252-1265. doi:10.1037/0022-3514.74.5.1252
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science*, 16, 351–355. doi:10.1111/j.1467-8721.2007.00534.x.
- Berkman, E. T., Hutcherson, C. A., Livingston, J. L., Kahn, L. E., & Inzlicht, M. (2017). Selfcontrol as value-based choice. *Current Directions in Psychological Science*, 26, 422–428. https://doi.org/10.1177/0963721417704394

- Berkman, E. T., Kahn, L. E., & Livingston, J. L. (2016). Valuation as a mechanism of selfcontrol and ego depletion. In E. R. Hirt, J. J. Clarkson, & L. Jia (Eds.), *Self-regulation and ego control.* (pp. 255–279). San Diego, CA: Elsevier Academic Press.
- Berkman, E. T., Livingston, J. L., & Kahn, L. E. (2017a). Finding the "self" in self-regulation: The identity-value model. *Psychological Inquiry*, 28, 77–98. doi:10.1080/1047840X.2017.1323463
- Berkman, E. T., Livingston, J. L., & Kahn, L. E. (2017b). The identity-value model of selfregulation: Integration, extension, and open questions. *Psychological Inquiry*, 28(, 157– 164. https://doi.org/10.1080/1047840X.2017.1343069
- Bono, J. E., & Judge, T. A. (2003). Self-concordance at work: Toward understanding the motivational effects of transformational leaders. *Academy of Management Journal*, 46, 554–571. doi: 10.5465/30040649
- Brandtstädter, J., & Renner, G. (1990). Tenacious goal pursuit and flexible goal adjustment: explication and age-related analysis of assimilative and accommodative strategies of coping. *Psychology and Aging*, *5*, 58-67. doi: 10.1037/0882-7974.5.1.58
- Brehm, J. W., & Cohen, A. R. (1962). Explorations in cognitive dissonance. New York: Wiley.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen and J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Brunstein, J. C., & Gollwitzer, P. M. (1996). Effects of failure on subsequent performance: the importance of self-defining goals. *Journal of Personality and Social Psychology*, 70, 395-407. doi: 10.1037/0022-3514.70.2.395

- Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology*, *59*, 538-549. http://dx.doi.org/10.1037/0022-3514.59.3.538
- Canning, E. A., & Harackiewicz, J. M. (2015). Teach it, don't preach it: The differential effects of directly-communicated and self-generated utility–value information. *Motivation Science*, 1, 47–71. https://doi.org/10.1037/mot0000015
- Cantor, N., Norem, J. K., Niedenthal, P. M., Langston, C. A., & Brower, A. M. (1987). Life tasks, self-concept ideals, and cognitive strategies in a life transition. *Journal of Personality and Social Psychology*, 53, 1178. doi: 0022-3514.53.6.1178
- Carter, E. C., Kofler, L. M., Forster, D. E., & McCullough, M. E. (2015). A Series of Meta-Analytic Tests of the Depletion Effect: Self-Control Does Not Seem to Rely on a Limited Resource. *Journal of Experimental Psychology. General*, 144, 796–815. doi: 10.1037/xge0000083
- Carter, E. C., & McCullough, M. E. (2014). Publication bias and the limited strength model of self-control: has the evidence for ego depletion been overestimated? *Frontiers in Psychology*, 5, 1-11. doi: 10.3389/fpsyg.2014.00823
- Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality–social, clinical, and health psychology. *Psychological Bulletin*, 92, 111-135. doi: 10.1037/0033-2909.92.1.111
- Carver, C. S., & Scheier, M. F. (2000). Scaling back goals and recalibration of the affect system are processes in normal adaptive self-regulation: understanding 'response shift' phenomena. *Social Science & Medicine*, *50*, 1715–1722. https://doi.org/10.1016/S0277-9536(99)00412-8

Chaiken, S., & Trope, Y. (1999). Dual-process Theories in Social Psychology. Guilford Press.

- Chase-Lansdale, P. L., & Brooks-Gunn, J. (2015). Two-Generation Programs in the Twenty-First Century. *The Future of Children*, 24, 13–39. https://doi.org/10.1353/foc.2014.0003
- Chen, P., Chavez, O., Ong, D. C., & Gunderson, B. (2017). Strategic resource use for learning: A self-administered intervention that guides self-reflection on effective resource use enhances academic performance. *Psychological Science*, 28, 774–785. https://doi.org/10.1177%2F0956797617696456
- Chib, V. S., Rangel, A., Shimojo, S., & O'Doherty, J. P. (2009). Evidence for a common representation of decision values for dissimilar goods in human ventromedial prefrontal cortex. *Journal of Neuroscience*, 29(39), 12315–12320
- Clarkson, J. J., Hirt, E. R., Jia, L., & Alexander, M. B. (2010). When perception is more than reality: the effects of perceived versus actual resource depletion on self-regulatory behavior. *Journal of Personality and Social Psychology*, 98, 29-46. doi:10.1037/a0017539
- de Charms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York: Academic Press.
- de Witt Huberts, J. C., Evers, C., & De Ridder, D. T. (2014). "Because I am worth it": A theoretical framework and empirical review of a justification-based account of selfregulation failure. *Personality and Social Psychology Review*, 18, 119–138. doi:10.1177/1088868313507533.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, 62, 119–142. doi: 10.1111/j.1467-6494.1994.tb00797.x

- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125, 627-668. doi: 10.1037/0033-2909.125.6.627
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of Self-determination Research*. Rochester, NY: University Rochester Press.
- Destin, M. (2017). An open path to the future: Perceived financial resources and school motivation. *The Journal of Early Adolescence*, *37*, 1004–1031.
 doi:10.1177/0272431616636480
- Destin, M., & Oyserman, D. (2009). From assets to school outcomes: How finances shape children's perceived possibilities and intentions. *Psychological Science*, 20, 414–418. https://doi.org/10.1111/j.1467-9280.2009.02309.x
- Destin, M., & Oyserman, D. (2010). Incentivizing education: Seeing schoolwork as an investment, not a chore. *Journal of Experimental Social Psychology*, 46, 846–849. http://dx.doi.org/10.1016/j.jesp.2010.04.004
- Dietrich, J., & Salmela-Aro, K. (2013). Parental involvement and adolescents' career goal pursuit during the post-school transition. *Journal of Adolescence*, *36*, 121–128. doi: 10.1016/j.adolescence.2012.10.009
- Dirlam, J., & Zheng, H. (2017). Job satisfaction developmental trajectories and health: A life course perspective. *Social Science & Medicine*, 178, 95–103. doi: 10.1016/j.socscimed.2017.01.040
- Duckworth, A., & Gross, J. J. (2014). Self-control and grit: Related but separable determinants of success. *Current Directions in Psychological Science*, 23, 319–325. doi:10.1177/0963721414541462

- Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2016). Situational strategies for self-control. *Perspectives on Psychological Science*, *11*, 35–55. doi:10.1177/1745691615623247
- Duckworth, A. L., Milkman, K. L., & Laibson, D. (2018). Beyond willpower: Strategies for reducing failures of self-control. *Psychological Science in the Public Interest*, 19, 102– 129. https://doi.org/10.1177/1529100618821893
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92, 1087-1101. doi: 10.1037/0022-3514.92.6.1087
- Eccles, J. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist*, 44, 78–89. https://doi.org/10.1080/00461520902832368.
- Eccles, J., Wigfield, A., Harold, R. D., & Blumenfeld, P. (1993). Age and gender differences in children's self-and task perceptions during elementary school. *Child Development*, 64, 830–847. doi:10.2307/1131221.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, *53*, 109–132. doi: 10.1146/annurev.psych.53.100901.135153
- Eisenberg, N., Smith, C. L., Sadovsky, A., & Spinrad, T. L. (2004). Effortful control. In K. Vohs
 & R. Baumeister (Eds.), *Handbook of Self-Regulation: Research, Theory, and Applications* (pp. 259–282). New York, NY: Guilford Press.
- Elliott, E. S., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology*, *5*, 5-12. doi:10.1037/0022-3514.54.1.5

- Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. Journal of Personality and Social Psychology, 51, 1058-1068. doi: 10.1037/0022-3514.51.5.1058
- Erez, A., & Isen, A. M. (2002). The influence of positive affect on the components of expectancy motivation. *Journal of Applied Psychology*, 87, 1055-1067. doi: 10.1037/0021-9010.87.6.1055
- Erikson, E. (1968). Youth: Identity and crisis. New York, NY: WW.
- Evans, J. S. B., & Stanovich, K. E. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspectives on Psychological Science*, 8, 223–241. https://doi.org/10.1177/1745691612460685
- Feather, N. T. (1982). Expectations and actions: Expectancy-value models in psychology. Lawrence Erlbaum Assoc Incorporated.
- Festinger, L. (1962). *A theory of cognitive dissonance*. Stanford University Press, Redwood City, CA.
- Fishbach, A. & Shen, L. (2014). The explicit and implicit ways of overcoming temptation. In J.
 W. Sherman, B. Gawronski, & Y. Trope (Eds.), *Dual-process Theories of the Social Mind.* (pp. 454–467). New York, NY: Guilford Press.
- Flake, J. K., Barron, K. E., Hulleman, C., McCoach, B. D., & Welsh, M. E. (2015). Measuring cost: The forgotten component of expectancy-value theory. *Contemporary Educational Psychology*, 41, 232–244. doi:10.1016/j.cedpsych.2015.03.002
- Freeman, J. B. (2018). Doing psychological science by hand. Current Directions in Psychological Science, 27, 315–323. doi: 10.1177/0963721417746793

- Freund, A. M., & Baltes, P. B. (1998). Selection, optimization, and compensation as strategies of life management: correlations with subjective indicators of successful aging. *Psychology* and Aging, 13, 531-543. doi: 10.1037/0882-7974.13.4.531
- Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization and compensation: Measurement by self-report and construct validity. *Journal of Personality* and Social Psychology, 82, 642-662. doi: 10.1037/0022-3514.82.4.642
- Friese, M., Loschelder, D. D., Gieseler, K., Frankenbach, J., & Inzlicht, M. (2018). Is ego depletion real? An analysis of arguments. *Personality and Social Psychology Review*, doi: 1088868318762183
- Friese, M., Wänke, M., & Plessner, H. (2006). Implicit consumer preferences and their influence on product choice. *Psychology & Marketing*, 23, 727–740. https://doi.org/10.1002/mar.20126
- Fujita, K. (2011). On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review*, 15, 352–366. doi:10.1177/1088868311411165
- Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. Journal of Personality and Social Psychology, 90, 351-367. doi:10.1037/0022-3514.90.3.351
- Galla, B. M., Amemiya, J., & Wang, M.-T. (2018). Using expectancy-value theory to understand academic self-control. *Learning and Instruction*, 58, 22–33. https://doi.org/10.1016/j.learninstruc.2018.04.004

- Galla, B. M., & Duckworth, A. L. (2015). More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes. *Journal of Personality and Social Psychology*, 109, 508-525. http://dx.doi.org/10.1037/pspp0000026
- Galla, B. M., Plummer, B. D., White, R. E., Meketon, D., D'Mello, S. K., & Duckworth, A. L.
 (2014). The Academic Diligence Task (ADT): Assessing individual differences in effort on tedious but important schoolwork. *Contemporary Educational Psychology*, *39*, 314– 325. doi:10.1016/j.cedpsych.2014.08.001
- Gaudreau, P. (2012). Goal self-concordance moderates the relationship between achievement goals and indicators of academic adjustment. *Learning and Individual Differences*, 22(6), 827–832. doi:10.1016/j.lindif.2012.06.006
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, *54*, 493-503. doi:10.1037/0003-066X.54.7.493
- Gollwitzer, P. M. (2018). The goal concept: A helpful tool for theory development and testing in motivation science. *Motivation Science*, *4*, 185-205. http://dx.doi.org/10.1037/mot0000115
- Gollwitzer, P. M., & Oettingen, G. (2012). Goal pursuit. In R. Ryan (Eds.), *The Oxford Handbook of Human Motivation* (pp. 208–231). New York, NY: Oxford University Press.
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, *38*, 69–119. doi:10.1016/S0065-2601(06)38002-1

- Gollwitzer, P. M., Wicklund, R. A., & Hilton, J. L. (1982). Admission of failure and symbolic self-completion: Extending Lewinian theory. *Journal of Personality and Social Psychology*, 43, 358-371. http://dx.doi.org/10.1037/0022-3514.43.2.358
- Green, L., Fristoe, N., & Myerson, J. (1994). Temporal discounting and preference reversals in choice between delayed outcomes. *Psychonomic Bulletin & Review*, 1, 383–389. doi:10.3758/BF03213979
- Haase, C. M. (2007). Agency and adaptive development in the transition from university to work:A longitudinal study. Dissertation thesis, University of Jena, Jena, Germany.
- Haase, C. M., Heckhausen, J., & Köller, O. (2008). Goal engagement during the school–work transition: Beneficial for all, particularly for girls. *Journal of Research on Adolescence*, *18*, 671–698. doi: 10.1111/j.1532-7795.2008.00576.x
- Haase, C. M., Heckhausen, J., & Silbereisen, R. K. (2012). The interplay of occupational motivation and well-being during the transition from university to work. *Developmental Psychology*, 48, 1739-1752. doi: 10.1037/a0026641
- Haase, C. M., Heckhausen, J., & Wrosch, C. (2013). Developmental regulation across the life span: Toward a new synthesis. *Developmental Psychology*, 49, 964-972. doi:10.1037/a0029231
- Hagger, M. S., Chatzisarantis, N. L., Alberts, H., Anggono, C. O., Batailler, C., Birt, A. R., ...
 Bruyneel, S. (2016). A multilab preregistered replication of the ego-depletion effect. *Perspectives on Psychological Science*, 11(4), 546–573.
- Harackiewicz, J. M., Canning, E. A., Tibbetts, Y., Priniski, S. J., & Hyde, J. S. (2015). Closing achievement gaps with a utility-value intervention: Disentangling race and social class.

Journal of Personality and Social Psychology, 111, 745-765.

https://doi.org/10.1037/pspp0000075

- Harackiewicz, J. M., Rozek, C. S., Hulleman, C. S., & Hyde, J. S. (2012). Helping parents to motivate adolescents in mathematics and science: An experimental test of a utility-value intervention. *Psychological Science*, *23*, 899–906. https://doi.org/10.1177/0956797611435530
- Hare, T. A., Camerer, C. F., & Rangel, A. (2009). Self-control in decision-making involves modulation of the vmPFC valuation system. *Science*, *324*, 646–648. doi: 10.1126/science.1168450
- Harmon-Jones, E., & Mills, J. (Eds.). (1999). Science conference series. Cognitive dissonance:
 Progress on a pivotal theory in social psychology. Washington, DC, US: American
 Psychological Association. http://dx.doi.org/10.1037/10318-000
- Harmon-Jones, C., Schmeichel, B. J., & Harmon-Jones, E. (2009). Symbolic self-completion in academia: evidence from department web pages and email signature files. *European Journal of Social Psychology*, 39, 311–316. https://doi.org/10.1002/ejsp.541
- Heckhausen, H., & Gollwitzer, P. M. (1987). Thought contents and cognitive functioning in motivational versus volitional states of mind. *Motivation and Emotion*, *11*, 101–120. doi:10.1007/BF00992338
- Heckhausen, J. (2006). Developmental Regulation in Adulthood: Age-normative and Sociostructural Constraints as Adaptive Challenges. Cambridge, UK: Cambridge University Press.

- Heckhausen, J. (2007). The motivation-volition divide and its resolution in action-phase models of developmental regulation. *Research in Human Development*, *4*, 163–180. doi:10.1080/15427600701662983
- Heckhausen, J., & Tomasik, M. J. (2002). Get an apprenticeship before school is out: How
 German adolescents adjust vocational aspirations when getting close to a developmental
 deadline. *Journal of Vocational Behavior*, 60, 199–219. doi:10.1006/jvbe.2001.1864
- Heckhausen, J., Wrosch, C., & Fleeson, W. (2001). Developmental regulation before and after a developmental deadline: The sample case of "biological clock" for childbearing. *Psychology and Aging*, *16*, 400–413. http://dx.doi.org/10.1037/0882-7974.16.3.400
- Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review*, 117, 32-60. doi:10.1037/a0017668.
- Heckhausen, J., Wrosch, C., & Schulz, R. (2019). Agency and motivation in adulthood and old age. Annual Review of Psychology, 70, 191–217. doi: 10.1146/annurev-psych-010418-103043
- Higgins, E. T. (1987). Self-discrepancy: a theory relating self and affect. *Psychological Review*, 94, 319-340. doi:10.1037/0033-295X.94.3.319
- Hofmann, W., Baumeister, R. F., Förster, G., & Vohs, K. D. (2012). Everyday temptations: An experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, *102*, 1318–1335. doi:10.1037/a0026545
- Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science*, 4, 162–176. doi:10.1111/j.1745-6924.2009.01116.x

- Hofmann, W., Gschwendner, T., Friese, M., Wiers, R. W., & Schmitt, M. (2008). Working memory capacity and self-regulatory behavior: toward an individual differences perspective on behavior determination by automatic versus controlled processes. *Journal of Personality and Social Psychology*, 95, 962-997. https://psycnet.apa.org/doi/10.1037/a0012705
- Hofmann, W., & Van Dillen, L. (2012). Desire: The new hot spot in self-control research. *Current Directions in Psychological Science*, 21, 317–322.
 doi:10.1177/0963721412453587
- Hulleman, C. S., & Harackiewicz, J. M. (2009). Promoting interest and performance in high school science classes. *Science*, 326, 1410–1412. https://doi.org/10.1126/science.1177067
- Husman, J., & Lens, W. (1999). The role of the future in student motivation. *Educational Psychologist*, *34*, 113–125. doi:10.1207/s15326985ep3402
- Inzlicht, M., & Schmeichel, B. J. (2012). What is ego depletion? Toward a mechanistic revision of the resource model of self-control. *Perspectives on Psychological Science*, *7*, 450–463. doi:10.1177/1745691612454134
- Isen, A. M., & Reeve, J. (2005). The influence of positive affect on intrinsic and extrinsic motivation: Facilitating enjoyment of play, responsible work behavior, and self-control. *Motivation and Emotion*, 29, 295–323. doi: 10.1007/s11031-006-9019-8
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one though twelve. *Child Development*, 73, 509–527. https://doi.org/10.1111/1467-8624.00421

James, W. (2013). The principles of psychology (Vol. 1). Read Books Ltd.

- Jia, L., Yu, R., Hirt, E. R., & Fishbach, A. (2016). Motivational tuning in response to ego depletion. In E. R. Hirt, J. J. Clarkson, & L. Jia (Eds.), *Self-regulation and ego control*. (pp. 143–164). San Diego, CA: Elsevier Academic Press.
- Job, V., Dweck, C. S., & Walton, G. M. (2010). Ego depletion—Is it all in your head? Implicit theories about willpower affect self-regulation. *Psychological Science*, 21, 1686-1693. doi:10.1177/0956797610384745
- Jodl, K. M., Michael, A., Malanchuk, O., Eccles, J. S., & Sameroff, A. (2001). Parents' roles in shaping early adolescents' occupational aspirations. *Child Development*, 72, 1247–1265. https://doi.org/10.1111/1467-8624.00345
- Judge, T. A., Bono, J. E., Erez, A., & Locke, E. A. (2005). Core self-evaluations and job and life satisfaction: the role of self-concordance and goal attainment. *Journal of Applied Psychology*, 90, 257-268. doi:10.1037/0021-9010.90.2.257
- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 280–287. doi: 10.1177/0146167296223006

Kauffman, D. F. H. (2004). Effects of Time Perspective on Student Motivation: Introduction to a Special Issue. *Educational Psychology Review*, 16, 1–7.

doi:10.1023/B:EDPR.0000012342.37854.58

Keijsers, L., Loeber, R., Branje, S., & Meeus, W. (2011). Bidirectional links and concurrent development of parent-child relationships and boys' offending behavior. *Journal of Abnormal Psychology*, *120*, 878-889. doi: 10.1037/a0024588

- Keren, G. (2013). A tale of two systems: A scientific advance or a theoretical stone soup?
 Commentary on Evans & Stanovich (2013). *Perspectives on Psychological Science*, 8, 257–262. https://doi.org/10.1177/1745691613483474
- Khan, U., & Dhar, R. (2006). Licensing effect in consumer choice. *Journal of Marketing Research*, 43, 259–266. doi:10.1509/jmkr.43.2.259
- Kline, R.B. (2011). *Principles and practice of structural equation modeling*. Guilford Press, New York.
- Koestner, R., Lekes, N., Powers, T. A., & Chicoine, E. (2002). Attaining personal goals: Selfconcordance plus implementation intentions equals success. *Journal of Personality and Social Psychology*, 83, 231–244. doi:10.1037/0022-3514.83.1.231
- Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality*, 76, 1201– 1230. doi:10.1111/j.1467-6494.2008.00519.x
- Kool, W., McGuire, J. T., Wang, G. J., & Botvinick, M. M. (2013). Neural and behavioral evidence for an intrinsic cost of self-control. *PLoS One*, 8, e72626. doi: 10.1371/journal.pone.0072626
- Kosovich, J. J., Hulleman, C. S., Barron, K. E., & Getty, S. (2015). A practical measure of student motivation: Establishing validity evidence for the expectancy-value-cost scale in middle school. *The Journal of Early Adolescence*, *35*, 790–816. doi:10.1177/0272431614556890
- Kotabe, H. P., & Hofmann, W. (2015). On integrating the components of self-control. *Perspectives on Psychological Science*, *10*, 618–638. doi:10.1177/1745691615593382
- Kracke, B. (2002). The role of personality, parents and peers in adolescents career exploration. *Journal of Adolescence*, 25, 19–30. doi:10.1006/jado.2001.0446
- Krajbich, I., Lu, D., Camerer, C., & Rangel, A. (2012). The attentional drift-diffusion model extends to simple purchasing decisions. *Frontiers in Psychology*, *3*, 1-18. doi:10.3389/fpsyg.2012.00193
- Krajbich, I., & Rangel, A. (2011). Multialternative drift-diffusion model predicts the relationship between visual fixations and choice in value-based decisions. *Proceedings of the National Academy of Sciences*, 108, 13852–13857.
 https://doi.org/10.1073/pnas.1101328108
- Kraus, M. W., & Keltner, D. (2009). Signs of socioeconomic status: A thin-slicing approach. *Psychological Science*, *20*, 99-106. doi: 10.1111/j.1467-9280.2008.02251.x
- Kruglanski, A. W. (2013). Only one? The default interventionist perspective as a unimodel—
 Commentary on Evans & Stanovich (2013). *Perspectives on Psychological Science*, 3, 242–247. https://doi.org/10.1177/1745691613483477
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D.
 (2002). A theory of goal systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, Vol. 34. (pp. 331–378). San Diego, CA: Academic Press.
- Kuhl, J. (1987). Action control: The maintenance of motivational states. In F. Halisch & J. Kuhl(Eds.), *Motivation, intention, and volition* (pp. 279-291). Berlin, Heidelberg: Springer..
- Kurzban, R., Duckworth, A., Kable, J. W., & Myers, J. (2013). An opportunity cost model of subjective effort and task performance. *Behavioral and Brain Sciences*, *36*, 661–679. doi:10.1017/S0140525X12003196

- Landau, M. J., Oyserman, D., Keefer, L. A., & Smith, G. C. (2014). The college journey and academic engagement: How metaphor use enhances identity-based motivation. *Journal of Personality and Social Psychology*, *106*, 679–698. doi: 10.1037/a0036414
- Leduc-Cummings, I., Milyavskaya, M., & Peetz, J. (2017). Goal motivation and the subjective perception of past and future obstacles. *Personality and Individual Differences*, 109, 160– 165. https://doi.org/10.1016/j.paid.2016.12.052
- Lee, M., & Bong, M. (2016). In their own words: Reasons underlying the achievement striving of students in schools. *Journal of Educational Psychology*, 108, 274-294. doi:10.1037/edu0000048
- Lent, R. W., & Worthington, R. L. (1999). Applying career development theories to the schoolto-work transition process. *The Career Development Quarterly*, 47, 291–296. https://doi.org/10.1002/j.2161-0045.1999.tb00738.x

Lewin, K. (1935). A dynamic theory of personality. New York: McGraw-Hill.

- Lewis Jr, N. A., & Oyserman, D. (2015). When does the future begin? Time metrics matter, connecting present and future selves. *Psychological Science*, 26, 816–825. doi:10.1177/0956797615572231
- Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment* and Behavior, 15, 273–309. https://doi.org/10.1177%2F0013916583153002
- Lurquin, J. H., & Miyake, A. (2017). Challenges to Ego-Depletion Research Go beyond the Replication Crisis: A Need for Tackling the Conceptual Crisis. *Frontiers in Psychology*, 8, 1-5. doi: 10.3389/fpsyg.2017.0056
- Markus, H. R., & Nurius, P. (1986). Possible selves. *American Psychologist*, *41*, 954–969. doi:10.1037/0003-066X.41.9.954

- Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology*, *38*, 299–337. doi: 10.1146/annurev.ps.38.020187.001503
- Maslow, A. H. (1963). The need to know and the fear of knowing. *The Journal of General Psychology*, 68, 111-125. doi: 10.1080/00221309.1963.9920516
- McAdams, D. P., & Olson, B. D. (2010). Personality development: Continuity and change over the life course. *Annual Review of Psychology*, 61, 517–542. https://doi.org/10.1146/annurev.psych.093008.100507
- McClelland, D. C. (1965). Toward a theory of motive acquisition. *American Psychologist*, 20, 321-333. doi:10.1037/h0022225
- Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: dynamics of willpower. *Psychological Review*, *106*, 3-19. doi: 0033-295X.106.1.3
- Michou, A., Vansteenkiste, M., Mouratidis, A., & Lens, W. (2014). Enriching the hierarchical model of achievement motivation: Autonomous and controlling reasons underlying achievement goals. British Journal of Educational Psychology, 84, 650–666.
 doi:10.1111/bjep.12055
- Milyavskaya, M., & Inzlicht, M. (2016). Attentional and motivational mechanisms of self-control. In D. de Ridder, M. Adriaanse, & K. Fujita (Eds.), *The Routledge International Handbook of Self-control in Health and Well-being*. (pp. 11–23). New York, NY: Routledge/Taylor & Francis Group.
- Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying "no" to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by

increasing self-control. *Journal of Personality and Social Psychology*, *109*, 677–693. doi:10.1037/pspp0000045

Mischel, W., Shoda, Y., & Rodriguez, M. I. (1989). Delay of gratification in children. *Science*, 244, 933-938. doi: 10.1126/science.2658056

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., ... Caspi,
A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *PNAS Proceedings of the National Academy of Sciences of the United States of America,* 108, 2693–2698. doi: 10.1073/pnas.1010076108

- Molden, D. C., Hui, C. M., & Scholer, A. A. (2016). Understanding self-regulation failure: A motivated effort-allocation account. In E. R. Hirt, J. J. Clarkson, & L. Jia (Eds.), *Self-Fegulation and Ego Control.* (pp. 425–459). San Diego, CA: Elsevier Academic Press.
- Moller, A. C., Deci, E. L., & Ryan, R. M. (2006). Choice and ego-depletion: The moderating role of autonomy. *Personality and Social Psychology Bulletin*, *32*, 1024–1036. doi:10.1177/0146167206288008
- Mormann, M. M., Malmaud, J., Huth, A., Koch, C., & Rangel, A. (2010). The drift diffusion model can account for the accuracy and reaction time of value-based choices under high and low time pressure. *Judgement and Decision Making*, *5*, 437-439. http://dx.doi.org/10.2139/ssrn.1901533
- Morris, J. K., Cook, D. G., & Shaper, A. G. (1994). Loss of employment and mortality. *BMJ*, 308, 1135–1139. https://doi.org/10.1136/bmj.308.6937.1135
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources:
 Does self-control resemble a muscle? *Psychological Bulletin*, *126*, 247-259.
 doi:10.1037/0033-2909.126.2.247

 Muraven, M., & Slessareva, E. (2003). Mechanisms of self-control failure: Motivation and limited resources. *Personality and Social Psychology Bulletin*, 29, 894–906. doi:10.1177/0146167203029007008

Nagy, G., Köller, O., & Heckhausen, J. (2005). Der Übergang von der Schule in die berufliche Erstausbildung: Wer die Sorgen scheut, wird von ihnen ereilt = The transition from school to vocational education: Avoiding worry does not pay. *Zeitschrift Für Entwicklungspsychologie Und Pädagogische Psychologie, 37*, 156–167. doi:10.1026/0049-8637.37.3.156

- Nurmi, J. E., & Salmela-Aro, K. (2002). Goal construction, reconstruction, and depressive symptoms in a life-span context: The transition from school to work. *Journal of Personality*, 70, 385–420. doi: 10.1111/1467-6494.05009
- Nurra, C., & Oyserman, D. (2018). From future self to current action: An identity-based motivation perspective. *Self and Identity*, *17*, 343–364. https://doi.org/10.1080/15298868.2017.1375003
- O'Keefe, P. A., Dweck, C. S., & Walton, G. M. (2018). Implicit theories of interest: Finding your passion or developing it? *Psychological Science*, 29, 1653–1664. doi: 10.1177/0956797618780643
- Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology*, 91, 188-204. doi:10.1037/0022-3514.91.1.188
- Oyserman, D., & Destin, M. (2010). Identity-based motivation: Implications for intervention. *The Counseling Psychologist*, 38, 1001–1043. doi: 10.1177/0011000010374775

- Oyserman, D., Destin, M., & Novin, S. (2015). The context-sensitive future self: Possible selves motivate in context, not otherwise. *Self and Identity*, *14*, 1–16. doi:10.1080/15298868.2014.965733.
- Oyserman, D., Elmore, K., & Smith, G. (2012). Self, self-concept, and identity. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of Self and Identity* (pp. 69–104). New York: Guilford Press.
- Oyserman, D., & James, L. (2009). Possible selves: From content to process. In K. D. Markman,
 W. M. P. Klein, & J. A. Suhr (Eds.), *Handbook of Imagination and Mental Simulation*(pp. 373-394). New York, NY, US: Psychology Press.
- Oyserman D., James L. (2011) Possible Identities. In: Schwartz S., Luyckx K., Vignoles V. (eds) Handbook of Identity Theory and Research. Springer, New York, NY
- Oyserman, D., Lewis Jr, N. A., Yan, V. X., Fisher, O., O'Donnell, S. C., & Horowitz, E. (2017). An identity-based motivation framework for self-regulation. *Psychological Inquiry*, 28, 139–147. https://doi.org/10.1080/1047840X.2017.1337406
- Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015).
 Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science*, 26, 784–793. doi: 10.1177/0956797615571017
- Pennebaker, J. W., Francis, M. E., & Booth, R. J. (20015). Linguistic inquiry and word count: LIWC 2015. *Mahway: Lawrence Erlbaum Associates*.
- Pinquart, M., Juang, L. P., & Silbereisen, R. K. (2003). Self-efficacy and successful school-towork transition: A longitudinal study. *Journal of Vocational Behavior*, 63, 329–346. doi:10.1016/S0001-8791(02)00031-3

- Poulin, M. J., & Heckhausen, J. (2007). Stressful events compromise control strivings during a major life transition. *Motivation and Emotion*, 31, 300–311. doi:10.1007/s11031-007-9077-6
- Roberts, B. W., Walton, K., Bogg, T., & Caspi, A. (2006). De-investment in work and nonnormative personality trait change in young adulthood. *European Journal of Personality*. 20, 461–474. doi: 10.1002/per.607
- Salmela-Aro, K. (2009). Personal goals and well-being during critical life transitions: The four C's—Channelling, choice, co-agency and compensation. *Advances in Life Course Research*, 14, 63–73. doi: 10.1016/j.alcr.2009.03.003
- Schafer, R. (1968). *Aspects of internalization*. Madison, CT, US: International Universities Press, Inc.
- Schoon, I., & Silbereisen, R. K. (2009). Transitions from school to work: Globalization, individualization, and patterns of diversity. New York, NY, US: Cambridge University Press.
- Schulenberg, J. E., Bryant, A. L., & O'malley, P. M. (2004). Taking hold of some kind of life: How developmental tasks relate to trajectories of well-being during the transition to adulthood. *Development and Psychopathology*, *16*, 1119–1140. doi: 10.1017/S0954579404040167
- Senko, C., & Tropiano, K. L. (2016). Comparing three models of achievement goals: Goal orientations, goal standards, and goal complexes. *Journal of Educational Psychology*, 108, 1178-1192. doi:10.1037/edu0000114

Shane, J., & Heckhausen, J. (2013). University students' causal conceptions about social mobility: Diverging pathways for believers in personal merit and luck. *Journal of Vocational Behavior*, 82, 10–19. doi: 10.1016/j.jvb.2012.08.003

Sheldon, K. M., & Elliot, A. J. (1998). Not all personal goals are personal: Comparing autonomous and controlled reasons for goals as predictors of effort and attainment. *Personality and Social Psychology Bulletin*, 24, 546–557. doi:10.1177/0146167298245010

- Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal wellbeing: the self-concordance model. *Journal of Personality and Social Psychology*, 76, 482-497. doi:10.1037/0022-3514.76.3.482.
- Sheldon, K. M., Elliot, A. J., Ryan, R. M., Chirkov, V., Kim, Y., Wu, C., Demir, M., & Sun, Z. (2004). Self-concordance and subjective well-being in four cultures. *Journal of Cross-Cultural Psychology*, 35, 209–223. doi: 10.1177/0022022103262245
- Sheldon, K. M., & Houser-Marko, L. (2001). Self-concordance, goal attainment, and the pursuit of happiness: Can there be an upward spiral? *Journal of Personality and Social Psychology*, 80, 152-165. doi:10.1037/0022-3514.80.1.152
- Shenhav, A. (2017). The perils of losing control: Why self-control is not just another value-based decision. *Psychological Inquiry*, 28, 148–152.

https://doi.org/10.1080/1047840X.2017.1337407

Shiv, B., & Fedorikhin, A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research*, 26, 278–292. doi:10.1086/209563

- Shulman, S., & Nurmi, J.-E. (2010). Understanding emerging adulthood from a goal-setting perspective. *New Directions for Child and Adolescent Development*, 2010, 1–11. doi: 10.1002/cd.277
- Simpkins, S. D., Davis-Kean, P. E., & Eccles, J. S. (2006). Math and science motivation: A longitudinal examination of the links between choices and beliefs. *Developmental Psychology*, 42, 70–83. doi:10.1037/0012-1649.42.1.70.
- Simpkins, S. D., Fredricks, J. A., & Eccles, J. S. (2012). Charting the Eccles' expectancy-value model from mothers' beliefs in childhood to youths' activities in adolescence. *Developmental Psychology*, 48, 1019–1032. doi:10.1037/a0027468.
- Sklar, A. Y., & Fujita, K. (2017). On when and how identity value impacts self-control decisions. *Psychological Inquiry*, 28, 153–156. doi:10.1080/1047840X.2017.1337409
- Sommet, N., & Elliot, A. J. (2017). Achievement goals, reasons for goal pursuit, and achievement goal complexes as predictors of beneficial outcomes: Is the influence of goals reducible to reasons? *Journal of Educational Psychology*, *109*, 1141–1162. doi:10.1037/edu0000199
- Stephens, N. M., Fryberg, S. A., Markus, H. R., Johnson, C. S., & Covarrubias, R. (2012).
 Unseen disadvantage: How American universities' focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, *102*, 1178–1197. doi: 10.1037/a0027143
- Sullivan, N., Hutcherson, C., Harris, A., & Rangel, A. (2015). Dietary self-control is related to the speed with which attributes of healthfulness and tastiness are processed.
 Psychological Science, 26, 122–134. https://doi.org/10.1177/0956797614559543

- Svoboda, R. C., Rozek, C. S., Hyde, J. S., Harackiewicz, J. M., & Destin, M. (2016).
 Understanding the relationship between parental education and STEM course taking through identity-based and expectancy-value theories of motivation. *AERA Open*, *2*, 1-13. doi: 10.1177/2332858416664875.
- Svoboda, R.C., Destin, M., & Haase, C.M. (revise and resubmit). The activation, motivation, and pursuit (AMP) process for self-control: Future identity as a source of self-control.
- Svoboda, R. C., Heckhausen, J., Silbereisen, R. K., & Haase, C. M. (under review). Passion or pursuit? Career goal self-concordance, goal engagement, and success during the transition from university to work.
- Swann, W. B., & Read, S. J. (1981). Self-verification processes: How we sustain our selfconceptions. *Journal of Experimental Social Psychology*, 17, 351–372. https://doi.org/10.1016/0022-1031(81)90043-3
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72, 271–322. doi:10.1111/j.0022-3506.2004.00263.x
- Thompson, V. A. (2013). Why it matters: The implications of autonomous processes for dual process theories—Commentary on Evans & Stanovich (2013). *Perspectives on Psychological Science*, 8, 253–256. https://doi.org/10.1177/1745691613483476
- Thush, C., Wiers, R. W., Ames, S. L., Grenard, J. L., Sussman, S., & Stacy, A. W. (2008). Interactions between implicit and explicit cognition and working memory capacity in the prediction of alcohol use in at-risk adolescents. *Drug and Alcohol Dependence*, 94(1–3), 116–124. https://doi.org/10.1016/j.drugalcdep.2007.10.019

- Tomasik, M. J., Hardy, S., Haase, C. M., & Heckhausen, J. (2009). Adaptive adjustment of vocational aspirations among German youths during the transition from school to work. *Journal of Vocational Behavior*, 74, 38–46. doi: 10.1016/j.jvb.2008.10.003
- Trope, Y., & Fishbach, A. (2000). Counteractive self-control in overcoming temptation. *Journal* of Personality and Social Psychology, 79, 493-506. doi:10.1037/0022-3514.79.4.493
- Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, 117, 440-463. doi:10.1037/a0018963
- Updegraff, K. A., Eccles, J. S., Barber, B. L., & O'brien, K. M. (1996). Course enrollment as self-regulatory behavior: Who takes optional high school math courses? *Learning and Individual Differences*, 8, 239–259. doi: 10.1016/S1041-6080(96)90016-3
- Urdan, T., & Mestas, M. (2006). The goals behind performance goals. *Journal of Educational Psychology*, 98, 354-365. doi:10.1037/0022-0663.98.2.354
- Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review*, 94, 3-15. doi:10.1037/0033-295X.94.1.3
- Vallerand, R. J. (2010). On passion for life activities: The dualistic model of passion. Advances in Experimental Social Psychology, 42, 97-193. https://doi.org/10.1016/S0065-2601(10)42003-1
- Vallerand, R. J., & Houlfort, N. (2003). Passion at work. In S.W. Gilliland, D. D. Steiner, & D.
 P. Skarlicki (Eds.), *Emerging perspectives on values in organizations*(pp.175-204),
 Greenwich, CT, US: Information Age Publishing.
- Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., & Matos, L. (2005). Examining the motivational impact of intrinsic versus extrinsic goal framing and autonomy-supportive

versus internally controlling communication style on early adolescents' academic achievement. *Child Development*, *76*, 483–501. doi:10.1111/j.1467-8624.2005.00858.x

- Vasalampi, K., Salmela-Aro, K., & Nurmi, J.-E. (2009). Adolescents' self-concordance, school engagement, and burnout predict their educational trajectories. *European Psychologist*, 14(4), 332–341. doi: 10.1027/1016-9040.14.4.332
- Von Wachter, T., & Bender, S. (2006). In the right place at the wrong time: The role of firms and luck in young workers' careers. *American Economic Review*, 96, 1679–1705. doi: 10.1257/aer.96.5.1679
- Vroom, V. H. (1964). Work and motivation. Oxford, England: Wiley.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331, 1447–1451. https://doi.org/10.1126/science.1198364
- Walton, G. M., & Wilson, T. D. (2018). Wise interventions: Psychological remedies for social and personal problems. *Psychological Review*, 125, 617-655. http://dx.doi.org/10.1037/rev0000115
- Werner, K. M., & Milyavskaya, M. (2019). Motivation and self-regulation: The role of want-to motivation in the processes underlying self-regulation and self-control. *Social and Personality Psychology Compass*, 13, 1-14. doi: 10.1111/spc3.12425
- Werner, K. M., Milyavskaya, M., Foxen-Craft, E., & Koestner, R. (2016). Some goals just feel easier: Self-concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences*, 96, 237–242. doi:10.1016/j.paid.2016.03.002.

- Whitney, P., Hinson, J. M., & Jameson, T. L. (2006). From executive control to self-control: predicting problem drinking among college students. *Applied Cognitive Psychology*, 20, 823–835. https://doi.org/10.1002/acp.1230
- Wicklund, R. A., & Gollwitzer, P. M. (2013). *Symbolic Self-Completion*. Hillsdale, New Jersey: Routledge.
- Wiese, B. S., Freund, A. M., & Baltes, P. B. (2002). Subjective career success and emotional well-being: Longitudinal predictive power of selection, optimization, and compensation. *Journal of Vocational Behavior*, 60, 321–335. doi:10.1006/jvbe.2001.1835
- Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes. *Developmental Review*, 30, 1–35. doi:10.1016/j.dr.2009.12.001
- Wrosch, C., Dunne, E., Scheier, M. F., & Schulz, R. (2006). Self-regulation of common agerelated challenges: Benefits for older adults' psychological and physical health. *Journal* of Behavioral Medicine, 29, 299–306. doi:10.1007/s10865-006-9051-x
- Wrosch, C., Schulz, R., & Heckhausen, J. (2002). Health stresses and depressive symptomatology in the elderly: the importance of health engagement control strategies. *Health Psychology*, 21, 340-348. http://dx.doi.org/10.1037/0278-6133.21.4.340
- Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research*, 81, 267–301. https://doi.org/10.3102/0034654311405999

Appendices

Chapter 2 Appendices

Appendix A2 - 1. Test of model fit between unconstrained versus constrained cross-lagged models

	df	AIC	BIC	γ^2	$\gamma^2 diff$	df diff	p
Unconstrained: SC and CGP	6	14633	14936	7.93			F
Constrained: SC and CGP	12	14647	14924	33.79	25.86	6	<.001***
Unconstrained: SC and CS	6	12320	12623	12.09			
Constrained: SC and CS	12	12319	12596	22.53	10.44	6	0.11
Unconstrained: GE and CGP	6	11378	11681	4.03			
Constrained: GE and CGP	12	11368	11645	5.99	1.96	6	0.92
Unconstrained: GE and CS	6	9085	9387	5.90			
Constrained: GE and CS	12	9358	9358	14.27	8.37	6	0.21
Unconstrained: SC and GE	6	9541	9844	3.33			
Constrained: SC and GE	12	9536	9813	10.39	7.06	6	0.32

Note. df = degrees of freedom in each model. AIC = Akaike information criterion. BIC = Baseyian criterion information. χ^2 = Chi-square test of model fit statistic for each model. $\chi^2 diff$ = Chi-square statistic for the difference between two models. df diff = Degree of freedom difference between two models. p = p-value. Unconstrained model refers to a model where the cross-lag and correlated change paths were estimated freely. Constrained model refers to a model where the concordance, GE = goal engagement, CGP = career goal progress, and CS = career satisfaction. One test of model fit was significant: SC and CGP. Despite these significant results, we report the constrained model. In addition, both constrained models still showed adequate fit. SC and CGP constrained model: $\chi 2(12) = 33.79$, p = .001, CFI = .97, RMSEA = .06. *** indicates p < .001.

	В	SE(B)	Z.	р	beta
<u>SC T4</u>					
GP T3	0.02	0.02	0.78	.433	0.06
SC T3	0.32	0.05	6.04	.000	0.36
SC T2	0.16	0.06	2.75	.006	0.16
SC T1	0.20	0.06	3.49	.000	0.21
Parental education	0.02	0.03	0.73	.468	0.03
Gender	-0.24	0.12	-1.95	.052	-0.09
Major	0.01	0.12	0.07	.948	-0.00
<u>GP T4</u>					
SC T3	0.08	0.02	3.34	.001	0.10
GP T3	0.41	0.06	7.40	.000	0.43
GP T2	0.08	0.07	1.29	.198	0.08
GP T1	0.10	0.06	1.88	.060	0.11
Parental education	-0.01	0.06	-0.22	.829	-0.01
Gender	0.26	0.24	1.07	.286	0.05
Major	0.07	0.23	0.29	.771	0.02
<u>SC T3</u>					
GP T2	0.02	0.02	0.78	.433	0.06
SC T2	0.34	0.06	5.34	.000	0.31
SC T1	0.39	0.06	6.29	.000	0.36

Appendix A2 - 2. Full regression results from cross-lagged model between self-concordance, career goal progress, and covariates.

	В	SE(B)	Ζ.	р	beta
Parental education	0.01	0.04	0.33	.742	0.01
Gender	-0.05	0.14	-0.32	.748	-0.02
Major	-0.06	0.13	-0.47	.642	-0.03
<u>GP T3</u>					
SC T2	0.08	0.02	3.34	.001	0.10
GP T2	0.39	0.06	6.66	.000	0.37
GP T1	0.14	0.06	2.40	.016	0.14
Parental education	-0.03	0.06	-0.48	.633	-0.02
Gender	-0.24	0.24	-0.97	.333	-0.04
Major	0.67	0.23	2.93	.003	0.14
<u>SC T2</u>					
GP T1	0.08	0.02	3.34	.001	0.10
SC T1	0.45	0.05	9.47	.000	0.48
Parental education	0.03	0.03	0.80	.425	0.04
Gender	-0.05	0.14	-0.38	.707	-0.01
Major	-0.34	0.13	-2.73	.006	-0.12
<u>GP T2</u>					
SC T1	0.02	0.02	0.78	.433	0.06
GP T1	0.43	0.05	9.46	.000	0.44
Parental education	0.02	0.06	0.38	.701	0.02

	В	SE(B)	Z.	р	beta
Gender	-0.06	0.25	-0.23	.819	-0.01
Major	0.42	0.23	1.81	.070	0.09

Note. N = 523. T1 = graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, and T4 = 1 year after graduation. SC = self-concordance and GP = career goal progress. *B* indicates unstandardized regression weights. *SE*(*B*) indicates the standard error of the unstandardized regression weight. *z* indicates the z-score. *p* indicates the p-value. *beta* indicates the standardized regression weights.

	В	SE(B)	Z.	р	beta
<u>SC T4</u>					
CS T3	-0.04	0.03	-1.26	.208	-0.04
SC T3	0.35	0.05	6.81	.000	0.39
SC T2	0.17	0.06	2.99	.003	0.17
SC T1	0.19	0.06	3.28	.001	0.20
Parental education	0.02	0.03	0.66	.509	0.03
Gender	-0.24	0.12	-1.99	.046	-0.09
Major	0.04	0.11	0.38	.705	0.02
<u>CS T4</u>					
SC T3	0.12	0.02	4.76	.000	0.14
CS T3	0.42	0.05	8.23	.000	0.46
CS T2	0.08	0.05	1.41	.157	0.09
CS T1	-0.05	0.06	-0.80	.426	-0.05
Parental education	-0.01	0.03	-0.37	.713	-0.02
Gender	-0.17	0.11	-1.55	.122	-0.08
Major	0.19	0.11	1.76	.079	0.09
<u>SC T3</u>					
CS T2	-0.04	0.03	-1.26	.208	-0.04
SC T2	0.36	0.06	5.78	.000	0.33
SC T1	0.39	0.06	6.24	.000	0.36

Appendix A2 - 3. Full regression results from cross-lagged model between self-concordance, career satisfaction, and covariates

	В	SE(B)	z	р	beta
Parental education	0.01	0.04	0.41	.683	0.02
Gender	-0.04	0.14	-0.29	.770	-0.01
Major	-0.03	0.13	-0.22	.828	-0.01
<u>CS T3</u>					
SC T2	0.12	0.02	4.76	.000	0.14
CS T2	0.32	0.05	5.82	.000	0.33
CS T1	0.19	0.06	3.19	.001	0.20
Parental education	0.01	0.03	0.42	.674	0.02
Gender	0.09	0.12	0.76	.448	0.04
Major	0.10	0.11	0.88	.381	0.04
<u>SC T2</u>					
CS T1	-0.04	0.03	-1.26	.208	-0.04
SC T1	0.51	0.05	11.06	.000	0.53
Parental education	0.03	0.03	0.88	.378	0.04
Gender	0.01	0.14	0.10	.923	0.00
Major	-0.22	0.12	-1.76	.078	-0.08
<u>CS T2</u>					
SC T1	0.12	0.02	4.76	.000	0.14
CS T1	0.35	0.05	6.33	.000	0.34
Parental education	0.08	0.03	2.51	.012	0.12

	В	SE(B)	Z.	р	beta
Gender	0.07	0.13	0.54	.590	0.03
Major	0.36	0.12	2.98	.003	0.15

Note. N = 523. T1 = graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, and T4 = 1 year after graduation. SC = self-concordance and CS = career satisfaction. *B* indicates unstandardized regression weights. *SE*(*B*) indicates the standard error of the unstandardized regression weight. *z* indicates the z-score. *p* indicates the p-value. *beta* indicates the standardized regression weights.

Appendix A2 - 4. Logistic and linear regression results for employment (or income) at T4 as function of self-concordance (or goal engagement) at T1 and covariates

		В			OR
Predictor	В	95% CI	SE(B)	OR	95% CI
		[LL, UL]			[LL, UL]
(Intercept)	1.16	[-0.61,3.11]			
Self- concordance	0.16	[-0.11, 0.43]	0.14	1.18	[0.89, 1.53]
Parental education	-0.06	[-0.46, 0.31]	0.20	0.94	[0.63, 1.37]
Major	0.92	[0.11, 1.79]	0.43	2.52	[1.11, 6.01]
Gender	0.51	[-0.41, 1.56]	0.50	1.66	[0.66, 4.76]

Logistic regression results of employment at T4 as a function of self-concordance at T1 and covariates.

Note. N = 266. T1 = graduation, T4 = 1 year after graduation. Sample includes only those participants who were employed at T4. *B* represents unstandardized regression weights. *SE*(*B*) represents standard error of unstandardized regression coefficient. *OR* indicates the odds ratio. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * indicates p < .05. ** indicates p < .01.

		В			OR
Predictor	В	95% CI	SE(B)	OR	95% CI
		[LL, UL]			[LL, UL]
(Intercept)	-1.46	[-5.79, 2.95]			
Goal engagement	0.88*	[0.15, 1.62]	0.38	2.42	[1.16, 5.15]
Parental education	-0.02	[-0.28, 0.21]	0.12	0.98	[0.75, 1.23]
Major	0.80	[-0.01, 1.65]	0.42	2.23	[0.99, 5.20]
Gender	0.58	[-0.32, 1.60]	0.48	1.79	[0.72, 4.93]

Logistic regression results of employment at T4 as a function of goal engagement at T1 and covariates.

Note. N = 266. T1 = graduation, T4 = 1 year after graduation. Sample includes only those participants who were employed at T4. *B* represents unstandardized regression weights. *SE*(*B*) represents standard error of unstandardized regression coefficient. *OR* indicates the odds ratio. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * indicates p < .05. ** indicates p < .01.

Predictor	В	<i>B</i> 95% CI	SE(B)	beta	<i>beta</i> 95% CI	Fit
(Intercept)	6.80**	[6.42, 7.17]			[LL, UL]	
Self- concordance	0.01	[-0.03, 0.05]	0.02	0.02	[-0.08, 0.12]	
Parental education	0.00	[-0.03, 0.03]	0.01	0.01	[-0.09, 0.11]	
Major	0.71**	[0.60, 0.81]	0.05	0.66	[0.56, 0.76]	
Gender	0.10	[-0.01, 0.21]	0.06	0.09	[-0.01, 0.19]	
					-	$R^2 = .472^{**}$ 95% CI [.37,.54]

Regression results of income at T4 as a function of self-concordance at T1 and covariates.

Note. N = 225. Income was log transformed prior to analysis. T1 = graduation, T4 = 1 year after graduation. Sample includes only those participants who were employed at T4. *B* represents unstandardized regression weights. *SE*(*B*) represents standard error of unstandardized regression coefficient. *beta* indicates the standardized regression weights. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * indicates p < .05. ** indicates p < .01.

		В			beta	
Predictor	В	95% CI	SE(B)	beta	95% CI	Fit
		[LL, UL]			[LL, UL]	
(Intercept)	6.61**	[6.05, 7.16]				
Career goal engagement	0.06	[-0.05, 0.16]	0.02	0.05	[-0.04, 0.15]	
Parental education	0.00	[-0.03, 0.03]	0.01	0.01	[-0.09, 0.10]	
Major	0.70**	[0.59, 0.81]	0.05	0.65	[0.55, 0.75]	
Gender	0.11*	[0.00, 0.23]	0.06	0.10	[0.00, 0.21]	
						$R^2 = .475^{**}$ 95% CI [.37,.54]

Regression results of income at T4 as a function of goal engagement at T1 and covariates.

Note. N = 223. Income was log transformed prior to analysis. T1 = graduation, T4 = 1 year after graduation. Sample includes only those participants who were employed at T4. *B* represents unstandardized regression weights. *SE*(*B*) represents standard error of unstandardized regression coefficient. *beta* indicates the standardized regression weights. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * indicates p < .05. ** indicates p < .01.

	В	SE(B)	Z	р	beta
<u>GE T4</u>					
GP T3	-0.00	0.00	-0.57	.567	-0.01
GE T3	0.51	0.05	9.50	.000	0.53
GE T2	0.20	0.07	2.82	.005	0.20
GE T1	0.17	0.06	2.68	.007	0.17
Parental education	-0.00	0.01	-0.02	.985	-0.00
Gender	0.04	0.04	1.12	.262	0.04
Major	0.01	0.03	0.24	.809	0.01
<u>GP T4</u>					
GE T3	0.52	0.12	4.17	.000	0.12
GP T3	0.40	0.06	7.27	.000	0.43
GP T2	0.07	0.06	1.07	.283	0.07
GP T1	0.09	0.06	1.65	.099	0.10
Parental education	0.01	0.06	0.14	.893	0.01
Gender	0.34	0.24	1.40	.161	0.07
Major	0.09	0.22	0.42	.673	0.02
<u>GE T3</u>					
GP T2	-0.00	0.00	-0.57	.567	-0.01
GE T2	0.55	0.06	8.62	.000	0.54
GE T1	0.29	0.06	4.56	.000	0.28

Appendix A2 - 5. Full regression results from cross-lagged model between career goal engagement, career goal progress, and covariates

	В	SE(B)	z	р	beta
Parental education	-0.01	0.01	-0.73	.467	-0.02
Gender	-0.05	0.04	-1.31	.190	-0.05
Major	0.02	0.04	0.57	.568	0.02
<u>GP T3</u>					
GE T2	0.52	0.12	4.17	.000	0.12
GP T2	0.39	0.06	6.60	.000	0.38
GP T1	0.14	0.06	2.43	.015	0.15
Parental education	-0.01	0.06	-0.24	.811	-0.01
Gender	-0.17	0.24	-0.69	.490	-0.03
Major	0.66	0.23	2.91	.004	0.14
<u>GE T2</u>					
GP T1	-0.00	0.00	-0.57	.567	-0.01
GE T1	0.77	0.03	22.35	.000	0.78
Parental education	0.00	0.01	0.45	.654	0.02
Gender	-0.03	0.04	-0.85	.396	-0.03
Major	-0.04	0.04	-1.14	.252	-0.04
<u>GP T2</u>					
GE T1	0.52	0.12	4.17	.000	0.12
GP T1	0.40	0.05	8.57	.000	0.43
Parental education	0.04	0.06	0.65	.515	0.03

	В	SE(B)	Z.	р	beta
Gender	0.01	0.25	0.06	.955	0.00
Major	0.44	0.23	1.88	.060	0.09

Note. N = 523. T1 = graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, and T4 = 1 year after graduation. GE = goal engagement and GP = career goal progress. *B* indicates unstandardized regression weights. *SE*(*B*) indicates the standard error of the unstandardized regression weight. *z* indicates the z-score. *p* indicates the p-value. *beta* indicates the standardized regression weights.

	В	SE(B)	Z	р	beta
<u>GE T4</u>					
CS T3	0.01	0.01	0.89	.374	0.02
GE T3	0.51	0.05	9.53	.000	0.53
GE T2	0.20	0.07	2.97	.003	0.21
GE T1	0.15	0.06	2.46	.014	0.16
Parental education	-0.00	0.01	-0.13	.900	-0.00
Gender	0.04	0.04	1.05	.296	0.04
Major	0.00	0.03	0.10	.919	0.00
<u>CS T4</u>					
GE T3	0.23	0.06	3.77	.000	0.11
CS T3	0.41	0.05	8.01	.000	0.45
CS T2	0.07	0.06	1.26	.206	0.08
CS T1	-0.01	0.06	-0.10	.919	-0.01
Parental education	0.00	0.03	0.03	.977	0.00
Gender	-0.15	0.11	-1.36	.175	-0.07
Major	0.16	0.11	1.49	.135	0.07
<u>GE T3</u>					
CS T2	0.01	0.01	0.89	.374	0.02
GE T2	0.55	0.06	8.56	.000	0.53
GE T1	0.29	0.06	4.53	.000	0.28

Appendix A2 - 6. Full regression results from cross-lagged model between goal engagement, career satisfaction, and covariates

	В	SE(B)	Z.	р	beta
Parental education	-0.01	0.01	-0.83	.408	-0.03
Gender	-0.06	0.04	-1.38	.169	-0.05
Major	0.02	0.04	0.40	.692	0.01
<u>CS T3</u>					
GE T2	0.23	0.06	3.77	.000	0.11
CS T2	0.35	0.05	6.51	.000	0.37
CS T1	0.19	0.06	3.28	.001	0.21
Parental education	0.02	0.03	0.55	.581	0.03
Gender	0.11	0.12	0.94	.349	0.04
Major	0.07	0.11	0.59	.557	0.03
<u>GE T2</u>					
CS T1	0.01	0.01	0.89	.374	0.02
GE T1	0.77	0.03	22.30	.000	0.78
Parental education	0.01	0.01	0.48	.632	0.02
Gender	-0.04	0.04	-0.88	.377	-0.03
Major	-0.05	0.04	-1.42	.157	-0.05
<u>CS T2</u>					
GE T1	0.23	0.06	3.77	.000	0.11
CS T1	0.39	0.05	7.12	.000	0.38
Parental education	0.09	0.03	2.67	.008	0.13

	В	SE(B)	Z.	р	beta
Gender	0.08	0.13	0.59	.555	0.03
Major	0.35	0.12	2.86	.004	0.14

Note. N = 523. T1 = graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, and T4 = 1 year after graduation. GE = goal engagement and CS = career satisfaction. *B* indicates unstandardized regression weights. *SE*(*B*) indicates the standard error of the unstandardized regression weight. *z* indicates the z-score. *p* indicates the p-value. *beta* indicates the standardized regression weights.

	В	SE(B)	Z.	р	beta
<u>GE T4</u>					
SC T3	0.01	0.01	1.35	.177	0.03
GE T3	0.50	0.05	9.42	.000	0.52
GE T2	0.21	0.07	2.99	.003	0.21
GE T1	0.16	0.06	2.62	.009	0.16
Parental education	-0.00	0.01	-0.10	.921	-0.00
Gender	0.04	0.04	1.16	.247	0.04
Major	0.00	0.03	0.11	.913	0.00
<u>SC T4</u>					
GE T3	0.21	0.07	3.09	.002	0.09
SC T3	0.31	0.05	6.13	.000	0.36
SC T2	0.16	0.06	2.76	.006	0.16
SC T1	0.20	0.06	3.40	.001	0.21
Parental education	0.03	0.03	1.06	.287	0.04
Gender	-0.21	0.12	-1.72	.085	-0.08
Major	0.02	0.11	0.18	.861	0.01
<u>GE T3</u>					
SC T2	0.01	0.01	1.35	.177	0.03
GE T2	0.54	0.06	8.50	.000	0.53
GE T1	0.29	0.06	4.60	.000	0.28

Appendix A2-7. Full regression results from cross-lagged model between self-concordance, goal engagement, and covariates

	В	SE(B)	z	р	beta
Parental education	-0.01	0.01	-0.77	.443	-0.03
Gender	-0.05	0.04	-1.33	.184	-0.05
Major	0.02	0.04	0.59	.553	0.02
<u>SC T3</u>					
GE T2	0.21	0.07	3.09	.002	0.09
SC T2	0.33	0.06	5.32	.000	0.30
SC T1	0.40	0.06	6.47	.000	0.37
Parental education	0.02	0.04	0.61	.540	0.03
Gender	-0.01	0.14	-0.06	.950	-0.00
Major	-0.04	0.13	-0.34	.732	-0.01
<u>GE T2</u>					
SC T1	0.01	0.01	1.35	.177	0.03
GE T1	0.77	0.03	22.06	.000	0.77
Parental education	0.01	0.01	0.48	.633	0.02
Gender	-0.03	0.04	-0.81	.419	-0.03
Major	-0.05	0.04	-1.35	.178	-0.05
<u>SC T2</u>					
GE T1	0.21	0.07	3.09	.002	0.09
SC T1	0.50	0.05	10.49	.000	0.51
Parental education	0.04	0.04	1.06	.289	0.05

	В	SE(B)	Z.	р	beta
Gender	0.02	0.14	0.18	.858	0.01
Major	-0.25	0.12	-2.03	.042	-0.10

Note. N = 523. T1 = graduation, T2 = 4 months after graduation, T3 = 8 months after graduation, and T4 = 1 year after graduation. SC = self-concordance and GE = goal engagement. *B* indicates unstandardized regression weights. *SE*(*B*) indicates the standard error of the unstandardized regression weight. *z* indicates the z-score. *p* indicates the p-value. *beta* indicates the standardized regression weights.

Chapter 3 Appendices

Appendix A3 – 1. Sample responses to experimental conditions and study session example

Want-to Condition Samples

"I want to become a doctor because it allows me to combine my passion for helping people. It is important for me to work in a career that allows me to make a direct and positive impact on others. I also look forward to the challenge and feeling of accomplishment in being a doctor."

"I have always wanted to be a doctor since I was a child. I like to learn about things that pertain to medicine and the body. I want to help people. I think learning about bodily processes is interesting and exciting. I think it is a fun challenge to pursue. I will not feel accomplished if I do not become a doctor someday. I have always been interested in science and biology and want to apply it in a more physical and helpful way. People in my family have always supported my decision to become a doctor. I have shadowed the type of doctor I want to be and it made me happy and excited. It was very interesting and allowed me to see exactly what I want to do. I think my skillsets apply greatly to those needed by a doctor. Doctors make a good amount of money and I will be able to support my family."

"I want to become a doctor because becoming a doctor is important to who I want to be in the future. I want to help people though their sicknesses and save lives. I also want to help people avoid being sick. I want to be a doctor because I like being intellectually challenged, and I would feel accomplished at the end of my residency. I feel like I would be disappointed in myself if I gave up on being a doctor."

Have-to Condition Samples

"I have to become a doctor because I haven't thought of being anything else in ten years. I don't know what I would do if I did not become a doctor. I have already committed countless hours of my life shadowing doctors, doing research, and taking pre-med classes and I feel like this would be a waste if I did not go on to medical school. I want a career that will pay well and be very important."

"I have to become a doctor because I have always known that this is the career I want to pursue. I have never thought of anything I would want to do more than to become a doctor. I can't imagine myself doing anything else. When I think of myself in 15 years I can only see myself as a doctor."

"My parents want me to have a stable career that society will always need. I am also facing cultural pressures since African immigrant parents all want their children to become the same thing: doctors, lawyers, or engineers. I also feel pressure from my previous teachers since they pushed me to consider it since I was "good" at science and math."

Control Condition Samples

"Woke up around 7 A.M. and went to the gym and ran. After a pretty big breakfast I went to my first class at 9:30 A.M. After that I was hungry but decided to go to my next class first and then get lunch. After that I got Indian food at Tech Express and then did some homework. Then, I

went to Research Methods in Swift Hall followed by Psychopathology. After those classes I had an hour left until my physics Lab so went to the package center to grab something and then stopped by my dorm. I went to physics lab which lasted about two hours and then went to Sarg for dinner. I conversed with a few friends and went back to my dorm. I was really tired at this point and wanted to go to bed but I had so much homework so just took a twenty minute nap and then did half of my readings for psych. Then, my friend came over and gave me Korean pastries so I ate that and got a sugar rush so wasn't tired anymore. So I finished all my psych homework, did some internet shopping, went on social media, and then fell asleep."

"Yesterday morning, I woke up around 7:30am at home and went to coffee shop two blocks from my house. I got a coffee and did homework until about 9:30am. My homework including reading and then writing a short reading analysis. Then my sister came over for about 15 minutes. Me, my sister, and my mom got in the car and drove to a place for lunch and to watch the U of M MSU football game. After the game, we shopped and went to see the movie 'A Start is Born'. Then my mom and I came home and I did a little more homework. We went to dinner around 8:30 down the street from our house. When we came home, we started a new show on TV and then went to bed around midnight."

"Woke up around 8:15 am, and brushed my teeth, washed my face, and got dressed for the day. I walked across the street and went to work from 9:00am to 11:00am. At work, I did the daily tasks I was assigned, and made myself a cup of tea in the morning. After work was over, I went to Norris and attended a senior information session with a free lunch. I went to this information session from 12:00-1:30pm. After the information session, I went to the downstairs of Norris and exchanged some cash for some quarters to do laundry. After that, I picked up an absentee voting sticker, and then grabbed a table in the Norris Starbucks. Then, I spent about 2 hours working, studying for my MCAT by watching Kaplan test prep videos and taking notes. At 3:45pm, I walked from Norris to downtown Evanston to go do some work at the research lab I work in. From 4:00-6:30pm, I completed lab work and ran a participant."

Study Session Example (three of the ten MCAT questions and temptations used in actual study session)

FOOD

According to Erik Erikson, identity formations is intense during what stage of life?

- Adolescence
- Early adulthood
- Birth through 2 years
- Early Childhood

One distinguishing factor in a redox titration, as opposed to other titrations, is that it involves:

- The use of oxidation and reduction
- The determining of an unknown concentration in one reactant
- The use of a known concentration
- The quantitative analysis of a substance

If an object of mass 4 kg is suspended at a height of 5 meters on Earth and acceleration due to gravity is 9.8 meters per second squared, what is its potential energy?

- 150 J
- 216 J
- 142 J
- 196 J

This Food Quiz Will Determine Whether You Belong In The US Or Europe

Your Stance On These 20 Unpopular Foods Will Reveal Your Most Polarizing Quality



180
Appendix A3 - 2. Full regression results for outcomes as a function of experimental condition and covariates

	Attainment Value for Study Session		In	Intrinsic Value for Study Session			Utility Value for Study Session		
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р
(Intercept)	4.85	0.49	< 0.001	4.59	0.61	< 0.001	5.02	0.53	< 0.001
Have-to	0.10	0.31	0.754	-0.06	0.38	0.870	0.23	0.33	0.491
Control	-0.33	0.30	0.272	-0.01	0.37	0.988	-0.33	0.32	0.307
High School Test Score	0.26	0.13	0.057	-0.00	0.16	0.981	0.17	0.14	0.238
Parental Education	0.13	0.09	0.133	-0.06	0.11	0.592	0.16	0.09	0.092
Female	-0.19	0.29	0.153	-0.18	0.34	0.593	-0.33	0.30	0.272
Observations	111				110				110
R^2 / adjusted R^2	0.067	/ 0.032			0.007 / -0	.041			0.076 / 0.031

Perceived value for study sessions as a function experimental conditions and covariates.

	Time Spen Sess	t on Study sion	#	of Temp during S	otations C Study Ses	licked sion	# St	⁴ Correct tudy Ses	t on sion
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р
(Intercept)	335.21	105.76	0.002	0.86	0.59	0.150	6.12	0.59	< 0.001
Have-to	55.24	64.85	0.396	-0.21	0.36	0.559	- 0.07	0.36	0.838
Control	118.89	63.21	0.063	0.12	0.36	0.741	0.33	0.35	0.351
High School Test Score	2.92	27.67	0.916	-0.10	0.16	0.515	- 0.41	0.16	0.009
Female	-129.20	58.82	0.030	0.15	0.33	0.644	0.74	0.33	0.028
Parental Education	4.90	18.40	0.790	-0.08	0.10	0.446	0.05	0.10	0.658
Observations	110		110)			110		
R^2 / adjusted R^2	0.065 / 0.020		0.0	20 / -0.02	28		0.129	/ 0.087	

Behavioral outcomes for study session as a function of experimental condition and covariates.

	Attai	nment Va MCAT Quiz	alue for	Intrinsi N	c Value fo ICAT Quiz)r	Utili	ty Value MCAT Quiz	for
Predictors	В	SE(B)	р	В	SE(B)	р	b	SE(B)	р
(Intercept)	4.84	0.51	< 0.001	4.68	0.62	< 0.001	4.91	0.57	< 0.001
Have-to	0.32	0.31	0.311	-0.06	0.38	0.880	0.40	0.35	0.249
Control	-0.21	0.31	0.488	0.47	0.37	0.202	-0.33	0.34	0.328
High School Test Score	0.10	0.13	0.447	0.08	0.16	0.602	0.14	0.15	0.335
Female	0.06	0.29	0.843	-0.06	0.34	0.872	-0.20	0.31	0.525
Parental Education	0.01	0.09	0.870	-0.06	0.11	0.592	0.05	0.10	0.640
Observations	110			110		110)		
R^2 / adjusted R^2	0.037 /	-0.009		0.033 / -0	.014	0.0	61 / 0.01	16	

Perceived value for MCAT quiz as a function of experimental condition and covariates.

	Time Spent on M		CAT Quiz	AT Quiz # Correct on M		
Predictors	В	SE(B)	р	В	SE(B)	р
(Intercept)	647.31	75.71	< 0.001	12.56	1.58	< 0.001
Have-to	34.16	46.43	0.464	0.10	0.97	0.921
Control	9.12	45.25	0.841	0.44	0.94	0.641
High School Test Score	-0.13	19.81	0.995	-0.16	0.41	0.693
Female	41.34	42.11	0.329	-0.42	0.88	0.633
Parental Education	-36.13	13.17	0.007	0.29	0.27	0.293
Observations	110			110		
R^2 / adjusted R^2	0.088 / 0	.045		0.019 /	-0.029	

Behavioral outcomes for MCAT quiz as a function of experimental conditions and covariates.

		Obstacles			Effort			Progress		
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	
(Intercept)	4.82	0.59	< 0.001	5.41	0.51	< 0.001	4.87	0.47	< 0.001	
Have-to	0.85	0.36	0.021	0.41	0.31	0.193	0.02	0.29	0.943	
Control	0.72	0.35	0.043	0.60	0.30	0.052	0.32	0.28	0.256	
High School Test Score	0.19	0.15	0.229	-0.02	0.13	0.864	0.06	0.12	0.611	
Female	0.05	0.33	0.880	-0.09	0.28	0.761	-0.12	0.26	0.655	
Parental Education	0.03	0.10	0.749	-0.01	0.09	0.920	0.11	0.08	0.193	
Observations	110				110				110	
R ² / adjusted R ²	0.085	5 / 0.041			0.038	/ -0.008			0.028 / -0.019	

Self-reported outcomes as a function of experimental conditions and covariates.

	В	SE(B)	Z.	р	beta
# Correct					
Want-to vs. Have-to	-0.08	0.34	-0.22	.824	-0.02
Want-to vs. Control	0.21	0.33	0.63	.529	0.06
Attainment Value	-0.22	0.19	-1.15	.249	-0.19
Intrinsic Value	0.08	0.09	0.93	.352	0.08
Utility Value	0.11	0.19	0.59	.558	0.10
Age	0.23	0.12	1.92	.055	0.17
Gender	0.71	0.31	2.28	.023	0.20
Parental Education	0.03	0.10	0.31	.753	0.03
High School Test Score	-0.39	0.15	-2.58	.010	-0.25
Time Spent					
Want-to vs. Have-to	0.16	0.22	0.73	.464	0.08
Want-to vs. Control	0.48	0.22	2.18	.029	0.23
Attainment Value	0.17	0.13	1.33	.184	0.22
Intrinsic Value	0.10	0.06	1.62	.106	0.15

Structural equation model between experimental condition, perceived value for study session, and study session outcomes.

	В	SE(B)	Ζ.	р	beta
Utility Value	-0.05	0.12	-0.39	.699	-0.07
Age	-0.11	0.08	-1.39	.166	-0.13
Gender	-0.40	0.21	-1.92	.055	-0.18
Parental Education	0.01	0.07	0.21	.836	0.02
High School Test Score	-0.01	0.10	-0.11	.910	-0.01
<u># Distractions</u>					
Want-to vs. Have-to	-0.44	0.35	-1.26	.206	-0.13
Want-to vs. Control	0.05	0.34	0.14	.889	0.01
Attainment Value	-0.15	0.20	-0.74	.457	-0.13
Intrinsic Value	0.04	0.09	0.44	.663	0.04
Utility Value	0.17	0.19	0.91	.360	0.16
Age	-0.35	0.12	-2.94	.003	-0.27
Gender	0.38	0.33	1.15	.250	0.11
Parental Education	-0.08	0.10	-0.83	.406	-0.08
High School Test Score	-0.02	0.15	-0.16	.876	-0.02
<u>Attainment</u> <u>Value</u>					
Want-to vs. Have-to	0.10	0.30	0.34	.735	0.04

	В	SE(B)	Z.	р	beta
Want-to vs. Control	-0.28	0.30	-0.95	.344	-0.10
Age	-0.06	0.10	-0.60	.549	-0.06
Gender	-0.21	0.28	-0.76	.446	-0.07
Parental Education	0.15	0.09	1.68	.093	0.16
High School Test Score	0.28	0.13	2.11	.035	0.21
Utility Value					
Want-to vs. Have-to	0.26	0.32	0.82	.410	0.09
Want-to vs. Control	-0.28	0.31	-0.90	.367	-0.10
Age	-0.04	0.11	-0.35	.729	-0.03
Gender	-0.35	0.29	-1.21	.228	-0.11
Parental Education	0.17	0.09	1.90	.057	0.18
High School Test Score	0.16	0.14	1.20	.232	0.12
Intrinsic Value					
Want-to vs. Have-to	-0.01	0.36	-0.02	.988	-0.00
Want-to vs. Control	-0.02	0.35	-0.06	.954	-0.01
Age	0.19	0.12	1.57	.116	0.15
Gender	-0.25	0.33	-0.75	.451	-0.07

	В	SE(B	B) z	р	beta
Parental Education	-0.07	0.10	-0.69	.489	-0.07
High School Test Score	-0.03	0.15	-0.19	.847	-0.02
Intercepts					
# Correct	2.10	2.36	0.89	.373	-0.00
Time Spent	1.05	1.55	0.68	.497	0.00
# Distractions	7.45	2.41	3.09	.002	-0.00
Attainment Value	6.14	2.02	3.04	.002	0.00
Utility Value	5.66	2.10	2.69	.007	0.00
Intrinsic Value	0.93	2.38	0.39	.696	0.00
Want-to vs. Have-to	0.31	0.04	7.00	.000	0.00
Want-to vs. Control	0.34	0.05	7.60	.000	-0.00
Age	19.60	0.11	173.91	.000	0.00
Gender	0.73	0.04	17.17	.000	0.01
Parental Education	4.85	0.14	34.63	.000	-0.00
High School Test Score	-0.00	0.09	-0.00	1.000	-0.00
Fit Indices					
χ^2	9.97(df=	=8)			
RMSEA	0.05				

Note. B = unstandardized beta weight. SE(B) = standard error of unstandardized beta weight. z = z-score. p = p-value. *beta* = standardized beta weight. χ^2 = model chi-square. *RMSEA* = root mean squared error of approximation. *CFI* = comparative fit index.

	В	SE(B)	Z.	р	beta
<u># Correct</u>					
Want-to vs. Have-to	0.11	0.84	0.13	.897	0.01
Want-to vs. Control	0.01	0.82	0.01	.992	0.00
Attainment Value	0.24	0.44	0.54	.592	0.08
Intrinsic Value	0.42	0.23	1.86	.063	0.17
Utility Value	0.12	0.38	0.31	.758	0.04
Age	1.16	0.29	4.05	.000	0.35
Gender	- 0.69	0.78	-0.89	.375	-0.08
Parental Education	0.17	0.24	0.71	.480	0.06
High School Test Score	- 0.35	0.36	-0.97	.330	-0.09
Time Spent					
Want-to vs. Have-to	0.14	0.22	0.64	.523	0.07
Want-to vs. Control	0.02	0.22	0.07	.944	0.01
Attainment Value	0.02	0.12	0.16	.875	0.02
Intrinsic Value	0.03	0.06	0.44	.657	0.04
Utility Value	0.07	0.10	0.69	.488	0.11

Structural equation model between experimental condition, perceived value for MCAT quiz, and MCAT quiz outcomes.

	В	SE(B)	Ζ.	р	beta
Age	0.13	0.08	1.70	.090	0.15
Gender	0.19	0.21	0.93	.352	0.09
Parental Education	- 0.20	0.06	-3.20	.001	-0.30
High School Test Score	- 0.02	0.10	-0.26	.796	-0.02
<u>Attainment</u> Value					
Want-to vs. Have-to	0.43	0.31	1.39	.163	0.15
Want-to vs. Control	- 0.15	0.30	-0.52	.604	-0.06
Age	0.13	0.10	1.24	.215	0.12
Gender	0.01	0.28	0.03	.979	0.00
Parental Education	0.02	0.09	0.25	.804	0.02
High School Test Score	0.07	0.13	0.53	.599	0.05
Utility Value					
Want-to vs. Have-to	0.53	0.34	1.56	.119	0.17
Want-to vs. Control	- 0.24	0.33	-0.73	.462	-0.08
Age	0.11	0.12	0.98	.329	0.09
Gender	- 0.25	0.32	-0.77	.439	-0.07
	b	SE(b)	Z.	p	beta

	В	SE(B)	Z.	р	beta
Parental Education	0.06	0.10	0.63	.531	0.06
High School Test Score	0.11	0.15	0.72	.471	0.07
Intrinsic Value					
Want-to vs. Have-to	0.05	0.37	0.14	.888	0.02
Want-to vs. Control	0.52	0.36	1.46	.143	0.16
Age	0.17	0.12	1.35	.178	0.13
Gender	- 0.11	0.34	-0.34	.737	-0.03
Parental Education	- 0.06	0.10	-0.53	.596	-0.05
High School Test Score	0.05	0.16	0.30	.761	0.03
Fit Indices					
χ^2		10.40(df=8)			
RMSEA		0.05			
CFI		0.99			

Note. B = unstandardized beta weight. SE(B) = standard error of unstandardized beta weight. z = z-score. p = p-value. *beta* = standardized beta weight. χ^2 = model chi-square. *RMSEA* = root mean squared error of approximation. *CFI* = comparative fit index.



Appendix A3 – 4. Outcomes as a function of experimental condition by parental education

Note. Overall interaction term: B = -0.52, 95% *CI* [-0.91, -0.14], SE[B] = 0.19, $\beta = -0.37$, p = 0.008. Simple effects found that participants in the want-to condition whose parents did not graduate from college clicked on more temptations compared to those in the have-to condition whose parents did not graduate college (B = 0.63, SE[B] = 0.23, p = 0.01). There was no difference for participants whose parents graduated college (B = -0.24, SE[B] = 0.23, p = 0.29).



Note. Overall interaction term: B = -0.59, 95% *CI* [-0.42, -0.13], SE[B] = 0.23, $\beta = -0.36$, p = 0.01. Simple effects found that participants in the want-to condition whose parents did not graduate college scored better than participants in the have-to condition (B = 0.61, SE[B] = 0.27, p = 0.03) whose parents did not graduate college. There was no difference for participants whose parents graduated college (B = -0.38, SE[B] = 0.27, p = 0.17).

Appendix A3 - 5. Full regression results for outcomes as a function of experimental condition by parental education

	Attainment Value for Study Session			In for	trinsic V Study Se	alue	Utility Value for Study Session			
	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	
(Intercept)	5.41	0.18	< 0.001	4.34	0.23	< 0.001	5.44	0.19	< 0.001	
Want-to vs. Have-to	-0.24	0.18	0.189	-0.02	0.23	0.930	-0.25	0.19	0.195	
Parental Education	0.24	0.18	0.184	-0.39	0.23	0.092	0.40	0.19	0.043	
Want-to vs. Have-to x Parental Education	0.22	0.18	0.220	0.14	0.23	0.540	0.15	0.19	0.441	
Observations	73				73				73	
R ² / adjusted R ²	0.049	/ 0.007			0.0	48 / 0.007	0.072 / 0.032			

Perceived value for study session as a function of experimental condition by parental education.

	Time Spent on Study Session			Temp Durin	otations g Study	Clicked Session	# Correct during Study Session			
	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	
(Intercept)	304.57	17.90	< 0.001	0.77	0.19	< 0.001	6.86	0.23	< 0.001	
Want-to vs. Have-to	-27.49	17.90	0.129	0.49	0.19	0.013	0.45	0.23	0.056	
Parental Education	-10.66	17.90	0.553	-0.36	0.19	0.065	0.04	0.23	0.867	
Want-to vs. Have-to x Parental Education	15.20	17.90	0.399	-0.52	0.19	0.008	-0.59	0.23	0.012	
Observations	73			73			73			
R^2 / adjusted R^2	0.042 / -0.000			0.142	/ 0.105		0.094 / 0.055			

Behavioral outcomes for study session as a function of experimental condition by parental education.

	Attainment Value for MCAT Quiz			In for	trinsic V MCAT	alue Quiz	Utility Value for MCAT Quiz			
	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	
(Intercept)	4.93	0.18	< 0.001	4.41	0.23	< 0.001	4.99	0.19	< 0.001	
Want-to vs. Have-to	-0.47	0.18	0.011	-0.13	0.23	0.575	-0.47	0.19	0.014	
Parental Education	0.19	0.18	0.293	-0.24	0.23	0.320	0.25	0.19	0.188	
Want-to vs. Have-to x Parental Education	0.42	0.18	0.023	0.22	0.23	0.341	0.34	0.19	0.077	
Observations	73			73			73			
R^2 / adjusted R^2	0.109	/ 0.071		0.029	/ -0.013		0.099 / 0	0.059		

Perceived value for MCAT quiz as a function of experimental condition by parental education.

	T on 1	Time Spe MCAT (nt Quiz	# Correct during MCAT Quiz			
	В	SE(B)	р	В	SE(B)	р	
(Intercept)	543.51	26.09	< 0.001	13.35	0.56	< 0.001	
Want-to vs. Have-to	-15.08	26.09	0.565	0.15	0.56	0.788	
Parental Education	-51.14	26.09	0.054	0.79	0.56	0.165	
Want-to vs. Have-to x Parental Education	-5.34	26.09	0.838	-0.29	0.56	0.606	
Observations	73			73			
\mathbb{R}^2 / adjusted \mathbb{R}^2	0.067/0	0.026		0.033 / -0.009			

Behavioral outcomes for MCAT quiz as a function of experimental conditions by parental education.

	Obstacles				Effort		Progress		
	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р
(Intercept)	5.47	0.24	< 0.001	5.56	0.20	< 0.001	5.28	0.17	< 0.001
Want-to vs. Have-to	-0.47	0.24	0.050	-0.13	0.20	0.503	-0.15	0.17	0.393
Parental Education	-0.03	0.24	0.899	-0.06	0.20	0.766	0.08	0.17	0.655
Want-to vs. Have-to x Parental Education	0.03	0.24	0.899	-0.09	0.20	0.666	0.26	0.17	0.134
Observations	73			73			73		
R^2 / adjusted R^2	0.075	/ 0.034		0.022	/ -0.020		0.034	/ -0.008	

Self-reported outcomes as a function of experimental conditions by parental education.

Appendix A3 - 6. Full regression results for outcomes as a function of treatment fidelity

	Attainn for Stud	nent Value ly Session		Intrin for Stu	sic Value dy Sessio	t	Utility Value for Study Session			
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	
(Intercept)	4.98	0.63	< 0.001	5.27	0.80	< 0.001	4.60	0.68	< 0.001	
Both Want-to and Have-to	-0.15	0.32	0.652	0.06	0.41	0.893	0.20	0.35	0.566	
Have-to Only	0.06	0.46	0.901	-0.14	0.59	0.808	0.26	0.50	0.605	
High School Test Score	0.29	0.16	0.067	-0.17	0.20	0.397	0.20	0.17	0.235	
Female	-0.09	0.33	0.783	0.37	0.42	0.377	-0.35	0.36	0.325	
Parental Education	0.14	0.12	0.226	-0.27	0.15	0.071	0.24	0.13	0.058	
Observations	72		72				72			
R^2 / adjusted R^2	0.060 / -	0.011	0.054 / -0.017 0.06					068 / -0.0	03	

Perceived values for study session as a function of treatment fidelity and covariates

	T on S	ime Spe Study Ses	nt ssion	Tem durii	ptations ng Study	Clicked Session	duri	# Correct during Study Session			
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р		
(Intercept)	413.24	61.58	< 0.001	1.44	0.64	0.028	6.28	0.81	< 0.001		
Both Want-to and Have-to	-45.99	31.73	0.152	0.43	0.33	0.192	- 0.10	0.42	0.815		
Have-to Only	3.66	44.98	0.935	-0.44	0.47	0.353	0.32	0.59	0.596		
High School Test Score	15.97	15.41	0.304	-0.16	0.16	0.317	- 0.47	0.20	0.025		
Female	-32.00	32.16	0.323	0.56	0.33	0.100	0.63	0.42	0.140		
Parental Education	-15.39	11.48	0.185	-0.29	0.12	0.017	0.04	0.15	0.815		
Observations	72			72			72				
R^2 / adjusted R^2	0.107/0).039		0.135	/ 0.070		0.106 /	0.039			

Behavioral outcomes for study session as a function of treatment fidelity and covariates.

	Atta for	ainment MCAT	Value Quiz	Iı fo	ntrinsic V r MCAT	/alue Quiz	Utility Value for MCAT Quiz			
Predictors	В	SE(B)	р	В	SE(B)	р	b	SE(B)	р	
(Intercept)	4.74	0.64	< 0.001	4.94	0.82	< 0.001	4.92	0.66	< 0.001	
Both Want-to and Have-to	0.57	0.33	0.089	0.36	0.42	0.401	0.33	0.34	0.328	
Have-to Only	0.52	0.46	0.263	-0.07	0.60	0.912	0.78	0.48	0.111	
High School Test Score	0.06	0.16	0.730	-0.06	0.20	0.786	0.10	0.17	0.537	
Female	0.26	0.33	0.441	0.42	0.43	0.334	0.15	0.34	0.657	
Parental Education	-0.02	0.12	0.869	-0.21	0.15	0.183	0.03	0.12	0.807	
Observations	72				72				72	
\mathbf{R}^2 / adjusted \mathbf{R}^2	0.062	/ -0.010			0.046	/ -0.027			0.045 / -0.027	

Perceived value for MCAT quiz as a function of treatment fidelity and covariates.

	Т	Time Spent of MCAT Quiz	on z		# Correct during MCAT Quiz				
Predictors	В	SE(B)	p	В	SE(B)	р			
(Intercept)	673.31	92.40	< 0.001	12.16	1.98	< 0.001			
Both Want-to and Have-to	20.15	47.61	0.674	0.39	1.02	0.702			
Have-to Only	4.18	67.49	0.951	-0.27	1.45	0.853			
High School Test Score	9.54	23.13	0.681	-0.67	0.50	0.182			
Female	5.71	48.26	0.906	-0.45	1.03	0.663			
Parental Education	-34.85	17.23	0.047	0.36	0.37	0.333			
Observations	72			72					
R ² / adjusted R ²	0.076/0.00	6		0.065 /	-0.006				

Behavioral outcomes for MCAT quiz as a function of treatment fidelity and covariates.

		Obstacl	acles Effort			Progress			
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р
(Intercept)	4.89	0.85	< 0.001	5.58	0.70	< 0.001	5.14	0.62	< 0.001
Both Want-to and Have-to	0.22	0.44	0.613	0.34	0.36	0.354	-0.31	0.32	0.344
Have-to Only	0.74	0.62	0.233	0.22	0.51	0.667	-0.01	0.45	0.980
High School Test Score	0.39	0.21	0.071	0.10	0.18	0.554	0.08	0.16	0.608
Female	-0.08	0.44	0.859	0.21	0.37	0.565	-0.07	0.33	0.823
Parental Education	0.08	0.16	0.613	-0.08	0.13	0.565	0.07	0.12	0.530
Observations	72			72			72		
R^2 / adjusted R^2	0.064	/ -0.007		0.032	/ -0.041		0.022	/ -0.052	

Self-reported outcomes as a function of treatment fidelity and covariates.

	Ove	erall	Hav	e-to	Want-to		
	М	SD	М	SD	М	SD	
Word Count	62.8	57.0	95.5	42.3	95.4	43.3	
Authentic	40.5	36.4	56.2	28.0	67.8	24.0	
Tone	50.9	43.2	85.9	21.5	67.8	31.3	
Affect	4.2	4.4	7.8	4.3	4.9	2.7	
Personal Pronouns	8.0	6.2	11.7	2.8	12.5	2.8	
Positive Emotions	3.7	4.1	6.9	4.2	4.1	2.7	
Negative Emotions	0.5	0.9	0.8	1.1	0.8	0.9	
Work	4.3	3.9	6.4	2.8	6.8	2.9	
Money	0.3	0.7	0.3	0.7	0.6	0.9	
Family	0.4	1.0	0.5	0.9	0.8	1.5	
Friend	0.0	0.2	0.1	0.3	0.0	0.1	
Risk	0.2	0.5	0.3	0.7	0.2	0.5	
Reward	1.2	1.6	2.2	1.7	1.4	1.6	
Past Focused	1.3	1.9	1.9	2.3	2.0	1.7	
Present Focused	9.5	7.7	13.0	4.1	16.0	4.0	
Future Focused	0.5	1.0	0.7	0.9	0.8	1.3	

Appendix A3 – 7. Summary statistics of LIWC codes overall and by want-to versus have-to condition

Note. M = mean. SD = standard deviation.

Appendix A3 - 8. Full regression results for LIWC coding as a function of want-to versus have to condition

		Word C	Count	Authentic				Tone				Affect		
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р		
(Intercept)	95.4 9	6.85	<0.00 1	56.2 3	4.2 0	<0.00 1	85.8 8	4.2 4	<0.00 1	4.9 0	0.6 2	<0.00 1		
Want-to	-0.05	10.0 3	0.996	11.5 9	6.1 5	0.064	- 18.1 1	6.2 2	0.005	2.8 6	0.8 5	0.001		
Observation s	73			73	3		73	3		7	3			
R^2 / adjusted R^2	0.000	/ -0.014		0.	048 / 0.0)34	0.	107 / 0.0	94	0	.139 / 0.	127		

Word count, authentic, and tone as a function of want-to versus have-to conditions.

	Pers	onal Pro	onouns		Positiv	e Emotion		Negative Emotion		
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	
(Intercept)	11.74	0.45	< 0.001	6.93	0.58	< 0.001	0.79	0.16	< 0.001	
Want-to	0.79	0.66	0.235	-2.84	0.84	0.001	-0.00	0.23	0.993	
Observations	73			73				73		
R^2 / adjusted R^2	0.020 / 0.006 0.138 / 0.126 0.000 / -					0.000 / -0.0	14			

Personal pronouns, positive emotions, and negative emotions as a function of want-to versus have-to conditions.

Work, money, family, friend as a function of want-to versus have-to conditions.

	Work				Money	ey Family		7	Friend			
Predictors	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р	В	SE(B)	р
(Intercept)	6.36	0.46	< 0.001	0.26	0.13	0.052	0.54	0.19	0.007	0.10	0.04	0.010
Want-to	0.43	0.68	0.526	0.34	0.19	0.082	0.30	0.29	0.301	-0.09	0.06	0.135
Observations	73			73			73			73		
R^2 / adjusted R^2	0.006	5/-0.008	8	0.042	2 / 0.029		0.015	5 / 0.001		0.031	/ 0.018	

Reward and risk as a function of war	nt-to versus have-to conditions.
--------------------------------------	----------------------------------

	Risk		Reward				
В	SE(B)	р	В	SE(B)	р		
0.35	0.09	< 0.001	2.22	0.26	< 0.001		
-0.19	0.14	0.172	-0.80	0.38	0.040		
73		73					
0.026	/ 0.012	0.0	58 / 0.0	45			
	<i>B</i> 0.35 -0.19 73 0.026	Risk B SE(B) 0.35 0.09 -0.19 0.14 73 0.026 / 0.012	Risk B SE(B) p 0.35 0.09 <0.001	Risk R B SE(B) p B 0.35 0.09 <0.001	RiskRewardB $SE(B)$ p B $SE(B)$ 0.350.09<0.001		

	Past focused			Pre	Present focused			Future Focused		
Predictors	В	SE(B)	р	В	SE(B)	р	b	SE(B)	р	
(Intercept)	1.93	0.33	< 0.001	12.98	0.65	< 0.001	0.65	0.18	< 0.001	
Want-to	0.08	0.49	0.862	3.03	0.95	0.002	0.18	0.26	0.491	
Observations	73			73			73			
R^2 / adjusted R^2	0.000 / -0.014			0.125 / 0.113			0.007 / -0.007			

Past focused, present focused, and future focused as a function of want-to versus have-to conditions.

Appendix A3 – 9. Full structural equation modeling results for LIWC analyses

	В	SE(B)	Z.	р
<u># Correct</u>				
Want-to Condition	0.12	0.42	0.28	.778
Affect	0.11	0.06	1.98	.048
Reward	-0.23	0.13	-1.80	.072
Present Focused	0.01	0.05	0.13	.896
Time Spent				
Have-to Condition	-0.15	0.12	-1.22	.223
Affect	0.01	0.02	0.31	.757
Reward	-0.04	0.04	-1.07	.287
Present Focused	-0.01	0.01	-0.38	.706
# Distractions				
Want-to Condition	0.40	0.37	1.07	.284
Affect	0.00	0.05	0.07	.945
Reward	-0.05	0.11	-0.44	.659
Present Focused	0.01	0.04	0.24	.809
Affect				
Want-to Condition	2.86	0.83	3.43	.001
Reward				
Want-to Condition	0.80	0.38	2.12	.034

Structural equation model between want-to versus have-to conditions, LIWC coding (affect, positive emotion, reward, and present focused), and study session outcomes.

	В	SE(B)	Ζ.	p
Present Focused				
Want-to Condition	-3.03	0.94	-3.24	.001
	In	direct Ef	fects	
Indirect effect of affect on # correct	0.33	0.19	1.71	.086
Indirect effect of affect on time spent	0.01	0.05	0.31	.758
Indirect effect of affect on distractions	0.01	0.15	0.07	.945
Indirect effect of reward on # correct	-0.18	0.13	-1.37	.171
Indirect effect of reward on time spent	-0.03	0.03	-0.95	.341
Indirect effect of reward on distractions	-0.04	0.09	-0.43	.666
Indirect effect of present focused on # correct	-0.02	0.14	-0.13	.896
Indirect effect of present focused on time spent	0.02	0.04	0.37	.708
Indirect effect of present focused on distractions	-0.03	0.13	-0.24	.809
		Fit Indic	<u>es</u>	
χ^2	0.00(df=0)			
RMSEA	0.00			
CFI	1.00			

Note. b = unstandardized beta weight. SE(b) = standard error of unstandardized beta weight. z = z-score. p = p-value. $\chi^2 =$ model chi-square. *RMSEA* = root mean squared error of approximation. *CFI* = comparative fit index.

	В	SE(B)	Z.	р
<u># Correct</u>				
Want-to Condition	-0.62	1.01	-0.61	.539
Affect	0.29	0.14	2.13	.033
Reward	-0.14	0.30	-0.44	.657
Present Focused	-0.00	0.11	-0.01	.995
Time Spent				
Want-to Condition	-0.29	0.24	-1.20	.231
Affect	0.05	0.03	1.37	.172
Reward	-0.04	0.07	-0.53	.598
Present Focused	0.01	0.03	0.42	.673
Affect				
Want-to Condition	2.86	0.83	3.43	.001
Reward				
Want-to Condition	0.80	0.38	2.12	.034
Present Focused				
Want-to Condition	-3.03	0.94	-3.24	.001
		Indirect	Effects	
Indirect effect of affect on # correct	0.84	0.46	1.81	.070
Indirect effect of affect on time spent	0.13	0.10	1.27	.204

Structural equation model between want-to versus have-to conditions, LIWC codes (affect, positive emotions, reward, and present focused), and MCAT quiz outcomes.

	В	SE(B)	z	р
Indirect effect of reward on # correct	-0.11	0.25	-0.44	.663
Indirect effect of reward on time spent	-0.03	0.06	-0.51	.609
Indirect effect of present focused on # correct	0.00	0.34	0.01	.995
Indirect effect of present focused on time spent	-0.03	0.08	-0.42	.675
		<u>Fit</u>	Indices	
χ^2	0.00(df=0)			
RMSEA	0.00			
CFI	1.00			

Note. b = unstandardized beta weight. SE(b) = standard error of unstandardized beta weight. z = z-score. p = p-value. $\chi^2 =$ model chi-square. *RMSEA* = root mean squared error of approximation. *CFI* = comparative fit index.

	В	SE(B)	Z.	р
<u>Obstacles</u>				
Want-to Condition	-0.86	0.41	-2.08	.037
Affect	-0.11	0.06	-1.97	.049
Reward	0.12	0.12	0.97	.332
Present Focused	-0.06	0.05	-1.21	.225
<u>Effort</u>				
Want-to Condition	-0.40	0.36	-1.13	.257
Affect	-0.03	0.05	-0.63	.530
Reward	0.01	0.11	0.10	.918
Present Focused	-0.04	0.04	-0.91	.360
Progress				
Want-to Condition	-0.07	0.32	-0.21	.831
Affect	-0.01	0.04	-0.26	.799
Reward	-0.04	0.10	-0.37	.709
Present Focused	-0.04	0.04	-1.27	.204
Affect				
Want-to Condition	2.86	0.83	3.43	.001
Reward				
Want-to Condition	0.80	0.38	2.12	.034
Present Focused				
Want-to Condition	-3.03	0.94	-3.24	.001

Structural equation model between want-to versus have-to conditions, LIWC codes (affect, positive emotions, reward, and present focused), and self-reported outcomes.
B	SE(B)		Z	р
	Indirect Effects			
Indirect effect of affect on # obstacles	-0.32	0.19	-1.71	.087
Indirect effect of affect on effort	-0.09	0.14	-0.62	.537
Indirect effect of affect on progress	-0.03	0.12	-0.25	.799
Indirect effect of reward on obstacles	0.10	0.11	0.88	.378
Indirect effect of reward on effort	0.01	0.09	0.10	.918
Indirect effect of reward on progress	-0.03	0.08	-0.37	.713
Indirect effect of future focused on obstacles	0.17	0.15	1.14	.256
Indirect effect of future focused on effort	0.11	0.13	0.88	.379
Indirect effect of future focused on progress	0.14	0.11	1.18	.237
	Ī	Fit Indic	<u>ces</u>	
χ^2	0.00(df=0)			
RMSEA	0.00			
CFI	1.00			

Note. b = unstandardized beta weight. SE(b) = standard error of unstandardized beta weight. z = z-score. p = p-value. $\chi^2 =$ model chi-square. *RMSEA* = root mean squared error of approximation. *CFI* = comparative fit index.