The role of autonomous and controlled motivation across a goal's lifecycle.

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Abstract

Autonomous motivation involves doing something because one genuinely wants to – the activity is inherently fun, meaningful or important. Controlled motivation involves doing something because one feels compelled to do so – either by external contingencies or because of one's own pressuring feelings of obligation and shame. The roles of these two forms of motivation in goal striving have been an integral focus of Self-Determination theory (SDT), with decades of research inextricably linking autonomous motivation for goal pursuit with positive goal outcomes and adaptation (Koestner, Otis, Powers, Pelletier & Gagnon, 2008).

In a series of eight longitudinal studies, the present thesis sought to further our understanding of these forms of motivation by bridging SDT goal motivation research with two other theoretical frameworks that focus on distinct later phases in the goal's lifecycle such as (1) the action crisis which is characterized by goal stagnation and conflict (Brandstätter, Hermann & Schüler, 2013), and (2) goal disengagement which is characterized by relinquishing psychological commitment and behavioural effort towards a blocked goal (Goal Adjustment Theory; Wrosch, Scheier, Carver & Schultz, 2003).

Our examination of the role of both forms of motivation during goal engagement demonstrates that autonomous motivation for goal pursuit shields individuals from experiencing action crises and makes individuals less likely to relinquish personal goals during active goal pursuit (Articles 1 and 5). Conversely, controlled motivation for goal pursuit is associated with more severe action crises and is indirectly associated with increases in psychological distress, poorer physical health, and chronic stress (Articles 1, 2, 3).

Shifting focus from goal engagement to goal disengagement, this thesis also explored the novel question of whether motivation plays a role in the successful relinquishing of blocked goals (Articles 4 & 5). Goal adjustment research consistently shows that when people hit roadblocks in the pursuit of their personal goals, disengagement is an adaptive response associated with improved mental and physical health (Wrosch, Scheier & Miller, 2013). However, beyond individual differences in the capacity to disengage, little is known about the factors that facilitate or hinder goal disengagement. Indeed, many people experience difficulty letting go of a valued goal, even when goal pursuit has been problematic.

To address this gap in the literature, we tested a motivational model of goal disengagement. Our results demonstrate that a) holding autonomous motives for goal disengagement (i.e., having a sense of truly identifying with the decision to let go) helped emerging adults, community adults, and professional athletes relinquish blocked goals (Articles 4 & 5). Moreover, we found that b) autonomous motivation for goal disengagement prevented individuals from getting stuck in an "inaction crisis" (i.e., feeling torn between disengaging further and re-adopting the lost goal) which facilitated goal disengagement (Article 5). Conversely, we found that c) controlled motives for disengagement (i.e., feeling forced or pressured to relinquish a goal) resulted in greater "inaction crisis" and compromised disengagement progress (Article 5).

Together, the articles of this thesis highlight the optimizing force of autonomous motivation at different stages of the goal's lifecycle: protecting goals from conflict and abandonment during goal engagement, and facilitating the release of blocked goals during goal disengagement. Likewise, this thesis points to the pernicious nature of controlled motivation throughout the goal's lifecycle: promoting goal-related conflict and basic psychological needs

sacrifice during goal engagement and hindering the release of blocked goals during disengagement.

Résumé

La motivation autonome représente la volonté de faire quelque chose parce qu'on le veut réellement - car l'activité en question est intrinsèquement amusante, significative ou importante pour soi. La motivation contrôlée consiste à faire quelque chose par obligation, soit par des contingences externes, par sentiment de devoir ou de culpabilité. Le rôle de ces deux formes de motivation dans la poursuite d'objectifs est au centre de la théorie de l'autodétermination (TAD). Des décennies de recherche ont établi que la poursuite d'objectifs sous-tendue par une motivation autonome est associée à une panoplie de conséquences positives et de processus adaptatifs liés à ces objectifs (Koestner, Otis, Powers, Pelletier & Gagnon, 2008).

Dans une série de huit études longitudinales, la présente thèse a cherché à approfondir notre compréhension de ces deux formes de motivation en établissant un lien entre la recherche sur la motivation et la poursuite d'objectifs dans la perspective de la TAD et deux autres cadres théoriques qui se concentrent sur des phases ultérieures distinctes du cycle de vie d'un but, soient: (1) la crise d'action qui se caractérise par la stagnation d'un but personnel et au conflit quant à la poursuite de l'engagement de ce but (Brandstätter, Hermann & Schüler, 2013) et (2) le désengagement de la poursuite d'un objectif (Wrosch, Scheier, Carver & Schultz, 2003).

Notre examen du rôle de ces deux formes de motivation au cours de la poursuite d'objectifs montre que la motivation autonome pour la poursuite d'objectifs protège les individus contre les crises d'action et les rend moins susceptibles de renoncer à leurs objectifs personnels pendant la poursuite active d'objectifs (Articles 1 et 5). En outre, la motivation contrôlée pour la poursuite d'un but est associée à des crises d'action plus graves et est indirectement associés à une augmentation de la détresse psychologique, à une santé physique affaiblie et à un stress chronique accru (Articles 1, 2, 3).

Passant de l'engagement dans la poursuite d’un but au désengagement de la poursuite de ce but, cette thèse explore également les effets de la motivation sur l'abandon des objectifs (Articles 4 et 5). Les recherches sur l'ajustement des objectifs montrent systématiquement que le désengagement d’un but suite à la rencontre d’obstacles dans sa poursuite représente une réponse adaptative qui est associée à une amélioration de la santé mentale et physique (Wrosch, Scheier & Miller, 2013). Cependant, au-delà des différences individuelles dans la capacité à se désengager, la recherche s’est peu intéressée aux facteurs qui entravent ou facilitent le désengagement de la poursuite d’un objectif. En effet, de nombreuses personnes éprouvent des difficultés à se désengager d'un objectif, même lorsque la poursuite de l'objectif a été problématique.

Pour combler cette lacune dans la littérature, nous avons tenté de formuler un modèle du désengagement des objectifs. Ce modèle nous a permis de démontrer que : (1) disposer de motifs autonomes pour le désengagement des objectifs (c'est-à-dire le fait d'avoir le sentiment de s'identifier véritablement à la décision de lâcher prise) aide les jeunes adultes, les adultes de la communauté et les athlètes professionnels à renoncer aux objectifs ‘bloqués’ ou hors d’atteinte. (Articles 4 et 5). De plus, nous avons constaté que (2) la motivation autonome pour le désengagement des objectifs empêche les individus de se retrouver coincés dans une "crise d'inaction" (c'est-à-dire se sentir déchirés entre le désengagement et la réadoption de l'objectif hors d’atteinte), ce qui facilite le désengagement des objectifs (Article 5). Inversement, nous avons constaté que (3) la motivation contrôlée face au désengagement (c'est-à-dire le sentiment d'être forcé ou contraint à renoncer à un objectif) entraine une plus grande "crise d'inaction" et compromet la progression du désengagement (Article 5).

Dans l’ensemble, les articles de cette thèse mettent en évidence les effets bénéfiques de la motivation autonome à différents stades du cycle de vie de la poursuite d’un objectif. La motivation autonome protège des conflits liés à leur poursuite des objectifs et de l’abandon de leur poursuite. De plus, la motivation autonome facilite la renonciation des objectifs bloqués ou inatteignables pendant le désengagement de l'objectif. De plus, cette thèse met en évidence la nature pernicieuse de la motivation contrôlée qui favorise les conflits liés aux objectifs et le sacrifice des besoins psychologiques de base pendant l'engagement des objectifs, en plus d’entraver le désengagement des objectifs bloqués ou inatteignables.

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I am deeply grateful for the incredible experience of working towards my PhD at McGill University in the Psychology Department. Having studied the three essential "nutrients" that fuel intrinsic motivation, I am thankful to all the people who unconditionally supported me on this journey and helped me to feel autonomous, competent and connected every step of the way. The work going in to this thesis would not have been possible without the generosity, support, humor, inspiration and positivity of my supervisor, family, partner, friends, mentors, teachers and colleagues.

My first thank you is for Richard Koestner, whose genuine kindness, boundless generosity, contagious excitement, and big-picture research vision make him the best role-model and mentor that I could have asked for. Richard is the paradigm of an autonomy supportive supervisor, granting his students the freedom to pursue the questions that genuinely interest them and creating an environment that promotes team-work and collaboration. I am so grateful that Richard took a chance on me, eight years ago, when I approached him with an idea for studying "dream school" disengagement. How do people let go of a valued goal and let that ship sail? After dedicating my doctoral research to this question, it feels satisfying to know that autonomous motivation can set people free. What started as an undergraduate honors project turned into a program of doctoral research that included studies on Olympic athletes, business executives, as well as the temporary transformation of our lab into a hair salon. Even non-thesis related projects were encouraged – giving rise to investigations on relationship goals, emergent goals, the millennial motto #YOLO, and the use of social media in goal pursuit.

Richard supported my autonomy in every aspect of this academic journey. Deadlines were self-imposed, tasks and meetings were voluntary, and there were no limits on vacation

time. While others might assume an approach like this would backfire, I observed the opposite. Richard, who likes describing his studies using nautical metaphors, made us captains on the research voyage. Every time we sailed the vast oceans of knowledge to chart unknown motivational phenomena, our passage felt self-determined. Importantly, we always had a safe harbor to return to. Richard was available to help with any idea, writing, or analysis, and lend support no matter the cause. Richard also proved an infallible compass, guiding us in the right direction and steering us away from murky waters. At this junction, I do not know the "what" of my future career, but I am certain of the "how". I am inspired to teach, mentor, support, and lead following Richard's example.

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Contribution of Authors

Five manuscripts are included in the present doctoral thesis. The first manuscript "Stuck in Limbo: The antecedents and consequences of action crises in personal goal pursuit" was co-authored by myself, Nora Hope, Brenda Harvey, Ariane Marion-Jetten and Richard Koestner (Article 1). Article 1 was published in the *Journal of Personality*. I was inspired to conduct a literature review on action crises after hearing Veronika Brandstätter present at the Association for Psychological Science conference in New York. This literature review led to the research questions regarding the antecedents and consequences of action crises, which were further developed with the input of Richard Koestner. I collected the goal study data used for this project with assistance from other graduate students and undergraduate research assistants in the lab during the academic year of 2015-2016. Ariane Marion-Jetten used this data to write her undergraduate honors thesis, which I co-supervised with Richard Koestner. I conducted the data analyses and interpreted the data, with input from Nora Hope and Richard Koestner. Nora Hope helped me learn multi-level modelling. We also contacted former lab member Marina Milyavskaya for statistical consultation during the revision process. I wrote and revised the manuscript, and received editorial assistance from all co-authors.

Article 2 "When goal pursuit gets hairy: A longitudinal goal study examining the role of controlled motivation and action crises in predicting changes in hair cortisol, perceived stress, health and depression symptoms" is currently unpublished and was co-authored by myself, Emily Moore, Amanda Moore, Jérémie Verner-Filion, Isabelle Ouellet-Morin and Richard Koestner. I conceptualized the study and research questions with input from Richard Koestner, conducted a literature review on the stress hormone cortisol, and identified hair-cortisol as the ideal biomarker to capture chronic stress. I contacted Isabelle Ouellet-Morin for her expertise

with hair cortisol sampling. I submitted an ethics application to collect hair cortisol. The data for this study was collected by myself, Emily Moore and Amanda Moore under the supervision of Richard Koestner and following the protocol recommended by Isabelle Ouellet-Morin. Emily Moore and Amanda Moore helped me greatly with the sampling of participants' hair for cortisol. Jessica Cohen, our research assistant that year, also helped with the data collection, as did other graduate students and undergraduate honors students. The hair samples were sent to specialized lab for the cortisol extraction. I conducted the data analysis with assistance from Richard Koestner and statistical advice from Isabelle Ouellet-Morin. I wrote the manuscript with input and editorial feedback from Richard Koestner, Jérémie Verner-Filion and Isabelle Ouellet-Morin. Jérémie Verner-Filion made the figure using a special illustration tool.

Article 3 "Sacrifice - but at what price? A longitudinal study of young adults' sacrifice of basic psychological needs in pursuit of career goals" was co-authored by myself, André St. Jacques, Jérémie Verner-Filion, Frank Kachanoff and Richard Koestner and was published in the special issue of *Motivation and Emotion* that focused on Advances in Basic Psychological Needs Theory (BPNT). André St. Jacques developed the idea of need sacrifice in a lab meeting with myself, Frank Kachanoff, and Richard Koestner. I lead the data collection for both studies of Article 3 with help from other graduate and undergraduate students in the lab under Richard Koestner's supervision. André St. Jacques wrote an earlier version of Study 1 for his master's thesis, with guidance from Richard Koestner. Richard Koestner revised the manuscript following the initial revise and resubmit with editorial help from the co-authors. Working full-time in Japan, André St. Jacques was no longer a lab member at the time of the first revision, and agreed to let another co-author take the lead on this manuscript. Richard Koestner invited me to take the lead on the need sacrifice project. Following the reviewers' comments and concerns, I re-

analyzed the data following the second invitation to revise and resubmit the manuscript and changed the analyses from what André St. Jacques submitted for his master's thesis. With the help of Richard Koestner I re-wrote sections of the manuscript and added a second study that confirmed the new findings for Study 1. I then revised this manuscript two additional times (four revisions total), with editorial help from Jérémie Verner-Filion, Frank Kachanoff and Richard Koestner. Jérémie Verner-Filion conducted the structural equation models that emerged in later revisions and made the figures using a special illustration tool.

Article 4 "Letting go of gold: Examining the role of autonomy in elite athletes' disengagement from their athletic careers and well-being in retirement" was co-authored by myself, Jo-Annie Fortin, Joelle Carpentier, Nora Hope and Richard Koestner and was published in the *Journal of Clinical Sport Psychology.* I conducted the literature review, which led to the research questions of the study. Jo-Annie Fortin, a former Canadian Olympian, was an honors student at the time of the first wave of data collection and was pivotal in the recruitment process by connecting us with the transition team at Sport Canada. I designed the study with input from Richard Koestner. Jo-Annie Fortin helped with the translation of the French surveys for the first survey, Joëlle Carpentier helped with the translation for the second survey. I lead the data collection with help from Jo-Annie Fortin and another undergraduate student. I conducted the analyses, wrote the manuscript and undertook the revision process with input from Richard Koestner and Joëlle Carpentier. Nora Hope helped on this project with editorial feedback.

Article 5 "Choosing to lose it: the role of autonomous motivation in goal disengagement" was co-authored by myself, Frank Kachanoff, Amanda Moore and Richard Koestner. The manuscript is currently under review at the *Journal of Personality and Social Psychology: Individual Differences*. I conducted the literature review, which led to the research questions of

the three studies of Article 5. I designed and conceptualized the study design with input from Richard Koestner, leading the data collection for Studies 1 and 3 with help from other graduate and undergraduate students in the lab under Richard Koestner's supervision. Amanda Moore led the data collection for the Mturk Community Study (Study 2). The data were analyzed and interpreted by myself, Frank Kachanoff and Richard Koester. Frank Kachanoff wrote the R script for the logistic binary regression analyses that appear in Study 3. I wrote the manuscript with editorial help from all co-authors.

Statement of Original Contribution

Unique Analytical and Theoretical Contributions

Autonomous motives for personal goals have been repeatedly associated with positive goal-related outcomes such as greater effort, progress and goal attainment (Holding, Hope, Harvey, Marion Jetten, & Koestner, 2017; Koestner, Otis, Powers, Pelletier, & Gagnon, 2008; Sheldon & Elliot, 1998). Meanwhile, controlled motives for goal pursuit appear to play a negligible role for goal-related outcomes (e.g., Koestner et al., 2008). Thus, while most research Self Determination Theory (SDT) goal research has focused on predicting positive goal outcomes, little is known about the costs of controlled goal striving, or how both forms of motivation are associated with phases in goal striving that are characterized by setbacks and difficulties, such as the action crisis (Brandstätter et al., 2013). Furthermore, to date, no longitudinal studies have investigated how goal motivation relates to goal disengagement. Indeed, most of the literature on goal disengagement has identified numerous benefits of relinquishing unattainable or futile goals (Wrosch et al., 2013) and has primarily considered variability in disengagement as a function of individual differences rather than goal-specific motivation.

The present thesis addresses these gaps in the goal literature in a series of eight longitudinal investigations conducted in diverse samples including college students, community adults, and professional athletes. Each of the five articles makes unique contributions to analytical and theoretical understandings of the relationship between autonomous and controlled motivation, different phases of the goal cycle, and well-being outcomes. This thesis makes important theoretical contributions to SDT by considering the maladaptive consequences of

controlled goal striving for mental health, stress, and physical health (Articles 1-3). Furthermore, the studies in this thesis aim to bridge the motivation research of SDT with the Lifespan Model of Human Development (Heckhausen, Schulz & Wrosch; 2010; 2019), Goal Adjustment Theory (Wrosch et al., 2003) and the Rubicon Model (Heckhausen & Gollwitzer, 1987) (Articles 1, 4, 5).

The most important contribution of Article 1 is testing the novel hypotheses that autonomous motivation for goal pursuit would lead to less severe action crises, while controlled motivation for goal pursuit would lead to more severe action crises. Few studies have examined the antecedents of action crises, although action orientation has been identified as an individual difference associated with an increased likelihood of experiencing action crises in goal pursuit (Brandstätter et al., 2013; Hermann & Brandstätter, 2013). Hermann and Brandstätter (2013, study 3) considered the role of motivation in action crises previously, finding that goal self-concordance partially mediated the relationship between trait level action orientation and action crises, such that individuals high in action orientation displayed increased self-concordant goal setting. However, autonomous and controlled goal motivation had not been considered as separate predictors of action crises. To deepen our understanding of the role of goal motivation in the development of action crises, we also sought to examine the effects of within-person differences in autonomous motivation. Thus, Article 1 is the first research to examining the role of goal motivation on action crises in a multilevel framework, highlighting a novel analytic contribution. Other notable original contributions of Article 1 include (1) the assessment of other relevant personality traits in predicting action crises, (2) investigating the impact of controlled goal motivation and action crises on changes in symptoms of depression, and (3) testing goal effort as a mechanism through which autonomous motivation may act as a protective factor for

the emergence of action crises.

Article 2 is unique in examining the effects of controlled motivation and action crises on four indicators of stress and ill-being. The most notable contribution of Article 2 is the use of hair-sampling methodology to obtain repeated measures of an endocrinological marker of chronic stress: hair cortisol. To the best of our knowledge, no self-regulation or goal research to date has examined changes in hair cortisol levels as an outcome. This finding has implications for SDT, which historically focused on positive aspects of human functioning. Recently SDT is moving towards studying the conditions that bring about pathological functioning (Vansteenkiste & Ryan, 2013) and considering the neurobiological substrates underpinning SDT's motivational processes (Di Domenico & Ryan, 2017). Article 2 advances SDT in both of these directions by linking controlled motivation for personal goals with pathological functioning (i.e., increased symptoms of depression) and a biological marker of chronic stress. Additionally, Article 2 extends previous action crisis research documenting an association between action crisis severity and salivary cortisol (Brandstätter et al., 2013) but not hair cortisol. This is important because salivary cortisol is thought to capture acute stress whereas hair cortisol is thought to capture chronic stress (Kirschbaum, Tietze, Skoluda & Dettenborn, 2009), thereby linking action crises with increases in chronic stress.

Article 3 offers theoretical contributions to SDT and Basic Psychological Needs Theory (BPNT) by integrating research on career goal pursuit, sacrifices, and need frustration. Article 3 introduces a new form of sacrifice – psychological need sacrifice – into the work-life balance literature, thereby connecting work-life balance research with BPNT. Our results suggest that the sacrifice of psychological needs is distinct from the sacrifice of maintenance and leisure activities. While sacrificing basic psychological needs appeared to be negatively associated with

career goal progress and resulted in increased psychological distress, maintenance and leisure activity sacrifices were unrelated to diminished functioning over the course of the study. In fact, participants who sacrificed their leisure activities actually made *more* progress on their career goal over the school year when controlling for psychological need sacrifice.

Article 4 made unique theoretical contributions to the athletic retirement literature, SDT, and Goal Adjustment Theory. Article 4 set out to (1) to conceptualize the transition into athletic retirement as a form of disengagement, (2) introduce SDT motivation factors as important predictors for successful disengagement from a terminated athletic career, and (3) examine how autonomous motivation for retirement and disengagement progress impacted athletes' well-being in retirement. While numerous studies have investigated the factors that facilitate smooth career transitions in athletes (Park, Lavallee & Tod, 2013), these have not been previously understood through the theoretical lens of SDT, which distinguishes between autonomous and controlled motivation. Similarly, Goal Adjustment theorists have previously examined the benefits of goal disengagement in retirement (Farquhar, Wrosch, Pushkar, & Li, 2013; Gagné, Wrosch & Brun de Pontet, 2011), but no study to date has examined disengagement in athletic retirement or examined the effect of motivation for retirement on disengagement and well-being.

Finally, Article 5 unifies and extends the findings of Articles 1 and 4 by introducing a motivational model of goal disengagement. Article 5 proposes that autonomous motivation to disengage (a sense of truly identifying with the decision to let go) as opposed to controlled motivation to disengage (feeling forced to let go) (i) increases progress towards goal disengagement, and (ii) reduces the severity of "inaction crises" during the course of disengagement. We define "inaction crises" as a state during disengagement during which an individual feels torn between disengaging further or re-adopting the abandoned goal. Both (i)

motivation for goal disengagement and (i) inaction crises are novel constructs and constitute theoretical contributions to SDT and Goal Adjustment Theory. Article 5 also documents the first instance of using both motivation for goal engagement and motivation for goal disengagement to predict disengagement progress from an abandoned goal. This work expands our understanding of the role of autonomous motivation throughout a goal's lifecycle and helps integrate different theoretical frameworks on goal motivation and self-regulation.

General Introduction

"And now here is my secret, a very simple secret: It is only with the heart that one can see rightly; what is essential is invisible to the eyes."

—Antoine de Saint-Exupéry, The Little Prince

"*There is no greater agony than bearing an untold story inside you."*

—Maya Angelou, I Know Why the Caged Bird Sings

"Hateful to me as the gates of Hades is that man who hides one thing in his heart and speaks another."

—Homer, The Iliad, Book 9

As seen through a motivational psychologist's lens, the literary quotes above capture the primary distinction that Self-Determination Theory makes between autonomous and controlled motivation (SDT, Deci & Ryan, 2000; Ryan & Deci, 2017). SDT, a macro theory of human motivation, defines autonomous motivation as a sense of authentically and wholeheartedly endorsing one's actions. When 'The Little Prince' reveals that "it is only with the heart that one can see rightly", he is speaking about the power of acting in line with one's internal values and interests. Indeed, autonomous behaviors are experienced as freely emanating from the self, and reflecting a true expression of one's being. While "the eyes" may be deceived by appearances, enticed by rewards, or distracted by frivolities, it is with "the heart" – one's soul or internal moral compass – that one can see what truly matters in one's life. By contrast, Maya Angelou and Homer's quotes capture the agony felt by those who behave in ways that do not accord with

the authentic self. Controlled motivation is characterized by a sense of internal or external pressure to act, often alienating the person from their priorities and values. Controlled behaviors are instrumentally performed to obtain rewards, avoid punishments, or to reduce unpleasant affective states, but bear the price of betraying one's genuine character.

The role of autonomous and controlled motivation in personal goal pursuit has been an integral focus of SDT, with dozens of studies demonstrating that autonomous motivation for pursuing a goal optimizes pursuit and leads to desirable outcomes such as goal progress, attainment, and increased well-being (Koestner, Lekes, Powers & Chicoine, 2002; Koestner Otis, Powers, Pelletier & Gagnon, 2008; Sheldon & Elliot; 1998; 1999; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 1998). Meanwhile controlled motivation for goal pursuit has been weakly and inconsistently associated with goal outcomes (Judge et al., 2005; Koestner et al., 2008).

The present thesis set out to uncover how the two different forms of motivation relate to goals when pursuit becomes overly demanding, setbacks and difficulties set in, or goal disengagement occurs. Importantly, we sought to integrate SDT with other theoretical frameworks that focus on distinct later phases in the goal's lifecycle, such as the action crisis that is characterized by goal stagnation and conflict (Brandstätter, Hermann & Schüler, 2013) and (2) goal disengagement which involves relinquishing effort and commitment towards an unattainable goal (Goal Adjustment Theory; Wrosch, Scheier, Carver & Schultz, 2003).

In line with the quotes above, the present thesis sought to establish whether, in parallel to the role of motivation during goal pursuit, the process of disengaging from a personal goal is also regulated by autonomous motivation. Importantly, we sought to demonstrate that autonomous

motives for goal disengagement facilitate disengagement progress from a personal goal. Further, we investigated whether controlled motivation for goal pursuit was associated with costs to the pursuer, in terms of declines in mental and physical health, as well as increased stress and frustration of basic psychological needs. In summary, the aim of this thesis was to examine the roles of autonomous and controlled motives across the goal's full lifecycle.

Personal Goals

Described as "the linchpin of psychological organization" (Klinger, 1998, p. 44), the centrality of personal goals in human functioning has been widely documented (Brunstein, 1993; Carver & Scheier; 1998; Emmons, 2003; Sheldon, & Church, 1997; Sheldon, 2014; Zirkel & Cantor, 1990). Personal goals are conceptualized as mental representations of desired outcomes that allow people to plan and structure goal-directed behavior (Gollwitzer, 1999), apply skills, monitor goal progress (Harkin et al., 2016), and reach desired outcomes (Carver & Scheier, 1998). In turn, goal pursuit is robustly linked to people's well-being and life satisfaction (Brunstein, 1993; Deci & Ryan, 2017; Diener, Lucas, & Oishi, 2002). Indeed, some have suggested that the most effective route to increasing one's long-term well-being is through the selection and pursuit of meaningful personal goals (Emmons, 2003).

Goals imbue individuals' lives with a purpose for living, as they often relate to a person's values, interests and priorities (Carver & Scheier, 2005). Whether studied as "current concerns" (Klinger, 1975), "personal projects" (Little, 1983), "personal strivings" (Emmons, 1985), "possible selves" (Markus & Ruvolo, 1989) or "life tasks" (Sanderson & Cantor, 1999), there is consensus that goals can be energizing and contribute to life-long patterns of successful development (Carver & Scheier, 1998; Emmons, 2003; Heckhausen, Wrosch & Schultz, 2010;

2019). Moreover, peoples' personal goals offer a window into their psyche and help us understand who they are. Goals represent the "personal concerns" tier of personality, which McAdams (1996) argued is one of the three major aspects of personality that - along with "dispositional traits" and an overarching "self-narrative" – are necessary to know a person well.

Recent developments in the goal literature suggest that goals have a "lifecycle" and that their pursuit is characterized by different phases. The ''Rubicon model of action phases" posits four distinct phases of goal pursuit (Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987). Individuals start out in a process of *deliberation* when considering which goal to select and pursue. After weighing the pros and cons among different options, the individual crosses a decisional "Rubicon" to commit to a specific goal. Upon crossing the "Rubicon", the pursuer enters a new action phase focused on goal *implementation*, rather than deliberation. In the implementation phase the pursuer decides where, when, and how he or she will pursue the desired goal. In the *actional* phase, the pursuer initiates goal-directed behaviours. Finally, after making headway with the goal, the individual enters an *evaluation* phase which is characterized by self-reflection. At this time, the individual makes an assessment as to whether the pursuit can be terminated or should be maintained.

While not specified in the Rubicon model, recent research suggests that pursuers mired in obstacles and setbacks during the *actional phase* of goal striving may experience an *action crisis*. During an action crisis, the pursuer feels torn between persevering with the goal or cutting losses and initiating goal disengagement (Brandstätter, Hermann & Schüler, 2013). The action crisis resolves either through re-invigorated effort and commitment, or a decision to initiate *goal disengagement* (Wrosch et al., 2003).

As personal goals are a vital source of sustained well-being, it is useful to consider motivational theories that can reliably predict the types of goals that are likely to be fueled by prolonged effort and result in greater goal progress. SDT makes important predictions about the kind of motivational elements that facilitate goal progress and result in enhanced well-being (Sheldon & Elliott, 1999; Sheldon, 2014). The majority of SDT goal research has focused on the earlier phases of the Rubicon model, demonstrating how autonomous motivation optimizes the selection and implementation of personal goals.

Self-Determination Theory (SDT) – An Organismic Theory of Human Behaviour

SDT is an empirically based, *organismic* theory of human behavior and personality development (Ryan & Deci, 2017; Deci & Ryan, 2000). The theory holds an organismic perspective because it assumes that humans have evolved to be inherently curious, social, and active beings that are interested in their surroundings, strive to gain mastery, and desire to connect with others. Human beings are universally oriented towards these behaviors because they seek to satisfy three basic psychological needs: autonomy, competence and relatedness. These needs thought of as 'nutrients' imperative for a human being's psychological growth, flourishing, and well-being, (Ryan & Deci, 2017).

The need for *autonomy* refers to our need to feel ownership and choice over our experiences and actions (deCharms, 1968; Ryan, 1993). Autonomy is different from constructs such as independence, egoism, or self-reliance because individuals can feel autonomously dependent or interdependent, so long as this dependence is in line with the person's values, choices and preferences (Ryan & Deci, 2017). *Competence* refers to our need to operate effectively in the environment or feel capable of learning the skills necessary to operate

effectively in the environment (Bandura, 1989; Deci, 1975; White, 1959). *Relatedness* refers to our need to feel socially connected with others, to care for them, and feel cared for in return (Baumeister & Leary, 1995; Ryan, 1995).

Taken together, the satisfaction of these three needs leads to psychological flourishing. However, not only can low satisfaction (i.e., need deprivation) of any of these needs hamper psychological and developmental growth, but *need frustration* can be especially harmful (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011). The frustration of basic psychological needs, which occurs when exposed to harsh, controlling, or rejecting social environments, can increase the risk for ill-being and pathological functioning (Vansteenkiste & Ryan, 2013). Thus, need satisfaction and need frustration are considered to be crucial mechanisms in both optimal, positive functioning and non-optimal, pathological functioning (Deci & Vansteenkiste, 2004).

Organismic Integration Theory and the Reasons Underlying our Goals

Within SDT, a mini-theory called the Organismic Integration Theory (OIT) of goal striving has been proposed, which differentiates between the underlying motivations of goals (Ryan & Deci, 2017). According to the OIT, motivation is not considered in terms of quantity (i.e., "How much motivation does someone have?"), but instead in terms of quality (i.e., "What kind of motivation does someone have?"). The quality of motivation underlying a specific complex behavior like personal goal can be, to varying degrees, both autonomous and controlled (also referred to as self-concordant; Sheldon, 2014). For example, one could strive to become a doctor for wealth and societal recognition (controlled motivation) as well as for interest and curiosity (autonomous motivation).

Autonomous motivation can be thought of as “want to” or “get to” motivation (Inzlicht, Schmeichel & Macrae, 2014; Milkman, Rogers, & Bazerman, 2008) and is comprised of intrinsic, integrated and identified motives (Deci & Ryan, 2000; Ryan & Deci, 2017). *Intrinsi*c motivation is the prototypical form of autonomous motivation. It involves pursuing a goal or enacting a behavior for the sheer interest and enjoyment of the activity, such as reading a gripping book to satisfy one’s curiosity about the plot, or taking a walk on the beach to feel the soothing sensation of the waves lapping one’s feet.

However, most daily activities are not inherently satisfying – few would say they wake up at 5 a.m. to exercise or take out the garbage for the thrill of these tasks – and yet, people can perform these tasks willingly. While these activities are instrumental, that is, performed to bring about a desired outcome other than the inherent enjoyment of the task, they can still be autonomously regulated. The key is the degree to which the value of the activity has been actively internalized and integrated into the self. *Integrated* motives describe instances where the task or activity has been fully assimilated into one’s sense of self and harmonizes with one’s other core values. *Identified* motives describe instances where one recognizes the importance or relevance of the task (Deci & Ryan, 2017).

Contrasted with autonomous motivation is controlled motivation, which includes external regulation and introjection (Ryan & Deci, 2017). *External* regulation involves doing an activity to obtain a positive reinforcement or avoid a negative reinforcement in the environment. Whether working overtime to comply with one’s boss’ instructions, studying hard to please one’s demanding parents, or preparing dinner to circumvent a fight with one’s partner; external regulation is the most extrinsic form of motivation. However, sometimes these external demands

are partially integrated – instead of fearing a boss' reprimand or parents' disappointment - one's own feelings of guilt and shame compel the action. This is referred to as *introjected* motivation and involves doing something out of internal feelings of obligation or pressure. Both external and introjected motives can be thought of as "have to" or "got to" motivation (Inzlicht, Schmeichel & Macrae, 2014; Milkman, Rogers, & Bazerman, 2008).

Early research investigating the degree of autonomous and controlled motivation underlying personal goals assessed the goal's "perceived locus of causality" (PLOC) (Ryan & Connell, 1989). The PLOC captured the extent to which people viewed their own behavior as caused by internal factors, such as their interests and values (I-PLOC, or autonomous motivation), or as caused by external factors, such as pressure from other people (E-PLOC, or controlled motivation). Once participants rated a goal's PLOC, researchers could compute a relative autonomy index by summing intrinsic and identified scores and subtracting external and introjected scores. This index located the motivated behavior upon a continuum of internalization, ranging from high relative autonomy to low relative autonomy (Ryan & Connell, 1989).

However, developments in motivation research suggested that there were several important reasons why autonomous and controlled motivation should not be aggregated for goal research. First, a meta-analysis of 12 studies indicated that autonomous and controlled goal motivation were not significantly correlated (Koestner et al., 2008). Second, researchers found that only autonomous goal motivation was significantly associated with goal progress (d =.41, r =.20), highlighting that the different regulations appeared to produce different outcomes, not just different levels of the same outcome (Koestner et al., 2008). Third, a study by Chemolli and

Gagné (2014) demonstrated a lack of support for the relative autonomy index's continuum structure, further supporting the need to separate the two forms of goal motivation.

Evidence suggests that autonomous motivation is the "active ingredient" for bringing about positive goal outcomes. Specifically, autonomous motivation is thought to optimize goal pursuit because it is associated with adaptive processes including greater ease of effort (Werner, Milyavskaya, Foxen-Craft & Koestner., 2016), decreased conflict between goals (Kelly, Mansell, & Wood, 2015), the perception of fewer future obstacles (Leduc-Cummings, Milyavskaya, & Peetz, 2017), and more effective use of implementation plans (Koestner, Lekes, Powers, & Chicoine, 2002; Koestner et al., 2006). Notably, the positive effect of autonomous goal motivation on goal progress has replicated across shorter (Downie, Koestner, Horberg, & Haga, 2006) and longer intervals (Sheldon & Houser-Marko, 2001), and regardless of whether goals are aggregated across domains (Sheldon & Elliot, 1999) or domain-specific (Judge, Bono, Erez, & Locke, 2005).

Meanwhile controlled goal motives appear to be weakly associated with goal outcomes, and are not always significantly negatively related to autonomous motivation (Judge et al., 2005; Koestner et al., 2008). A possible explanation is that controlled motivation depends on external contingencies, and therefore its effects rely more on variations in the pursuer's environment (Koestner et al., 2008). These studies suggest that controlled motivation is an "inactive" but harmless factor in goal striving. However, one of the aims of this thesis was to investigate whether controlled motivation during goal striving was problematic beyond being ineffective. Akin to the argument that need frustration is more detrimental than low need satisfaction (Vansteenkiste & Ryan, 2013); controlled motivation may be associated with maladaptation

beyond the effects of low autonomous motivation. For example, in a sample of school children Ryan and Connell (1989) found different regulations were associated with different coping strategies and that only controlled regulations (i.e., external and introjected regulations) were related to anxiety toward school, whereas only autonomous regulations (i.e., identified and intrinsic regulations) were related to enjoyment.

In addition to considering the role of controlled motivation in maladaptation, the studies of this thesis set to uncover whether autonomous and controlled motives are associated with goal stagnation, conflict and disengagement. To date four studies have investigated the effects of autonomous and controlled motivation for adjusting to difficult or unattainable goals (Mulvihill, Guimette, Barker & Bianco, 2018; Ntoumanis et al., 2014a; Ntoumanis, Healy, Sedikides, Smith & Duda, 2014; Smith & Ntoumanis, 2014). These studies relied primarily on brief experimental manipulations of exercise tasks or vignette-based scenarios and were conducted in samples of young adult athletes. For example, Smith and Ntoumanis (2014) found that when athletes held autonomous motives for pursuing a sports goal the athletes expected that it would be harder for them to disengage from the goal. These studies were the first to address the possible role of motivation in goal disengagement, but faced some limitations that we hoped to address in the current thesis. For example, these studies only considered motivation for goal engagement, whereas we propose that people can have *both* motives to engage with and disengage from a personal goal. In addition, these studies did not consider the role of goal motivation in predicting action crises (a phase in goal striving that precedes goal disengagement).

Action Crises in Goal Pursuit

When an individual encounters obstacles and difficulties in the pursuit of their personal goals, there is often a tension between two opposing motivational forces: continuing goal pursuit or abandoning the goal (Wrosch & Scheier, 2019). The individual can heighten goal commitment and redouble efforts, with the hope of overcoming the obstacles, or relinquish the goal and move on to more feasible pursuits. The consequences of choosing the wrong strategy can be devastating. Relinquishing a goal too early can result in missed opportunities and a loss of goal-related investments (Heckhausen et al., 2010). However, persisting with a difficult goal fruitlessly will also erode resources and have negative implications for the individuals` mental and physical health (Wrosch et al., 2013).

Weighing and deliberating these two options can result in what researchers have called an *action crisis*, which is defined as a an intra-psychic decisional conflict during which an individual finds themselves torn between continued goal engagement and goal disengagement (Brandstätter et al., 2013). Although an action crisis does not inevitably result in goal disengagement "an action crisis prepares the ground for disengagement" (Herrman & Brandstätter, 2013, p.881) and more severe action crises tend to result in earlier goal disengagement (Herrman & Brandstätter, 2015).

Action crises in goal pursuit are thought to activate cognitive processes that lead individuals to question their goal's desirability (i.e., the value attributed to the goal) and attainability (i.e., the expectation that the goal can be attained). Drawing from the mindset theory of action phases (Gollwitzer, 1990, 2012) Brandstätter and Schüler (2013) propose that the action crisis promotes a shift in mindset during goal pursuit (Brandstätter & Schüler, 2013), such that individuals turn away from the "implemental mindset" back towards the "deliberative mindset" associated with the pre-decisional phase of weighing options. As a result of this shift in

mindset, action crises are associated with devaluating the goal's desirability and attainability (Ghassemi, Bernecker, Herrmann & Brandstätter, 2017).

Being stuck in a prolonged or severe action crisis may also compromise well-being and physical health. Action crises are associated with decreased life satisfaction, increased negative affect (Brandstätter et al., 2013) and increased symptoms of depression (Holding, Hope, Harvey, Marion-Jetten & Koestner, 2017). Moreover, action crises have been associated with maladaptive physical outcomes such as increased somatic symptoms (e.g., headaches; Brandstätter et al., 2013), poorer physical performance (Brandstätter et al., 2013), and delayed recovery in patients (Wolf, Herrmann, Zubler & Brandstätter, 2018). In the present thesis we sought to examine how autonomous and controlled goal motivations relate to the emergence of action crises in goal pursuit.

Disengagement from a Personal Goal

One path to resolving an action crisis is to disengage, which means withdrawing *psychological commitment* and *behavioral effort* from the goal (Wrosch et al., 2003). While disengagement from trivial goals is easy (Wrosch et al., 2003), individuals tend to cling to valued goals even after their appeal has faded and progress has stagnated (Sleesman, Conlon, McNamara, & Miles, 2012). In the words of Carver and Scheier (2005, p.535) "people often […] struggle well past the point where the goal has been lost". This is likely because rupturing with a valued goal means losing invested resources, and in many cases, an aspect of one's identity (Carver & Scheier, 2005). Individuals averse to the losses of disengagement may be tempted to continue striving for the goal, enhancing their commitment to the faltering pursuit in order to justify previously invested resources (see "maladaptive cycle of entrapment"; Brockner, 1992).

This highlights the *disengagement paradox* that Carver and Scheier (2000, p. 62) alluded to when they asked, "Is the disengagement tendency good or bad?" Goal disengagement is antithetical to goal attainment, and is therefore viewed as a negative outcome when emphasis is placed on self-efficacy and goal progress (Bandura, 1997). However, as mounting obstacles and dwindling resources take their toll on the goal pursuer, goal disengagement may be a positive outcome if emphasis is placed on the individual's well-being, health, and overall adaptive functioning (Barlow, Wrosch & McGrath, 2019). Only by relinquishing the problematic goal can the goal pursuer stave off the negative psychological states that accompany fruitless goal investment, such as stress, intrusive thoughts, rumination, depressed mood, and negative affect (Johnson, Panagioti, Bass, Ramsey, & Harrison, 2017; Wrosch et al., 2013). Moreover, given that resources for goal pursuit are finite (Baumeister, Tice, & Vohs, 2018), remaining stuck with a goal will decrease the likelihood of investing time and energy in feasible alternatives (Wrosch et al., 2003), which may thwart additional opportunities to experience positive emotions as a result of goal successes in other domains (Wrosch et al., 2013).

Abandoning goals was historically viewed as an unfavorable consequence of goal failure (e.g., "learned helplessness", Wortman & Brehm, 1975), and received sparse attention in the literature on adaptive self-regulation prior to the 1990s. Instead, goal persistence was considered adaptive, because it maximized the chances of goal attainment (Bandura, 1997; Taylor & Brown, 1988). Broaching the notion of "disengagement" from a theoretical and clinical perspective, the writings of Eric Klinger prove an important exception. As early as 1975, Klinger noted that "Terminating [goal pursuit] short of goal attainment requires an active countervailing process" (Klinger, 1975, p.7). Indeed, Klinger characterized the process of disengaging from a valued goal as lengthy and difficult, comparable with a "psychic earthquake that sends shudders and rumbles

through a person's life" (Klinger, 1977, p. 137). To delineate the process of disengagement, Klinger (1975) proposed an *incentive-disengagement cycle* with four distinct phases.

The incentive-disengagement cycle begins with the *invigoration phase* during which an individual increases commitment to a goal in the face of difficulties and obstacles. During this phase, the blocked goal becomes more attractive and desirable, to the point that the individual becomes over-involved with the goal and "loses perspective" with regards to other incentives (Klinger, 1975, p.9). If the obstacles prove insurmountable and goal-related efforts remain frustrated, the individual enters a phase of *aggression*. Eventually, continued frustration about ineffectual goal pursuit sends the pursuer into a state of *depression.* The individual becomes apathetic and relinquishes commitment to all pursuits, including commitment to the blocked goal. Klinger (1975) considers this state of depression as a normal and adaptive part of disengaging from an incentive. The incentive-disengagement cycle ends when the individual enters a phase of *recovery*, during which the apathy subsides and the individual opens themselves to alternate incentives (Klinger, 1975).

Researchers have since come to test the theoretical propositions outlined in Klinger's writings (Ghassemi et al., 2017; Wrosch & Miller, 2009), finding support for Klinger's notion that disengagement from a blocked incentive is an adaptive self-regulatory response (Wrosch & Schultz, 2010; 2019). For example, in the health context, Sprangers and Schwartz (1999) found that patients confronted with a life-threatening or chronic disease can optimally adapt to their illness if they engage in a 'response shift' which involves changing their conceptualization of quality of life. Similarly, in the context of successful ageing, Brandtstädter and Renner (1990) proposed a model of coping with life transitions that emphasizes flexibly in adapting to restrictions imposed by new life circumstances. Goal adjustment theory, which is often applied

in health and aging research but not restricted to these domains, explicitly proposes that the most adaptive response to an unattainable goal is goal adjustment, which entails both disengaging from the unattainable goal and reengaging in alternative goals (Wrosch et al., 2003).

Goal disengagement is thought to improve the pursuer's quality of life via two pathways (1) enhancing the motivational resources that the individual can devote to more feasible pursuits (Wrosch et al., 2003) and (2) reducing stress by preventing experiences of repeated failure and rumination about the blocked goal (Mens et al., 2015).

In support of these propositions, the capacity to disengage is strongly associated with a reduction in negative psychological states (Coffey, Gallagher, & Desmond, 2014; Dunne, Wrosch, & Miller, 2011; Wrosch et al., 2003; Wrosch, Amir, & Miller, 2011) and can benefit biological functioning and physical health (e.g., lower cortisol secretion, lower systemic inflammation, and less symptoms of illness; Castonguay, Wrosch & Sabiston, 2014; Jobin & Wrosch, 2016; Miller & Wrosch, 2007; Wrosch, Bauer, Miller & Lupien, 2007; Wrosch, Miller, Scheier, & De Pontet, 2007; Wrosch et al., 2013).

For whom is goal disengagement relevant? Research examining the experience of unattainable goals suggests that encountering blocked goals is relatively common phenomenon that many people will experience throughout their lifetimes, especially due to age-normative reasons such as health problems or elapsed developmental/biological deadlines (Heckhausen et al., 2010; 2019). However, unattainable goals can also be confronted earlier in the lifespan, if the chosen goal (e.g., competing in the Olympic Games) becomes unrealistic (e.g., due to injury), or was lofty and unrealistic to begin with. Even reasonable and developmentally appropriate goals may become unattainable in circumstances of heightened stress, illness, or competing urgent demands.

While confronting blocked goals is a common experience, individuals are thought to vary in how they cope with this experience. Goal adjustment theorists posit that successfully relinquishing unattainable goals is a process that is largely governed by personality characteristics (Mens et al., 2015). Much of the research in this area has therefore used a dispositional measure of goal adjustment capacity which assesses both goal disengagement capacity (i.e., the ability to withdraw of effort and commitment in the face of blocked goals across contexts) and goal reengagement capacity (i.e., the ability to identify, commit to and pursue new goals across contexts; Wrosch et al., 2003). Specifically, individuals with lower goal disengagement capacity are thought to have a difficult time disengaging from unattainable goals across contexts, irrespective of the specific goal. Meanwhile, individuals with greater goal disengagement capacity are thought to consistently adjust to the experience of unattainable goals with relative ease (Wrosch et al., 2013).

Drawing on the assertion that "not all goals are created equal" (Ryan, Sheldon, Kasser & Deci, 1996) we sought to understand goal disengagement from a SDT perspective and propose that motivation may represent a goal-specific factor in determining successful disengagement. That is, in addition to acknowledging that people vary in their general capacity to disengage from unattainable goals across contexts, we propose that people's motives for disengaging from a specific goal are essential to the prediction of whether they are able to successfully disengage.

The Present Work

Using novel hypotheses and contemporary analytic methods, the present work examined whether goal motivation is an antecedent of action crises; need sacrifice, and goal disengagement.

Article 1 describes an 8-month longitudinal study (N = 425) examining the role of autonomous and controlled motivation for the development of action crises in goal pursuit. We

hypothesized that autonomous motivation for goal pursuit would reduce the severity of action crises in goal pursuit; whereas controlled motivation for pursuing goals would make people more vulnerable to the experience of action crises. Importantly, we expected the effects of goal motivation to relate significantly to action crisis severity over-and-above relevant individual differences (e.g., action orientation). By tracking participants' pursuit of three goals, we were able to analyze our data using multilevel modelling, which is novel in the context of action crisis research.

Article 2 further probed the role of controlled goal motivation and action crises in stress and ill-being during goal striving. Using a novel hair cortisol sampling methodology, we conducted an 8-month longitudinal study (N=156), tracking university students' pursuit of personal goals. In addition to sampling participants' hair for the stress hormone cortisol at the beginning and end of the academic year, we also assessed self-reported stress, physical health symptoms, and symptoms of depression. We expected action crises in goal pursuit would be positively associated with increases in markers of stress and ill-being over the course of the academic year. Moreover, we expected controlled motivation for personal goals to be indirectly associated with increased markers of stress and ill-being via action crisis severity.

While Articles 1 and 2 describe how controlled goal pursuit can result in greater action crises, Article 3 introduces another psychological process that can arise during controlled goal pursuit: basic psychological needs sacrifice. We define basic psychological needs sacrifice as the renouncing of opportunities to satisfy the basic psychological needs of autonomy, competence and relatedness in the service of attaining an important goal. In two, 3-wave prospective longitudinal samples of university students pursuing a career goal (N combined = 583) we investigate the antecedents and consequences of psychological needs sacrifice, predicting that

this sacrifice would stem from controlled motives for the career goal and lead to negative affective and self-regulatory consequences.

Transitioning from earlier phases of the goal's lifecycle, Article 4 describes a study examining the motivational antecedents and consequences of goal disengagement in a sample of professional athletes disengaging from their athletic careers in retirement (N=158). The objectives of Article 4 were to conceptualize the transition into athletic retirement as a form of disengagement, and to introduce SDT motivation factors as predictors for disengagement from a terminated athletic career. Moreover, we examined how autonomous motivation for retirement and disengagement progress impacted athletes' well-being in retirement. We hypothesized that athletes retiring for autonomous reasons (e.g., wanting to start a new career) as opposed to controlled reasons (e.g., injury) would make greater progress disengaging from their athletic careers and would experience greater subjective well-being in retirement.

Lastly, building on the findings of the athlete retirement study, Article 5 describes a series of three longitudinal studies (N combined = 1381) that introduce a motivational model of goal disengagement. Using prospective longitudinal designs, we track disengagement from a personal goal in a sample of university students (Study 1, N = 510) and a general adult sample of Americans (Study 2, N= 446). We propose that having autonomous motivation to disengage from a blocked goal (i.e., a sense of truly identifying with the decision to disengage) as opposed to controlled motivation to disengage (i.e., feeling forced to let go) will allow individuals to make greater progress disengaging from a problematic or unattainable goal. Moreover, we propose that holding autonomous motives for disengaging will protect individuals from getting stuck in an "inaction crisis" (a phase that occurs after disengagement has been initiated, in which the individual feels torn between disengaging further and re-adopting the abandoned goal). In

Study 3 (combined N = 935) we track two samples of participants pursuing personal goals with the aims of (1) using motivation for goal engagement to predict which goals will be relinquished, (2) using motivation for goal disengagement to predict which of the relinquished goals will be successfully disengaged from.

Article 1

Stuck in limbo: Motivational antecedents and consequences of experiencing action crises in personal goal pursuit.[1]

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Abstract Article 1

***Objective*.** Action crises describe the intrapsychic conflicts individuals experience when they feel torn between further goal pursuit and goal disengagement. The present investigation introduces autonomous and controlled motivation as independent predictors of action crisis severity, beyond known personality level predictors (action orientation), and novel personality level predictors (neuroticism and conscientiousness).

Method. Using a multi-wave prospective longitudinal design and multilevel modeling (MLM) we followed students pursuing 3 personal goals across an academic semester (N = 425 undergraduates, 76% female, 57% Caucasian, M_{age}= 20.2, *SD* =2.3). In two follow-up surveys, participants reported on the severity of their action crises, goal progress, and symptoms of depression.

Results. Results suggest that autonomous motivation shields individuals from experiencing action crises, while controlled motivation represents a risk factor for developing action crises beyond personality level predictors. Furthermore, MLM revealed that autonomous motivation is a significant predictor of action crisis severity at both the within- and between person levels of analysis. Action crises mediate both the relationship between autonomous motivation and goal progress, and the relationship between controlled motivation and symptoms of depression.

Conclusions. The implications of these findings for the prevention of action crises and motivation research are discussed.

Keywords*: Action crises, motivation, personality, goal progress, symptoms of depression.*

Stuck in limbo: Motivational antecedents and consequences of experiencing action crises in personal goal pursuit.

The pursuit of goals represents a central task in personal development with important consequences for well-being, adjustment and personal growth. Imagine two college students pursuing the ambitious personal goal of "being accepted to medical school". The first student chose this goal freely and wholeheartedly – she finds her biology coursework fascinating and spends much of her free time volunteering at the local hospital. The second student expresses some degree of interest in the health sciences but also feels pressured to become a doctor – she feels like she ought to strive for the medical profession given her track record of academic excellence. Both students are likely to experience setbacks and obstacles in their pursuit of this goal, for example, an uncompetitive score on a standardized entrance exam or writers block on the admissions essays. The students may also have informative experiences that lead them to question their goal, such as a conversation with a doctor who complains about poor quality of life, or a career information session advertising for exciting alternative professions. These setbacks, challenges or informative experiences may result in an action crisis: a decisional conflict about whether to persevere and invest further in the goal, or to cut losses and begin goal disengagement (Brandstätter, Hermann & Schüler, 2013). We propose that people's autonomous and controlled goal motivation are useful predictive factors in determining susceptibility to the development of action crises in personal goal pursuit, beyond dispositional self-regulation associated with goal progress. Research on goal self-concordance has shown that "not all personal goals are personal" (Sheldon & Elliot, 1998), indicating that personal endeavors can emanate from both autonomous reasons for action (such as interest and genuine task enjoyment) as well as controlled reasons (such as external incentives and internal pressures). The first

student's genuine enjoyment of tasks related to her goal, as well as the goal's harmonious integration with her values and identity, could shield her from the decisional conflict and rumination associated with an action crisis. In turn, this might allow her to make greater progress with her goal over time. In contrast, we might expect the second student with relatively more controlled reasons for "being accepted to medical school" to be more vulnerable to a decisional conflict in the face of setbacks, obstacles or attractive alternatives, since the goal does not reflect her genuine interests. The second students' susceptibility to a severe action crisis might contribute to increased negative affect, such as feelings of helplessness and disappointment over time. Ultimately, this may result in increased symptoms of depression.

Action crises

While self-regulation research traditionally focused on goal attainment (Bandura, 1977; Carver & Scheier, 1981), the field has expanded to consider goal disengagement – the relinquishing of behavioural effort and psychological commitment - from unattainable pursuits (Wrosch, Scheier, Miller, Schulz & Carver, 2003). Action crises are defined as an intra-psychic decisional conflict between further goal pursuit and goal disengagement (Brandstätter & Schüler, 2013). The concept of action crises arises from Klinger's (1977) notion that goal pursuit and goal disengagement are not discrete and mutually exclusive states. As such, action crises have been described as a transitional phase in goal striving where individuals find themselves torn between continued goal engagement and goal disengagement (Hermann & Brandstätter, 2013; 2015). The decisional conflict associated with action crises is thought to precede goal disengagement, although not every action crisis necessarily results in goal disengagement. Indeed, action crises can be overcome or resolved through perseverance and adaptations to the goal striving process (Herrman & Brandstätter, 2013). Nevertheless, the severity of an action crisis has been shown to

longitudinally predict the onset of disengagement, with more severe action crises tending to result in earlier goal disengagement (Herrman & Brandstätter, 2015).

Action crises typically result from a loss of goal attainability and/or goal desirability (Brandstätter & Schüler, 2013; Hermann & Brandstätter, 2013). A goal might be perceived as less attainable when goal pursuit is met with recurring setbacks, obstacles and difficulties, or when a sudden change in life circumstance depletes resources, instills goal-related doubts and implementation disorientation (Brandstätter & Schüler, 2013; Brandstätter et al., 2013). Likewise, a goal may be perceived as less desirable when the pursuit becomes tedious, requires excessive sacrifices, interferes with other valued goals, or appears less attractive with the emergence of new information, tempting alternatives, or interesting opportunities.

Action crises have been associated with affective, physiological, and cognitive consequences. Brandstätter et al. (2013) showed that the intensity of action crises in personal goals was predictive of decreased life satisfaction and reduced positive affect. Action crises have also been associated with increased health complaints (Brandstätter et al., 2013; Hermann & Brandstätter, 2013), as well as markers of increased physiological stress (i.e. increased cortisol secretion) and decreased running performance in marathoners (Brandstätter et al., 2013). Finally, action crises have been associated with a devaluation of a goal's perceived attainability and desirability, and an increased re-evaluation of goal-related costs and benefits (Brandstätter & Schüler, 2013). The adverse well-being and health consequences associated with action crises suggest that individuals might benefit from avoiding this state of conflict and doubt. Moreover, the effects of maladaptive goal persistence on health and well-being are well documented in the goal disengagement literature (Wrosch, Scheier, & Miller, 2013). However, some researchers have postulated the adaptive potential of action crises, if resolved in a limited

timeframe (Hermann & Brandstätter, 2013). The goal re-evaluation and cost-benefit analysis associated with a decisional conflict may bring about heightened goal commitment, or conversely, a sensible decision to relinquish a problematic goal (Brandstätter & Hermann, 2015).

Dispositional Predictors of Action Crises

Psychological research has recently started to uncover dispositional predictors of action crises. One individual difference measure that has received attention in the field is action (vs. state) orientation. Action orientation is concerned with characteristic differences in the pursuit and maintenance of goals through emotion control, performance efficiency, and information-processing mechanisms, such as allocation of attention and inhibition of extraneous cognitions (Kuhl & Goschke, 1994). The disposition towards action vs. state orientation is considered in two circumstances: action orientation subsequent to failure (AOF) and decision-related action orientation (AOD) (Kuhl & Beckman, 1994). AOF is concerned with the ability to self-regulate and reduce negative affect subsequent to a failure experience (action orientation), as opposed to becoming preoccupied with the failure and ruminating about it (state orientation). AOD describes an individual's ability to act upon decisions quickly (action orientation) instead of hesitating to initiate an intended activity (state orientation). Hermann and Brandstätter (2013) found that dispositional action orientation shielded individuals from experiencing action crises and enabled individuals to resolve these crises when they arose. Herrmann & Brandstätter (2013) also showed that the positive effect of action orientation on well-being is partially mediated by action crises. In the present study, action vs. state orientation is used as a covariate**.**

However, with the exception of action orientation, other personality constructs have not been examined. Brandstätter et al.(2013, p.13) suggested that other candidate personality variables such as neuroticism (Costa & McCrae, 1992) and general goal adjustment tendencies

(i.e. the dispositional ability to disengage from unattainable goals and reengage with new pursuits, Wrosch et al., 2003) might also be relevant in the prediction of action crises. Neuroticism is an established determinant of well-being (Lykken & Tellegen, 1996), and may be related to the ruminative component of an action crisis (Nolan, Roberts & Gotlib, 1998). However, the relationship between neuroticism and goal-related processes is less clear. For example, research has found that effects of self-concordance on goal progress are not reducible to the effects of neuroticism (Sheldon & Marko-Hauser, 2001). The personality trait most directly linked to goal progress is conscientiousness (Romero, Villar, Luengo & Gómez-Fraguela, 2009), which is often defined in terms of the extent to which individuals are goal-oriented, industrious, and achievement-focused (Costa & McCrae, 1992). Thus, in the present study, we included measures of conscientiousness, neuroticism and goal adjustment tendencies, to determine the effects of these personality variables on the development of action crises. Importantly, in addition to investigating these personality level constructs, the present investigation sought to examine the unique contribution of motivational predictors of action crises.

Autonomous and Controlled Motivation in Goal Pursuit

The self-concordance model of goal striving (Sheldon & Elliot, 1999), developed as an extension of self-determination theory (SDT) (Deci & Ryan, 2012), examines longitudinal increases in well-being, psychological growth, and personality development as a function of successfully pursuing self-concordant goals. Self-concordant goals are thought to arise from a person's life-long evolving interests and their core values (Sheldon & Elliot, 1999). Importantly, this model examines the extent to which goals are pursued for autonomous and controlled reasons, making a distinction in individual's perceived locus of causality (PLOC) for pursuing

goals. The reasons for goal pursuit are thought to lie on a continuum of internalization, from externally regulated motivation (e.g. to obtain rewards or avoid punishment) to intrinsic motivation (e.g. doing something because it is inherently interesting and fun) (Ryan, 1995). Controlled motivation subsumes the two least internalized forms of motivation on the continuum: pursuing goals in response to external contingencies, such as rewards or punishments (external regulation), and pursuing goals out of internal feelings of obligation or pressure (introjected motivation). Autonomous motivation describes partially or fully internalized reasons for goal pursuit, such as choosing a goal because one believes the goal to be meaningful and important (identified motivation), because it truly represents personal values and interests (integrated motivation), or because the pursuit is fun and enjoyable in itself (intrinsic motivation).

Since autonomous goals reflect people's authentic values and interests, they allow individuals to draw upon volitional resources, such as sustained goal effort, to ensure consistent goal energization (for a review see Koestner, 2008; Sheldon, 2014). In the goal striving literature, autonomous motivation for goal pursuit has been robustly linked to sustained goal effort (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001), increased goal progress (Downie, Koestner, Horberg, & Haga, 2006; Judge, Bono, Erez, & Locke, 2005; Koestner et al., 2008), decreased goal ambivalence (Koletzko, Herrmann & Brandstätter, 2015), reduced temptation (Milyavskaya, Inzlicht, Hope, & Koestner, 2015), and increased goal attainment (Sheldon & Elliot, 1998, Sheldon & Houser-Marko, 2001). Furthermore, autonomous goal motivation has been shown to moderate the effect of implementation planning on goal progress, so that implementation plans are associated with relatively greater goal progress when combined with autonomous goals than when not combined (Koestner, Lekes, Powers & Chicoine, 2002).

As such, autonomous motivation for goal pursuit may be a protective factor for developing action crises. The sense of choice and ownership a person experiences when pursuing an autonomous goal might protect him or her from the procrastination, setbacks and implementation disorientation associated with action crises.

In contrast, controlled motivation has a weak and variable relationship with goal outcome measures such as goal progress and attainment (see Koestner et al., 2008; Gaudreau et al., 2012). These findings imply that effects of overall self-concordance on goal progress and attainment may be driven solely by autonomous motivation (Koestner, 2008). Since controlled motivation relies on the vicissitudes of the external situation, researchers have argued that controlled motivation exerts a less stable influence on behaviour over time and across situations (Koestner, 2008). Controlled motivation has been positively associated to participants' intended effort at the decisional phase of goal striving, but was not shown to translate into actual goal effort two and for weeks later (Gollwitzer, 1996). This finding suggests that people have trouble translating their controlled intentions to tangible activity at the actional phase of goal pursuit. Thus, when frustrations or setbacks set in, controlled goals may have a hard time competing against other appealing action tendencies, resulting in action crises. Controlled motivation has also been linked to increased conflict between goals. Downie et al. (2006) measured the extent to which participants' four personal goals were in conflict with one another vs. working well together. Results indicated a positive relationship between introjected goal motivation and experiencing conflict between goals, indicating that controlled motivation had a negative effect on the harmonious integration of peoples' goals. In the present study, we sought to extend this finding by examining the relationship between controlled motivation and conflict within personal goal pursuit (i.e. an action crisis). Since external and introjected goals tend to be less representative of

enduring interests and values (Ryan, 1995), the volitional strength behind them is likely to fade once obstacles are encountered (Gollwitzer, 1990). Extrinsically motivated action clearly holds the potential for a mismatch between external demands and internal desires, values, and interests. The partial or incomplete integration of introjected goals with the self may also lead to inner conflict and feelings of ambivalence (Deci & Ryan, 2012; Koletzko, Herrmann & Brandstätter, 2015). As such, the feelings of pressure and demand associated with a controlled goal may represent a risk factor for developing action crises. In turn, feeling torn about a goal may result in negative affect such as feelings of helplessness and disappointment, ultimately leading to increased symptoms of depression over time (Kelly, Mansell & Wood, 2011). Controlled reasons for action have been associated with decreased mental health outcomes such as anxiety, depression, and social dysfunction (Ryan, Rigby & King, 1993). Soenens, Berzonsky, Dunkel, Papini, and Vansteenkiste (2011) demonstrated a positive association between controlled regulation of adolescents' identity commitments and depressive symptoms, providing evidence to suggest that controlled goal motivation may be linked to symptoms of depression.

A limitation of a previous study that considered the role of goal motivation on the development of action crises is that these researchers computed a self-concordance index as opposed to considering the independent roles of autonomous and controlled forms of motivation (Hermann & Brandstätter, 2013). There are two important reasons why autonomous and controlled motivation should not be aggregated, they are not significantly related nor are their relations to goal outcomes mirror-image opposites (Judge et al., 2005; Koestner et al., 2008). Thus, while Hermann and Brandstätter (2013) examined the role of motivation previously, they did not consider autonomous and controlled motivation separately, or outside of the context of trait action orientation.

The Present Study

The present study aimed to shed light on the independent predictive effects of autonomous and controlled motivation as they relate to the development of action crises, beyond personality level constructs. Moreover we sought to elucidate the between- and within-individual relationships between motivation, dispositional variables and intensity of action crises. Previous research has found substantial variability in goal motivation and goal outcomes within individual participants (Werner, Milyavskaya, Foxen-Craft & Koestner, 2016). This suggests that beyond normative differences in self-regulatory capacity, the same individual may vary widely in his or her motivation for different goals, with some reflecting more autonomous and others more controlled reasons for action. While goal self-concordance has been suggested to nicely complement Kuhl and Fuhrman's (1998) theory of volition (see Sheldon & Elliot 1998, p.554), there is sparse evidence to support the notion that trait differences in action orientation (i.e. ability to self-regulate and reduce negative affect) are the main source of variability in self-concordant goal setting. Hermann and Brandstätter (2013, study 3) provided the first evidence that goal self-concordance partially mediates the relationship between trait level action orientation and action crises. Specifically, these researchers found that individuals high in action orientation displayed increased self-concordant goal setting. The present study seeks to build on Hermann and Brandstätter (2013) in five important ways: (1) assessing relevant personality trait predictors besides action orientation, (2) considering autonomous and controlled goal motivation separately, (3) examining the role of goal motivation in a multilevel framework, (4) investigating two different outcome measures to demonstrate the effect of action crises: goal progress and symptoms of depression, and (5) testing intended effort as a mechanism through which autonomous motivation may act as a protective factor for the emergence of action crises.

To examine the longitudinal impact of autonomous and controlled goal motivation on the development of action crises, goal progress, and symptoms of depression, we recruited university students who were pursuing three personal goals over the course of an academic semester. We hypothesized that autonomous and controlled motivation would have independent predictive effects for the development of action crises. Specifically, we expected autonomous motivation to represent a shielding factor for the development of mid-semester action crises, while we expected controlled motivation to represent a risk factor for developing more severe action crises in personal goal pursuit. Moreover, we hypothesized that the effects of goal motivation would predict significant variance in the severity of action crises beyond trait level action (vs. state) orientation and other important goal-related individual difference measures (i.e. conscientiousness, neuroticism and goal adjustment tendencies). Specifically, we predicted that high neuroticism would be a risk factor associated with more severe action crises, and that high conscientiousness would be a protective factor associated with less severe action crises. However, we did not hypothesize that trait level goal adjustment tendencies (disengagement and reengagement capacities) would predict between-person differences in action crisis susceptibility, as these traits are related to goal disengagement which occurs at a later temporal phase in the goal striving cycle (Heckhausen, Wrosch & Schulz, 2010).

To elaborate our understanding of the role of goal motivation in the development of action crises, we also sought to examine the effects of within-person differences in autonomous motivation. Specifically, we hypothesized that autonomous motivation would show shielding effects at the level of the person. In other words, we expected that individuals would tend to experience their least severe action crisis on their most autonomous goal compared to their other goals, controlling for their general tendency to set autonomous goals.

Finally, we wanted to test two mediation pathways to highlight the motivational antecedents and consequences of experiencing action crises in personal goal pursuit, as well as a third mediation to elucidate the negative relationship between autonomous goal motivation and action crisis severity. Firstly, we predicted that action crisis severity would mediate the well-established relationship between autonomous motivation and goal progress. Secondly, we predicted that action crisis severity would mediate the relationship between controlled motivation and symptoms of depression. Third, we sought to understand a possible mechanism through which autonomous motivation predicts less severe action crises. Specifically we wanted to test whether the intention to exert greater effort on a goal mediates the negative relationship between autonomous motivation and action crisis severity. We hypothesized that the intention to exert greater effort might act as a buffering factor for experiencing decisional conflict because it denotes a willingness to persevere in the face goal challenges, obstacles or distractions.

Methods

Participants and procedure

Four hundred and twenty five participants (76% females; 57.4% Caucasian, 32.2% Asian) ages 17-27 (M = 20.2, SD= 2.3) attending a large public Canadian university were recruited for a year-long study of personal goals. The questionnaires were administered through the survey software Qualtrics. The first survey (T1) was administered at the beginning of the academic year, and assessed participants' three personal goals, goal motivation, intended effort, subjective rating of goal feasibility, baseline well-being measures as well as personality inventories. Subsequent follow-up surveys assessed the degree to which participants experienced action crises for each of their three personal goals, goal progress, and symptoms of depression. A

total of six surveys were administered throughout the academic year, for the scope of this study we only considered the first three time points (beginning, middle and end of the fall semester). Two personality inventories were administered mid-second semester (T4) to reduce participant burden in earlier surveys. After receiving the link for the survey, participants had one week to complete the survey at a time of their choosing. The completion rate for each of the surveys was T2 = 97.6% and T3 = 91.5%. The study was conducted in compliance with the University Research and Ethics Board, and participants received financial compensation ($50 CAD) for their time.

Measures

Goal description. At T1 participants were asked to list three personal goals that they planned to pursue over the course of the academic year, using the instructions from Koestner et al. (2002). Examples of goals given to the students included "*I want to run my first half marathon this year*" and "*I want to get a 3.5 GPA*".

*Subjective goal feasibility***.** At T1 participants rated the subjective feasibility of each goal by answering one question about the goal's perceived difficulty ("How challenging do you think it will be to attain this goal?") and a question about the participant's perceived skills and resources ("To what extent do you feel you have the skills and resources necessary to attain this goal?"). All responses were made on a 7-point scale of 1 (*not at all*) to 7 (*extremely*).

Intended goal effort. At T1 participants rated their intention to exert effort for each goal by answering the question "How hard do you intend to try at this goal?" on a 7-point scale of 1 (not at all) to 7 (extremely). This item was adapted from Sheldon and Elliot (1999) which measured goal effort with a similarly worded item.

Autonomous and controlled goal motivation. Participants were asked to rate their motivation for pursuing each goal at T1 using five items that assessed external, introjected, identified, integrated, and intrinsic reasons for goal pursuit (Sheldon & Kasser, 1998). All responses were made on a 7-point scale of 1 (*not at all for this reason*) to 7 (*completely for this reason*). As in previous research, autonomous motivation was calculated as the mean of intrinsic, integrated, and identified ratings, whereas controlled motivation was calculated as the mean of external and introjected regulation (e.g. Koestner et al., 2008).

Action crisis. At T2 we administered the 6 item Action Crisis Scale (ACRISS) for each goal to measure action crisis severity (Brandstätter and Schüler, 2013). A native bilingual (German and English-speaking) Doctoral psychology student specializing in human motivation translated the original German version of ACRISS to make it easily understandable for a North American sample (as shown below). The ACRISS assesses post decisional goal conflict ("*Lately I feel torn between continuing to strive for this goal and abandoning it"*), setbacks ("*So far my goal pursuit has been smooth and unproblematic"*; reverse coded), implemental disorientation ("*I often feel stuck and am unsure of how to continue pursuing this goal"),* rumination ("I *often ruminate about my goal*"), disengagement impulses ("*I have thought about giving up this goal"*), and procrastination ("*I find myself not having worked on my goal, despite my intention of doing so"*). Participants rated the items on a 7-point scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Reliability was good with Cronbach α's ranging from .71 to .76 for the three goals. This is consistent with other research where the ACRISS has been found to have an α between .66 and .81 (Herrmann & Brandstätter, 2013).

Goal progress. Goal progress was assessed at each follow-up using three items for each goal, a measure that has been used in previous research assessing student goal progress (e.g.

Koestner et al., 2012): For example, “I have made a lot of progress toward this goal”. All ratings were made on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Reliability was excellent, α's ranging from .88 to .91 for the three goals.

*Action-Control scale***.** Action (vs. state) orientation was measured with an abbreviated 12 item Action-Control scale (ACS-24; Kuhl, 1994) at T4. Since action orientation is thought to represent an enduring individual difference, we did not expect the later assessment to affect our results. Each item describes a potentially stressful situation (e.g. “When I know I must finish something soon”) and has two answer options, one associated with action-orientation (e.g. “I find it easy to get it done and over with”) and one linked to state-orientation (e.g. “I have to push myself to get started”). The forced choice enables participants to answer the questions with their more likely response in the presented situations based on their implicit self-representation (Kuhl, 1994). The two subscales respectively assess failure (AOF) and decision-related (AOD) action orientation; we used six items for each. The scores were computed by adding the action-oriented answers for possible totals between 0 and 6. Our abbreviated items yielded an AOD α =.61 and an AOF α = .63. These internal consistency coefficients are lower than those typically observed with the full ACS, which has been found to have α's between .69 and .84 (Herrmann & Brandstätter, 2013). However, we consider the α's acceptable given the reduced number of items.

*Big-Five Inventory***.** To measure the personality constructs of conscientiousness and neuroticism we administered the 44-item Big-Five Inventory (BFI) (John & Srivastava, 1999) which is a widely-used, reliable and valid measure of the Big Five. The BFI utilizes 44 short phrases based in the trait adjectives known to be prototypical of the Big Five to capture individual differences. Participants rated phrases such as “I am someone who worries a lot” (neuroticism) and “I am someone who tends to be disorganized” (conscientiousness, reversed) on

a 5-point Likert scale ranging from strongly disagree to strongly agree.

Goal Adjustment Tendencies. Goal disengagement and goal reengagement tendencies were assessed with the Goal Adjustment Capacity scale (Wrosch et al., 2003) at T4. Participants responded to 10 items measuring how they usually react if they have to stop pursuing an important goal (5-point Likert-type scales anchored at 1 = almost never true, 5 = almost always true). Four items measured a person's tendency to disengage from unattainable goals (e.g. *"It's easy for me to reduce my effort towards the goal*") and six items measured a person's tendency to reengage with new goals (e.g. "*I seek other meaningful goals").*

Symptoms of Depression. We used the Centre for Epidemiologic Studies Depression Scale Revised (CESD-R 10; Björgvinsson et al., 2013) to assess symptoms of depression at T1 and T3. The CESD-R 10 is a validated self-report measure of depression symptoms that focuses on the affectivity component of depressed mood (Björgvinsson et al., 2013). The scale includes ten items such as "*I could not get going*" and "*I was bothered by things that usually don't bother me*", and is measured on a four-point Likert scale ranging from "rarely or none of the time (<1 day)" to "most or all the time (5-7 days)". The depression symptoms score was computed by adding the ten items.

Results

Analytic Strategy

Correlations and hierarchical regressions were assessed with the IBM® SPSS® Statistics software (version 22). Mediation analyses were performed with the PROCESS macro for SPSS®. (Hayes, 2012), a computational tool that uses a bootstrapping procedure to test for indirect effects. Because each person named three goals, we conducted multilevel analyses with goals

nested within person. The MIXED procedure in SPSS was used with goals nested within participants.

Preliminary Results

Data screening found the variables of interest to be normally distributed making the variables suitable for regression analyses. Table 1 illustrates the descriptive statistics for and correlations between all of key variables of this study. Overall, participants reported significantly higher autonomous motivation across their three goals (M = 5.26, SD = 0.89) compared to controlled motivation (M = 3.18, SD = 1.12), $t(424) = 28.26$, $p < 0.001$. As expected, participants made more progress on their three goals as the semester progressed, with less progress at T2 (M = 3.34, SD = 1.01) than at T3 (M = 3.98, SD = 1.05), $t(387) = -3.08$, $p < 0.01$. Participants' symptoms of depression also increased as the semester progressed with less symptoms at baseline (M = 10.113, SD = 4.86) than at the end of the semester (M = 12.25, SD = 5.66), $t(382) = -7.28$, $p < 0.001$. The table illustrates that participants' mean autonomous motivation at the beginning of the semester was negatively associated with mid-semester action crisis severity $r(413) = -0.22$, $p < 0.01$, and positively associated with participants' goal progress at both mid-semester, $r(413) = 0.20$, $p < 0.01$, and end-of-semester, $r(388) = 0.14$, $p < 0.01$.

Conversely, participants' mean level of controlled motivation at the beginning of the semester was positively associated with levels of mid-semester action crisis severity, $r(413) = 0.30$, $p < 0.01$. Consistent with previous research, controlled goal motivation was not significantly associated with goal progress (Koestner et al., 2008). However, controlled goal motivation was positively associated with symptoms of depression at the end of the semester (controlling for baseline depression) $r(380) = 0.13$, $p < 0.01$.

Main analyses

To examine how personality traits and goal motivation influenced the severity of average mid-semester action crises across three personal goals, we performed a three-step hierarchical regression. In the first step of the regression, we entered participants' two subscales of action-orientation to replicate Herrmann & Brandstätter (2013), in the second step we entered all novel personality traits that have been proposed as relevant candidates in the prediction of action crises (conscientiousness, neuroticism, goal disengagement and reengagement capacity), and finally, in the third step we entered participants' average autonomous and controlled goal motivation across three goals. At the first step of the regression, participants' failure related action-orientation (β = -.14, t = -2.88, $p < 0.05$) and decision related action-orientation (β = -.23, t =-4.53, $p < 0.01$) were both negatively associated with mid-semester action crisis severity, replicating Hermann and Brandstätter (2013). Together, the two subscales explained 8.6% of the variance (F(2,387) = 18.20, $p < 0.001$). At the second step of the regression, conscientiousness was also negatively associated with action crisis severity (β = -.20, t = -3.72, $p < 0.01$), while neuroticism was positively associated with action crisis severity (β = .26, t = 4.81, $p < 0.01$). Both goal disengagement and reengagement capacity did not significantly contribute variance at the second step of the regression. Together the second step of the regression explained an additional 9.3 % of the variance (F(4,383) = 10.88, $p < 0.001$). Finally, at the third step of the regression, autonomous and controlled motivation both significantly predicted an additional 4.8 % of the variance of mid-semester action crisis severity, beyond all relevant personality traits (F(2,381) = 11.71, $p < 0.001$). Autonomous motivation was negatively associated with action crisis severity (β = -.12, t = -2.53, p = 0.012), whereas controlled motivation was positively associated with action crisis severity (β = .19, t = 3.92, $p < 0.01$). In total, this model accounted for 21.1% of the variance associated with mid-semester action crisis severity. Importantly the independent effects

of autonomous and controlled motivation on action crisis severity remained significant after controlling for the influence of the trait action-orientation, conscientiousness and neuroticism.

Multilevel modeling analyses.

Having obtained evidence for the significant role of goal motivation in the development of action crises, we next sought to assess the within-person effects of motivation for predicting action crisis severity. According to Maas and Hox (2005), our sample was more than adequate to meet the requirements for power (these researchers recommend 50 or more level-2 units (participants) for an unbiased estimation of the level-1 and level-2 variables in MLM).

First, using MLM, we estimated the proportion of within-person variance to the proportion of between-person variance in participants' experience of mid-semester action crises. The intra-class correlation coefficient (ICC) indicated that 12.9% of the total variance in action crises was accounted for by differences at the between-person level, while 87.1% of the total variance was accounted for by differences at the within-person level (between goals). We also established the proportion of variance in participants' autonomous goal motivation. The ICC indicated that 18.3% of the total variance in autonomous goal motivation was accounted for by differences between people, while 81.7% of the total variance was accounted for by differences in autonomous motivation between goals (within people). Meanwhile, the ICC for controlled motivation was a little higher, indicating that 25.6% of the variance of controlled goal motivation was accounted for by differences between people.

Next, we examined our hypothesis that goal-specific autonomous motivation would predict the extent of action crisis experienced on that goal. In order to examine the effects of autonomous motivation for each goal relative to a person's other goals, we person-mean centered goal autonomous motivation (Nezlek, 2012) so that the value of each goal reflected the

difference between that goal and the person's average autonomous motivation across goals. We entered person-centered autonomous goal motivation as a fixed predictor in the random-intercept-and-slope two-level mixed model with T2 action crises as the dependent variable in the model[2]. In order to contrast goal-specific autonomous motivation with trait level conscientiousness, neuroticism, and participant's average tendency to set autonomous goals on the development of mid-semester action crises, we also entered these three variables as fixed predictors in the model. Person-centered autonomous goal motivation was negatively related to mid-semester action crises on that specific goal (b = -.16, SE = 0.04, t = -4.59, $p < 0.001$, *95% CI* = -.23, - .09). That is, people were less likely to experience a mid-semester action crisis for a more autonomous goal compared to their less autonomous goals. Results for mean autonomous motivation on action crises indicated that participants' general tendency to set autonomous goals was negatively related to action crisis severity (b = -.12, SE = 0.04, t = -3.08, $p < 0.01$, *95% CI* = -.20, -.04). Similarly, results for conscientiousness revealed that this personality trait was negatively related to action crisis severity (b = -.21, SE = 0.05, t = -4.11, $p < 0.001$, *95% CI* = -.32, -.11). Finally, results for neuroticism revealed that this trait was positively related to mid-semester action crisis severity (b = .27, SE = 0.04, t = 6.12, $p < 0.001$, *95% CI* = .18, .35). Thus, both within- and between-person differences in autonomous goal setting, as well as differences in conscientiousness and neuroticism significantly contributed to the variance in predicting participants' action crisis severity. Within-person differences in controlled motivation did not predict action crisis severity (b = .05, SE = 0.03, t = 1.64, p =.10, *95% CI* = -.01, .11).

Mediation analyses.

[2] We also tested the random intercept model but it yielded a slightly poorer fit as evaluated by the AIC.

After establishing that autonomous goal motivation was negatively related to action crisis severity, making it a protective factor against experiencing action crises, we sought to examine how autonomous motivation and action crisis severity affected goal progress at the end of the semester. Specifically, we hypothesized that T2 action crisis severity mediated the relationship between T1 autonomous motivation and T3 goal progress. We used the method outlined by Hayes (2012) to test this mediation model by estimating 95% confidence intervals (CI) of the indirect effect using bootstrap resampling (k = 10000) procedures. The betas in the following mediation analyses reflect the standardized coefficients. In this mediation, we controlled for baseline subjective goal feasibility. Results from the mediation analysis showed that mean autonomous motivation was a significant predictor of mid-semester action crisis severity, b = -.22 (*SE* = 0.05, t = - 4.43, $p < 0.001$, *CI* = - .32, -.12). Mid-semester action crisis severity was a significant predictor of T3 goal progress, b = -.38 (*SE* = 0.05, t = -8.18, $p < 0.001$, *CI* = - .48, -.30), such that less severe action crises were associated with greater goal progress. Next, we examined the total, indirect, and direct effects. The total effect of autonomous *p* motivation on end-semester goal progress was significant at b = .15 (*SE* = 0.05, t = 2.76, $p < 0.05$, *CI* = .04, .25). This is considered significant, as the confidence interval does not straddle zero (Hayes, 2012). The indirect effect of T1 autonomous motivation on T3 goal progress through mid-semester action crisis severity was estimated to be (unstandardized) b = 0.10 (*SE* = .03, CI = .05, .16), while the direct effect of autonomous motivation on goal progress over-time was no longer significant b = .05 (*SE* = 0.06, t = 1.16, p = 0.25; *CI* = -.04, .16), suggesting full mediation. Together, these results support the hypothesis that action crisis severity mediates the relationship between autonomous goal motivation and goal progress over time (see Figure 1).

Next we sought to examine the relationship between T1 mean controlled goal motivation, T2 action crisis severity and T3 symptoms of depression. We hypothesized that T2 action crisis severity mediated the association between controlled motivation at the beginning of the semester and symptoms of depression at the end of the semester. Thus, we performed a second mediation analysis using the same bootstrap resampling procedures. To control for the effects of baseline depression symptoms on our outcome variable, we entered T1 depression symptoms as a covariate in the model. Results from the mediation analysis showed that mean controlled motivation was a significant predictor of T2 action crisis severity, b = .29 (*SE* = 0.05, t = 5.99, p < 0.001; *95% CI* = .20, .40), and that T2 action crisis severity was a significant predictor of T3 symptoms of depression, b = .20 (*SE* = 0.05, t = 4.04, p < 0.001; *95% CI* = .10, .29). The total effect of controlled motivation on T3 symptoms of depression was significant at b = .13 (*SE* = 0.05, t = 2.63 p < 0.01, *95% CI*= .03, .23). The indirect effect of controlled motivation on depression symptoms through action crisis severity was (unstandardized) b =.30 (*SE* = 0.09, *95% CI* =.14, .52). Finally, the direct effect of controlled motivation on symptoms of depression was reduced to b = .49 (*SE* = .25, t =1.94, p = 0.05; *95 % CI*= -.01, .98) in the mediation analysis, suggesting full mediation. Together, these results support our hypothesis that mid-semester action crisis severity mediates the relationship between controlled motivation and symptoms of depression (see Figure 2).

Finally, we sought to test intended goal effort as a mechanism through which autonomous motivation may lead to decreased action crisis severity. In this mediation, we controlled for baseline subjective goal feasibility. Results from the mediation analysis showed that mean autonomous motivation was a positive predictor of intended effort, b = .45 (*SE* = .04, t = 10.59, p < 0.001, *95 % CI* = .37, .54), and that intended effort negatively predicted the severity of mid-

semester action crises, b = -.32 (SE = .06, t = -5.78, p < 0.001, *95 % CI* = -.43, -.21). The total effect of autonomous motivation on action crisis severity was significant at b = -.22 (SE = .05, t = -4.34, p < 0.01, *95% CI* = -.32, -.12). The indirect effect of autonomous motivation on action crisis severity through intended effort was estimated to be b (unstandardized) = -.12 (SE = .02; *95% CI* = -.17, -.07), while the direct effect of autonomous motivation on action crisis severity was no longer significant b = -.09 (SE = .05, t = -1.88, p = 0.06, *95% CI* = -.20, .004), suggesting full mediation. Together, these results support the hypothesis that intended goal effort acts as a mediator between autonomous goal motivation and action crisis severity (see Figure 3).

Discussion

The primary objective of the present study was to examine the independent predictive roles of autonomous and controlled motivation in the development of action crises, thereby elaborating on Hermann and Brandstätter's (2013) discovery of the negative relationship between goal self-concordance and action crises. While previous research has highlighted the importance of trait level action orientation in predicting the severity and resolution of action crises, this research considered the state level predictor of motivation at both the within- and between person levels. The finding that action crises are determined, in part, by autonomous and controlled goal motivation has important implications for research interventions that aim to prevent these states of inertia and internal conflict. While it may prove difficult or impossible to intervene at a trait level, future interventions targeted at internalizing goal motivation may be a fruitful way to protect individuals from experiencing action crisis in personal goal pursuit.

Our results indicate that autonomous motivation for personal goals represents an independent protective factor that shields people from developing severe action crises in personal goal pursuit. In other words, those individuals who tended to set more autonomous goals at the

beginning of the semester experienced less severe action crises, on average, than individuals who tended to set less autonomous goals. This is consistent with Herrmann and Brandstätter's (2013, Study 3) finding that goal self-concordance was negatively associated with experiencing an action crisis. Results from our study also showed the benefits of autonomous motivation accrued at the within- person level of analysis. MLM revealed that individuals were less likely to experience a severe action crisis on their most autonomous goal, relative to their other goals. Consistent with previous research (Werner et al., 2016), our within-person analyses revealed 81.7% variability in autonomous goal motivation, and 87.1% within-person variability in action crises. This suggests the same individual generally tends to pursue different goals for very different reasons, and that the extent to which he or she encounters an action crisis varies widely from goal to goal. These findings lend support to our rationale of looking beyond enduring individual difference measures in predicting people's susceptibility to the experience of action crises in personal goal pursuit.

There are several reasons why we suspect autonomous motivation shows a protective effect of shielding people from experiencing action crises. Firstly, autonomous goals are more internalized, and are thus likely to reflect a person's core values, interests and desires (Ryan, 1995). This enmeshment of autonomous goals with a person's self-concept and sense of identity might make these goals more resilient to difficulties and setbacks. Autonomous goals are also more likely to provide consistent energization (Gollwitzer, 1990) and decreased attraction to goal-disruptive temptations (Milyavskaya, Inzlicht, Hope & Koestner, 2015), making decisional conflicts less likely to set in. We explicitly tested the mechanism of intended effort in a mediation model, finding that autonomous motivation was positively associated with the intention to exert greater effort on the goal, which was in turn negatively associated with mid-

semester action crisis severity. The intention to exert greater effort on a goal fully mediated the relationship between autonomous motivation and action crisis severity. This intention associated with autonomous goal pursuit may indicate a psychological readiness to commit resources to a goal, withstand goal-related challenges, and suppress urges that may lead to a decisional conflict, such as indulging temptations or distractions. Another possible explanation for this effect that we did not test here may be that autonomous goals are perceived as easier to pursue relative to other goals (Werner et al., 2016). Using multilevel structural equation modelling, Werner et al. (2016) demonstrated that subjective ease mediated the relation between motivation and goal progress, such that people were more likely to successfully accomplish self-concordant goals because pursuing those goals was perceived as being more effortless.

Our results also suggest that controlled motivation represented an independent risk factor for developing mid-semester action crises, after controlling for the personality traits of action orientation, neuroticism, conscientiousness, and goal adjustment capacity. Controlled goals, by their definition, represent a conflict between external demands or internal pressures and inherent psychological needs and growth tendencies (Ryan, 1995). The partial or incomplete integration of controlled goals seem to make them especially susceptible to obstacles and temptations when setbacks and difficulties in the goal striving process occur (Milyavskaya et al., 2015). Interestingly, while controlled motivation represented a predictive factor for action crisis severity at the between person level, within-person differences in controlled goal motivation did not contribute to the predictive variance of action crises. Although future research is needed to understand this finding, we can speculate that controlled motivation operates in a more inconsistent fashion than autonomous motivation, because it is largely governed by external

contingencies determined by the environment rather than stable internal characteristics of the individual (e.g. values).

Although our study's primary focus was to investigate the independent predictive effects of autonomous and controlled motivation in explaining action crisis severity, another novel contribution of our study was establishing the roles of conscientiousness and neuroticism in determining people's susceptibility to action crises. Indeed, conscientiousness was associated with experiencing less severe mid-semester action crises, while neuroticism was associated with experiencing more severe action crises, beyond action orientation. These findings are not surprising, given that conscientiousness has been associated with industriousness and self-control (Roberts et al, 2005), and advanced academic and workplace performance (Higgins, Peterson, Pihl, & Lee, 2007). The finding that neuroticism was linked to more severe action crises is also consistent with previous research. For example, neuroticism has been associated with enhanced rumination and worry (Muris, Roelofs, Rassin, Franken & Mayer, 2005), which are defining features of an action crisis (Brandstätter & Schüler, 2013). As predicted, we did not find an association of goal adjustment capacity with action crises severity, suggesting that people's ability to disengage from unattainable goals and reengage with new goals is not a relevant predictor of action crisis severity.

The current study also considered some consequences associated with the experience of action crisis in goal pursuit. Specifically, we tested two mediation pathways associated with the independent effects of autonomous and controlled goal motivation. Our first mediation model examined the role of action crises in explaining the relationship between baseline autonomous motivation and end-of-semester goal progress. Averaging across participants' three goals, we found that mid-semester action crisis severity fully mediated the relationship between

autonomous motivation and goal progress over the course of a semester. This result replicates Sheldon and Elliott's (1998) well-established finding that increased autonomous motivation predicts enhanced goal progress over time, but sheds light on a novel mechanism, action crises, to explain the facilitative effects of autonomous motivation on goal progress.

In a second mediation model, we found support for action crisis severity mediating the relationship between controlled motivation for goals at the beginning of the semester and depressive symptoms at the end of the semester. Controlled motivation has been notorious in showing weak or variable effects on goal progress (Koestner et al., 2008), but in the present study we considered the role of controlled motivation and ill-being. Previous research provides some preliminary support for the association between controlled motivation and ill-being (Ryan, Rigby & King, 1993). For example, in a study of athlete burnout Jowett, Hill, Hall, and Curran (2013) found that controlled motivation for sport was positively associated with athlete burnout characterized as "perceived emotional and physical exhaustion" (p.3). Although previous research has linked action crises with decreased life satisfaction and low positive affect, this is the first study to consider the association between action crises and symptoms of depression. The present investigation also has important implications for self-concordance research. While SDT researchers have been in agreement about the positive impact of autonomous motivation on well-being and goal progress, the negative sequelae of controlled motivation in goal pursuit have remained somewhat nebulous (e.g. Koestner et al., 2008). As such, this finding proposes a novel pathway through which controlled goal motivation promotes poor adjustment outcomes, such as increased symptoms of depression.

Despite the contribution of the present research to the understanding of the development of action crises, it is important to underscore some limitations. In the present study we focused

on emerging adults attending university, but the role of motivation in action crises should be replicated in populations of different cultures and should consider individuals experiencing action crises at different life-stages. Indeed, the study was conducted on sample of predominantly female students at a Canadian University. However, much of the existing action crisis research has been conducted with central European participants (e.g. Herrmann & Brandstätter, 2013), so we are extending this research by examining a North American sample (57% Caucasian, 32% Asian). Since the present study used a prospective longitudinal design it precludes firm conclusions about causality. Future studies are also needed to hone our understanding of the processes and dynamics that can play a role in the associations between goal motivation and action crises. It is unclear whether there are qualitative differences in the action crises experienced for autonomous goals and controlled goals, and whether these action crises are resolved in a similar manner. Indeed, this study did not assess whether participants' action crises were resolved through perseverance or resulted in goal disengagement. Since autonomous goals represent a person's values and enduring interests, one could hypothesize that experiencing a decisional conflict about an autonomous goal might come at a greater emotional cost than re-evaluating an instrumental, controlled goal that is further removed from one's sense of authentic self and identity. However, one could also make the reverse argument that sense of choice and volition associated with autonomous goal pursuit might give rise to a more flexible approach when goal pursuit becomes problematic, facilitating a timely resolution of action crises without taking a toll on health and well-being. Future research could also explore whether the two regulatory styles for goal pursuit are associated with different action crisis triggers. For example, perhaps autonomous goals are more susceptible to an action crisis triggered by an emergent goal alternative that captivates curiosity and interest (re-directing volitional resources),

whereas controlled goals may be more susceptible to action crises when the goal pursuit becomes difficult or problematic.

Future research is also warranted to consider contextual factors, such as goal support, that may moderate the relationship between goal motivation and the development of action crises. SDT suggests that autonomy support (i.e. taking another's perspective, acknowledging feelings, and encouraging self-initiation) facilitates the internalization of autonomous self-regulation and associated behaviour change. Perceived autonomy support has been repeatedly associated with greater internalized motivation, goal persistence, and goal progress (Koestner et al., 2015; Powers & Koestner, 2007). As such, one could hypothesize that the provision of autonomy support may shield participants from action crises both directly and indirectly by (a) providing the validating, growth-oriented support that may help individuals resolve an action crisis and (b) helping individuals internalize their goal motivation. Thus, future research might benefit from considering the social context of action crises as they arise in personal goal pursuit.

In sum, this study explored the motivational antecedents and consequences of experiencing action crises in personal goal pursuit. Our findings introduce autonomous and controlled motivation as independent predictors of action crisis severity, beyond known personality level predictors (action orientation), and novel personality level predictors (neuroticism and conscientiousness). The results from this study suggest that autonomous motivation operates as an independent shielding factor for action crises, while controlled motivation may represent an independent risk factor for developing action crises in personal goal pursuit. Furthermore, MLM analyses revealed that autonomous motivation is a significant predictor of action crisis severity at both the within- and between-person levels of analysis, controlling for neuroticism and conscientiousness. Finally, we found that action crisis severity

mediates both the relationship between autonomous motivation and goal progress, and the relationship between controlled motivation and symptoms of depression. We also tested intended effort as a mechanism to explain the negative relationship between autonomous motivation and action crisis severity. Together, this research enhances our understanding of the motivational and personality factors that can impact the development of action crises. In turn, this research examines how action crises affect goal progress and symptoms of depression.

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Tables and Figures Article 1

Table 1

Descriptive Statistics for and Correlations Between the Major Study Variables

	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.T1 autonomous motivation for disengagement	5.26 (.89)													
2. T1 controlled motivation for disengagement	3.18 (1.12)	.-.13**												
3. Failure-related action orientation	2.25 (1.67)	.05	-.14**											
4. Decision-related action orientation	2.80 (1.71)	13**	-.16**	.23**										
5. Neuroticism	3.16 (0.82)	-.13**	.24**	-.48**	-.27**									
6. Conscientiousness	3.55 (0.69)	.22**	-.21**	.00	.42**	-.18**								
7. Goal disengagement capacity	11.41 (3.24)	-.18**	.01	.22**	.00	-.15**	-.06							
8. Goal reengagement capacity	22.07 (3.80)	.11**	.01	.17**	.23**	-.20**	.20**	.33**						
9. T2 mean action crisis severity	3.70 (.76)	-.22**	.30**	-.20**	-.26**	.33**	-.27**	-.02	-.07					
10. T3 goal progress	3.98 (1.05)	.14**	.00	.06	.24**	-.15**	.22**	-.06	.05	-.40**				
11. T1 depression symptoms	10.13 (4.87)	-.15**	.37**	-.26**	-.33**	.52**	-.29**	-.07	-.15**	.37**	-.16**			
12. T 3depression symptoms	12.25 (5.66)	-.08	.28**	-.27**	-.23**	.44**	-.22**	-.10	-.12**	.35**	-.28**	.44**		
13. Subjective goal feasibility	5.42 (0.59)	.32**	.06	-.01	.04	-.06	.14**	-.03	.13*	-.06	.02	-.11*	.02	
14. Intended effort	5.71 (0.73)	.46**	-.12	-.00	.21**	-.08	.30**	-.09	.13**	-.33**	.19**	-.19**	-.07	.41**

Note: ** = $p < 0.01$; * = $p < 0.05$

Figure 1

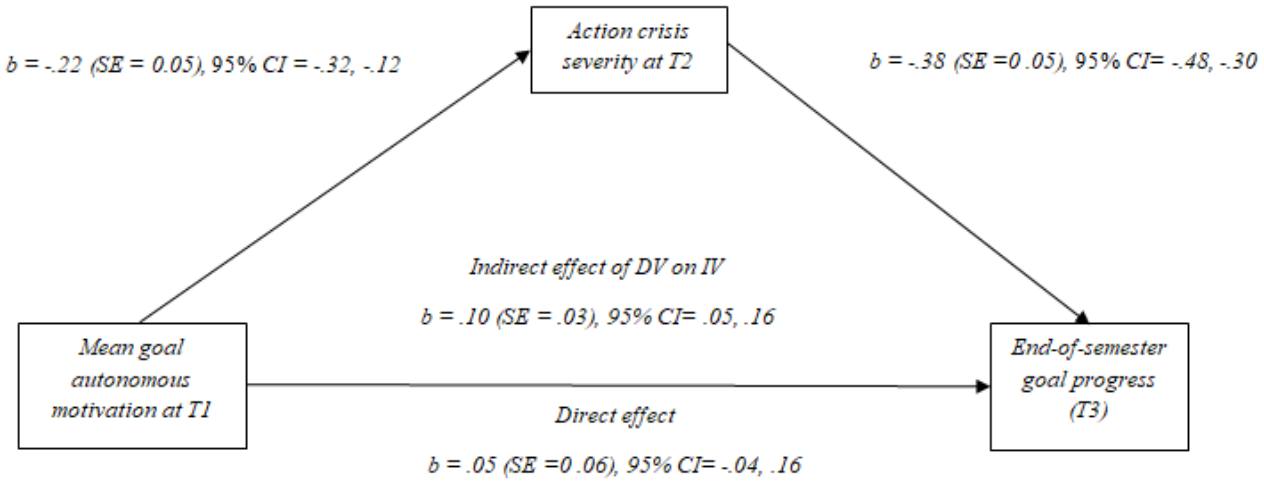

Figure 1. Direct and indirect effects of autonomous goal motivation on participants' end-of-semester goal progress, controlling for subjective goal feasibility. Total effect of DV on IV: b = .15 (SE =0 .05 t=2.76, p <0 .05, 95% CI = .04, .25).

Figure 2

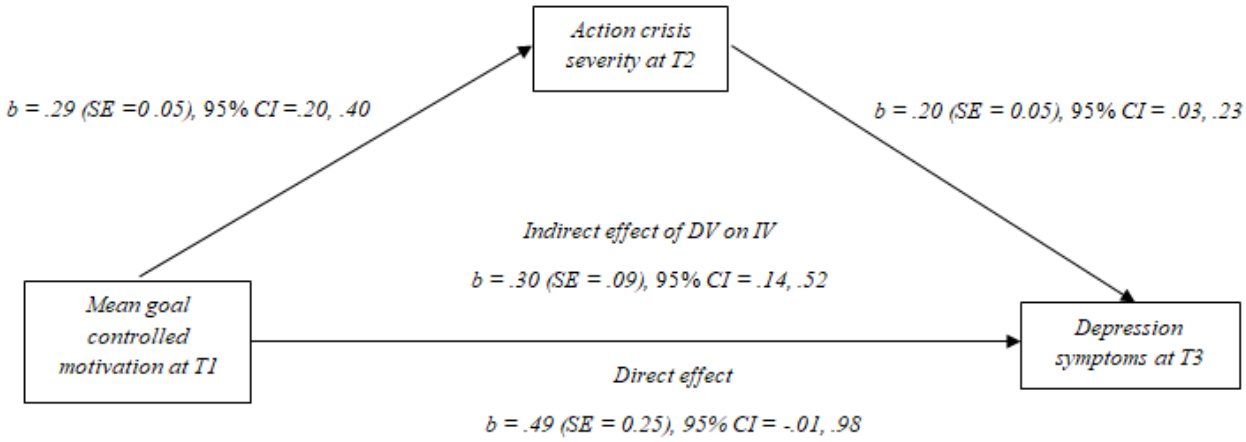

Figure 2. Direct and indirect effects of controlled goal motivation on participants' symptoms of depression, controlling for baseline symptoms of depression. Total effect of DV on IV: b = .13 (SE =0.05, t = 2.63, p < 0.01, 95% CI = .03, .23).

Figure 3

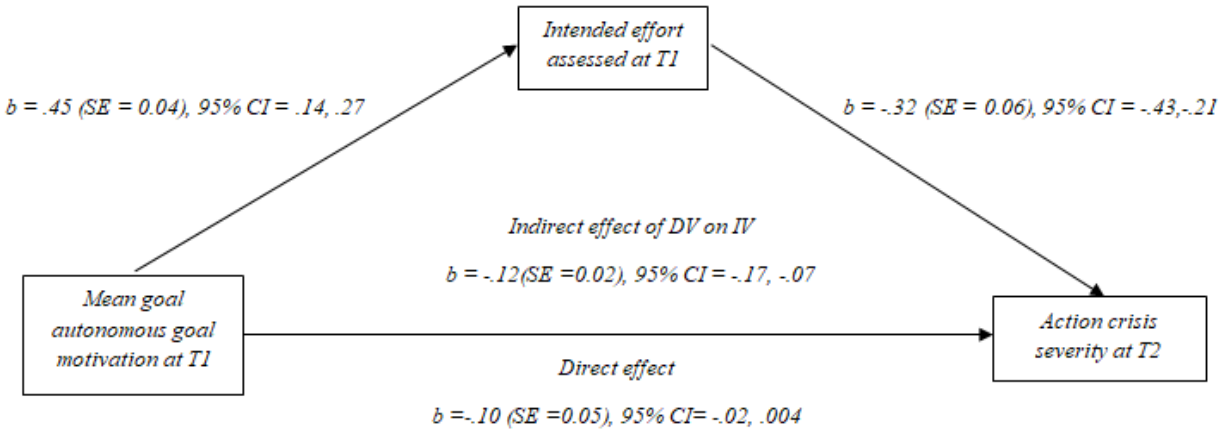

Figure 3. Direct and indirect effects of autonomous motivation on mid-semester action crises, controlling for subjective goal feasibility. Total effect of DV on IV: b = -.22 (SE = 0.05, t= -4.34, p < 0.01, 95% CI = -.32 -.12).

Bridge to Article 2

Article 1 examined the antecedents and consequences of experiencing action crises in goal pursuit. Our results indicated that individuals who experienced greater autonomous motivation for their personal goals experienced less severe action crises during goal pursuit. The relative absence of action crises appeared to mediate the positive relation between autonomous motives and goal progress. Thus, Article 1 identified a new pathway through which autonomous motivation leads to enhanced goal progress. We also found that controlled motives for personal goals were associated with more severe action crises, which were associated with increases in depressive symptoms over the course of the academic semester.

Building on this finding, we sought to further investigate the consequences of action crises and controlled goal striving in Article 2. Specifically, we sought to examine the effects of controlled and conflicted striving on changes in an endocrinological marker of chronic stress (hair cortisol), perceived stress, symptoms of poor health, and symptoms of depression in the context of an 8-month longitudinal study.

With the aim of replicating the results obtained in Article 1 in a longer timeframe, we hypothesized that: (a) controlled motivation would be positively associated with more severe action crises during goal pursuit, and (b) experiencing more severe action crises would be positively related to changes in individuals' levels of stress (both physiological and subjective), their health symptoms, and symptoms of depression. Building on the links between controlled motivation, action crises and increases in depressive symptoms obtained in Article 1, we sought to establish the psychological and physiological costs of controlled and conflicted goal striving on a range of markers of stress and ill-being.

Article 2

When goal pursuit gets hairy: A longitudinal goal study examining the role of controlled motivation and action crises in predicting changes in hair cortisol, perceived stress, health and depression symptoms.

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Abstract Article 2

The action crisis is a phase in goal striving during which the pursuer feels conflicted about persevering with the goal or initiating disengagement. Recent research suggests that pursuing a goal for controlled reasons, (i.e., due to internal or external pressure), increases the likelihood of experiencing action crisis. The present study examined whether the pursuit of controlled goals, as well as the experience of action crises, is associated with increasing levels of hair cortisol, perceived stress, poor health symptomatology, and symptoms of depression. We conducted an 8-month longitudinal study (N=156), tracking university students' pursuit of personal goals. Markers of stress and ill-being were assessed at the beginning and end of the academic year. Results from a structural equation model indicated that action crises in goal pursuit were associated with increased markers of stress and ill-being, which were partially explained by controlled goal motivation. The clinical and theoretical implications of these findings are discussed.

Key words: controlled motivation, action crisis, hair cortisol, stress, symptoms of depression

When goal pursuit gets hairy: A longitudinal goal study examining the role of controlled motivation and action crises in predicting changes in hair cortisol, perceived stress, health and depression symptoms.

The idiom of something "getting hairy" refers to a situation getting rough, difficult, frightening or complicated. Applied to goal pursuit, “getting hairy” could be one way to describe the experience of having an *action crisis*. An action crisis occurs when the pursuit of a goal is mired in setbacks, obstacles and difficulties, and one enters a prolonged state of decisional conflict, feeling torn between persevering with the goal and letting it go (Brandstätter, Herrmann, & Schüler, 2013). Preliminary research suggests that action crises are associated with increases in cortisol (Brandstätter, et al., 2013, Study 3) and worsening symptoms of depression (Holding et al., 2017), highlighting the clinical relevance of investigating this phase in goal striving. In addition, recent research suggests that the pursuit of controlled goals, (i.e., the pursuit of goals out of feelings of internal or external pressure), makes individuals more vulnerable to the experience of action crisis during goal pursuit (Holding, Hope, Harvy, Marion-Jetten & Koestner, 2017). However, little is known about the long-term impact of controlled goal pursuit and action crises for stress, physical and mental health. To this end, we studied goal pursuit “getting hairy” in the second, literal sense of the phrase: we sampled participants’ hair to measure the chronic secretion of the stress hormone cortisol as they pursued three personal goals over the span of 8 months. Unlike measuring cortisol using saliva or blood, the collection of hair for cortisol assessment allows researchers to capture systemic differences in cortisol secretion over the last three months and is less affected by time-varying confounders than other biospecimens (Russell, Koren, Rieder, & Van Uum, 2012). Cortisol is a hormonal product of the

reactivity of the limbic-hypothalamic-pituitary-adrenal axis that signals the activation of a stress-induced coping process (Dickerson & Kemeny, 2004). While the physiological changes brought about by a stress response help the body to maintain homeostasis in the face of a stressor, sustained responses or repeated reactivations are hypothesized to wear and tear the stress system, with detrimental consequence for health (Staufenbiel et al., 2013).

To date, hair cortisol has not been employed in goal research, let alone in a longitudinal design. Our aim was thus to examine how controlled motives and the experience of action crises during goal pursuit impacted changes in hair cortisol, as well as perceived stress, health symptoms and symptoms of depression.

The pursuit of personal goals lends structure, meaning and purpose to peoples' lives and is a vital source of positive affect and life satisfaction (Deci & Ryan, 2017). However, when the "goaling gets tough" and pursuit becomes overly costly and demanding, holding on to a blocked goal can have negative consequences for mental and physical health (Wrosch, Scheier & Miller, 2013). While goal disengagement in this context is adaptive, allowing the pursuer to both conserve motivational resources and avoid repeated experiences of failure, research shows that individuals are reluctant to part with goals, even after they have proved futile or have lost their appeal (Sleesman, Conlon, McNamara, & Miles, 2012). Instead, the disheartened pursuer is likely to enter a phase of action crisis in which he or she feels deeply conflicted about persevering with the troublesome goal or cutting losses and initiating goal disengagement (Brandstätter et al., 2013).

Due to the uncertainty and conflict associated with action crises, this phase in goal striving is experienced as highly unpleasant, and associated with decreased life satisfaction and reduced positive affect (Brandstätter et al., 2013), as well as increased symptoms of depression

(Holding et al., 2017). Moreover, action crises in goal striving have been associated with physiological consequences including somatic symptoms (e.g., headaches; Brandstätter et al., 2013), poorer physical performance (e.g., marathon finishing time; Brandstätter et al., 2013), as well as markers of increased physiological stress during short-term performance contexts, such as steeper salivary cortisol slopes in runners (Brandstätter et al., 2013) and increased blood cortisol in cyclists (Venhorst, Micklericht & Noakes, 2018). Together, these findings suggest that being in a prolonged or severe action crisis may compromise well-being and physical health.

However, this previous research has typically only considered the short-term consequences of action crises. For example, the effects of action crises on cortisol have been studied over the course of a marathon race (Brandstätter et al., 2013, Study 3), and in small populations (e.g., N = 23; Venhorst, Micklericht & Noakes, 2018). This is likely because cortisol biospecimens such as saliva and blood are resource intensive to collect, and are best suited to directly measure the response to acute stressors (Russell, Koren, Rieder & Van Uum, 2012). Thus, while collecting saliva or blood cortisol samples can be advantageous for assessing experimentally induced or naturally observed acute stress, these biospecimens are not ideally suited for tracking change in persistent differences of cortisol secretion over time (Russell et al., 2012). Since action crises during goal pursuit are thought to unfold over the course of several weeks and months (Brandstätter et al., 2013), the prospective and repeated collection of hair samples for cortisol measurement may more closely signal the changes in cortisol levels that the brain is exposed to over an extended period of time as compared to biospecimens that capture acute cortisol secretion (Kirschbaum et al., 2009).

Additionally, we considered whether controlled motivation for a goal, which is a motivational antecedent of the action crisis (Holding et al., 2017), also relates to changes in

markers of stress and ill-being over time. According to Self-Determination Theory (SDT; Ryan & Deci, 2017), a macro theory of human motivation, controlled motivation for goals is characterized by a sense of internal or external pressure to act, which often alienates the person from their own priorities and values. Thus, even when controlled goals are self-generated, they may not feel truly "personal" because they are chosen due to external incentives, such as obtaining rewards or pleasing others (*external regulation*), or due to internal pressures, such as reducing feelings of guilt and shame (*introjection*) (Sheldon & Elliott, 1998). Both external regulation and introjection are considered controlled forms of motivation (Ryan & Deci, 2017). While controlled motives for pursuing goals tend not to predict goal performance outcomes such as sustained effort, goal progress, or attainment (Sheldon et al., 1998; Koestner et al., 2008), they have recently been shown to predict the occurrence of more severe action crises during goal pursuit (Holding et al., 2017). A likely explanation is that controlled goals are less representative of enduring interests and values (Ryan & Deci, 2017) and more susceptible to competing desires and temptations (Milyavskaya, Inzlicht, Hope, & Koestner, 2015).

As such, previous studies focusing on goal-related outcomes, such as goal progress, suggest that controlled motivation is an ineffectual- albeit benign - factor in goal striving. However, emerging evidence suggests that pursuing goals for controlled reasons may come at a cost to the pursuers' well-being and psychological need satisfaction. For example, Holding et al. (2017) observed that the pursuit of controlled personal goals lead to increased symptoms of depression over the course of an academic semester. This effect was mediated by action crisis severity such that feeling controlled about one's personal goals lead to increased goal-related conflicts and doubts, which, in turn, negatively impacted the pursuers' mental health. Similarly, a longitudinal study examining career goal pursuit in young adults observed that pursuing a career

goal for controlled motives resulted in a greater sacrifice of basic psychological needs, which was associated with increased psychological distress (Holding, St. Jacques, Verner-Filion, Kachanoff & Koestner, 2019).

We sought to extend this work by studying the emotional and physical toll of controlled goal pursuit on longitudinal changes in markers of stress and ill-being. To date, only one study has linked SDT's concept of "feeling controlled" to increases in cortisol. Specifically, Reeve and Tseng (2011) experimentally examined whether being exposed to a controlling teacher was associated with increased salivary cortisol, finding that students' salivary cortisol increased as a function of the teacher's controlling motivational style during a 20-minute puzzle solving task. Building on these findings, we investigated the extent to which feeling controlled and conflicted about one's personal goals affected changes in chronic cortisol secretion.

The Present Work

In order to evaluate whether pursuing goals for controlled reasons and experiencing action crises during goal pursuit impacted changes in physiological and self-reported markers of stress and ill-being we chose a prospective longitudinal design. To maximize our observation of individuals actively engaged in the pursuit of controlled goals and thus likely to experience action crises during goal pursuit, we tracked participants pursuing three personal goals over the course of an academic year. Indicators of stress and ill-being were assessed at the start and the end of the academic year. Action crisis severity was measured approximately mid-way through the academic year, when previous research has documented that action crises are likely to set in (Brandstätter et al., 2013). We then proceeded to test our hypothesis that controlled motives for goals would bring about more severe action crisis in goal pursuit, and would indirectly predict increases in markers of stress and ill-being.

Methods

Participants

The study sample consisted of 156 university students (89% female; 57% Caucasian, 28% Asian, 4% Hispanic) ages 17–38 years (M_{age} = 19.68, *SD* = 2.41) recruited at a large public North American university. To be eligible for the hair sampling, participants were required to have hair at least 3 cm long. We also excluded participants with hair that was dyed, permed, or bleached, since there is ongoing research to determine if hair treatment affects hair cortisol levels.

Procedure

Participants were recruited through posters and class announcements to take part in a longitudinal study on personal goals and well-being. Participants had the option of just enrolling in the longitudinal survey study or also having their hair sampled for cortisol at both the beginning and at the end of the academic year. The sample included in this report represents only those participants who agreed to have their hair sampled for cortisol measurement.

At the beginning of the academic year in September (T1) participants were sent an online survey in which they identified three personal goals they planned to pursue over the course of the academic year. At this time, they also rated their motivation for each goal, as well as rating their perceived stress, health symptoms and symptoms of depression. Approximately 4-6 weeks later, they visited our lab for hair collection conducted by trained graduate students who followed the sampling guidelines outlined by Ouellet-Morin and colleagues (2016). This timeline was intended so that the middle point of the measure of chronic cortisol –which captures the previous three months of stress–, would align with the T1 survey. Three months later, at the end of the academic semester in mid-December (T2), participants completed a follow-up survey in which

action crisis severity for each goal was assessed. At the end of the academic year in April (T3), participants responded once more to the questions about their perceived stress, health symptoms and symptoms of depression, and they returned to the lab for a second hair sample. This study was approved by the research ethics board of the university, and participants were compensated $75 for their participation in this study. The attrition rate was low (T2 survey: 7%, T3 survey: 14%). Of the 156 participants who completed the first hair sampling, 90% returned for the second hair sampling in the following academic semester.

Measures

Goal Selection. Participants were prompted to nominate three goals they planned to pursue over the academic year using the instructions adapted from Sheldon and Kasser (1998). Examples of the idiographic goals that students generated were "I want to raise my GPA to a 3.5" and "I want to get back to a normal weight".

Controlled Goal Motivation. At T1 participants rated the extent to which they were pursuing each goal for external (Because somebody else wants you to, or because you'll get something from somebody if you do) and introjected reasons (Because you would feel ashamed, guilty, or anxious if you didn't—you feel that you ought to strive for this) on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) using the items assessed by Sheldon and Kasser (1998). In line with previous research, external and introjected reasons were averaged to compute controlled motivation (Koestner et al., 2008). Controlled motivation was averaged across the three personal goals (α = .68).

Action crisis. At T2, we administered the 6-item Action Crisis Scale (ACRISS) for each goal to assess action crisis severity (Brandstätter et al., 2013) using a validated English version of the scale (Holding et al., 2017). The ACRISS assesses goal conflict, setbacks, implemental

disorientation, rumination, disengagement impulses, and procrastination. A sample item is "Lately I feel torn between continuing to strive for this goal and abandoning it". Participants rated the items on a 7-point scale of 1 (*strongly disagree*) to 7 (*strongly agree*). The indicators of internal consistency were acceptable for each goal (average α = .78). Action crisis severity was averaged across the three personal goals.

Symptoms of Depression. We used a validated self-report measure of depression symptoms (Centre for Epidemiologic Studies Depression Scale, Radloff, 1977) to assess symptoms of depression at T1 and T3. The scale includes ten items such as "I could not get going", and is measured on a four-point Likert scale ranging from "rarely or none of the time" to "most or all the time". The depression symptoms score was computed by adding the items. The alphas were acceptable for both T1 (α =.73) and T3 (α = .84).

Perceived Stress Scale. The participants reported their subjective stress by completing the Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983) at T1 and T3. The PSS consists of 10 items such as, "How often have you felt difficulties were piling up so high that you could not overcome them?" on a scale from 0 (never) to 4 (very often). Four items were reverse scored. The alphas were acceptable for both T1 (α = .85) and T3 (α = .87)

Hair Cortisol. In compliment to the perceived measure of stress, hair samples were also collected at T1 and T3 for cortisol measurement. Trained graduate students cut scalp-near hair strands of approximately 1 cm width from the posterior vertex of participants' heads. The first 3 cm section of all hair samples were analyzed in a single batch at a specialized lab following the protocol outlined in Ouellet-Morin et al., (2016) and reported in pictograms per milligram (pg/mg). To derive an indicator of cortisol change over the academic year, we estimated the standardized residual of each participant's cortisol levels at T3, according to the levels noted at

the beginning of the academic year (i.e., T1). Accordingly, participants served as their own baseline control with regards to the cortisol measurement, which allowed us to indirectly control for a host of unmeasured confounders. Hair cortisol concentrations ranged from 3.63 to 137.94 pictograms per milligram (pg/mg) in the first sample (T1: *M* = 18.91, *SD* = 14.35) and from 4.66 to 106.33 pg/mg *(T2: M* = 15.36, *SD* = 12.04) in the second sample. These values were consistent with and similar in range to values obtained in other hair cortisol studies (Ouellet-Morin et al., 2016).

Physical Health Questionnaire. In order to measure subjects' perceived physical health, participants completed the 12-item Physical Health Questionnaire at T1 and T3 (PHQ; Schat, Kelloway & Desmarais, 2005). Participants responded to questions such as, "How often have you suffered from upset stomach (indigestion)?" on a Likert scale ranging from 1 *(not at all*) to 7 (*almost all of the time*). The alphas were acceptable for both T1 (α = .85) and T3 (α = .85).

Results

Preliminary Results

The descriptive information of our key variables as well as the correlation estimates between these variables are presented in Table 1. Students' perceived stress did not significantly change over the course of the academic year (T1: *M* = 1.97, *SD* = .66; T3: *M* =2.01, *SD* =.67; *t*(134) = .06 *p* = .40). However, students' health symptoms increased over the course of the academic year, from the baseline (*M* =2.85, *SD* =.99) to the end of the academic year (*M* =3.01, *SD* =1.06) *t*(134) = -2.94, *p* = .004). Likewise, students reported significantly greater symptoms of depression at the end of the academic year (*M* = 12.02, *SD* =5.73) as compared to the beginning of the academic year (*M* =10.66, *SD* = 4.66), *t*(133) = -3.53, *p*= .001. Interestingly, students' showed decreasing levels of chronic cortisol secretion over the year (T1: *M* =18.40, *SD*

=14.42; T3: M = 15.36, SD = 12.04; $t(140) = 3.41$, p= .001), despite the stability of this measure over time (r (141) = .69, $p < 0.001$).

Preliminary analyses showed that baseline cortisol concentrations did not differ between males and females. Moreover, change in chronic cortisol secretion was not significantly associated with the participants' gender, age, hair type, frequency of hair washing and conditioning, hair treatments, body-mass index (BMI) at baseline, BMI at the end-of-academic year, or the change in BMI from baseline to end-of-academic year (results available upon request).

As can be seen in the bivariate associations presented in Table 1, controlled motivation for personal goals was positively related to mid-year action crisis severity. Mid-year action crises severity was also positively associated with temporal changes noted on all four indicators of stress and health over the academic year. Change towards increased hair cortisol was positively correlated with the composite score of increases in all three subjective indicators of ill-being (r = .18, p = .04).

Structural Equation Model

A structural equation model was performed to test the role of controlled motivation for goal pursuit on action crisis severity, and the role of action crisis severity for predicting changes in hair cortisol, perceived stress, health symptoms and symptoms of depression across the academic year (see Figure 1). We computed standardized residual change scores for all the markers of stress and ill-being from baseline to T3.

In line with our hypothesis, results of the SEM analysis revealed that controlled motives for goals set at the beginning of the academic year were positively related to mid-year action crisis severity (β = 0.24 SE = 0.09, *95% CI* [.07, .40]. Moreover, mid-year action crisis severity

was positively associated with change in hair cortisol (β = .19, *SE* = 0.07, *95% CI* [.04, .32]), change in perceived stress (β = .29 *SE* = 0.09, *95% CI* [.11, .46]), change in health symptoms (β = .23, *SE* = 0.09, *95% CI* [.05, .41]), and change in depression symptoms (β = .35 *SE* = 0.08, *95% CI* [0.18, 0.50), from baseline to end of the academic year. Importantly, all the indirect paths were significant (hair cortisol: β = .05, *SE* = 0.02, *95% CI* [.01, .11]; perceived stress: β = .07, *SE* = 0.07, *95% CI* [.02, .13]; health symptoms: β = .06, *SE* = 0.03, *95% CI* [.01, .13]; depression symptoms: β = .09, *SE* = 0.04, *95% CI* [.02, .14]). These results support the mediating role of action crisis severity in explaining the indirect associations between controlled motivation for personal goals and changes in stress and health outcomes over the academic year. Overall, the proposed model had an acceptable fit to the data [MLR: $\chi 2$ (*df* =4) = 3.25, *p* = 0.52, CFI = 1.00, RMSEA = .00 (.00, .11), SRMR = .03].

Discussion

The goal of the present study was to examine whether controlled motivation for personal goals and conflicted goal striving would be associated with changes in stress levels and ill-being over time. In line with our hypothesis, we found that experiences of action crises in personal goal pursuit were associated with increases in a measure of physiological stress (i.e., hair cortisol), perceived stress, health and depression symptoms across the academic year. This is the first study to examine the long-term impact of action crises across a wide range of indicators of stress and health. Replicating Holding et al. (2017), we found that controlled motives for goal pursuit were positively associated with action crisis severity and increases in depressive symptoms. We also extended these findings by showing that controlled motivation for personal goals was indirectly associated with increases in markers of stress and poor health, via the development of action crises.

The current findings highlight the clinically relevant implications of experiencing action crises in personal goal pursuit. Personal goals play a huge role in people's everyday lives, and understanding the associations between the experience of goal-related conflict and indicators of stress, physical and mental health overtime, underscores the importance of considering action crises as part of a more integrated model of health. To date, the majority of research linking goal failure to poor adjustment has focused on how difficulties with *disengagement* from unattainable goals can have adverse effects on individuals' well-being, biological functioning and health (Wrosch, Scheier & Miller, 2013). Our findings suggest that the state preceding goal disengagement (i.e., the action crisis), may be equally costly to the individual in terms of their mental and physical health. Indeed, future research is needed to explore whether the stress and ill-being associated with action crises partially explains why failing to disengage from unattainable goals is so damaging. In other words, difficulty disengaging from blocked goals may be maladaptive precisely because it means that the individual experiences repeated and ongoing action crises. This offers an intriguing avenue for future clinical research to investigate how clinicians can help clients to reappraise problematic personal goals and effectively resolve action crises in goal pursuit.

Our study also highlights the potential risks of controlled goal pursuit, which appears to indirectly increase markers of stress and ill-being through the development of action crises. This finding adds to an emerging body of research documenting the potential harms of feeling controlled about pursuing personal goals (Holding et al., 2017; 2019). Moreover, this finding has implications for Self Determination Theory (SDT), which has a history of being focused on positive and humanistic aspects of human functioning. Indeed, there have been two recent movements within SDT to (1) study the mechanisms that bring about *both* optimal, positive

functioning and non-optimal, pathological functioning (Vansteenkiste & Ryan, 2013) and (2) to consider the biological underpinnings of the motivational process it describes (Ryan & Di Domenico, 2016). The present study advances SDT research in line with both of these endeavors by indirectly linking controlled motivation for personal goals with markers of pathological functioning (i.e., increased symptoms of depression) and (2) a biological marker of chronic stress through the experience of action crises.

Finally, our use of hair cortisol sampling for longitudinal goal research represents an important methodological contribution. This study highlights the feasibility of conducting repeated hair cortisol sampling within the context of a longitudinal survey-based study on goals and well-being. The attrition rate was low and participants responded well to the sampling procedure. Moreover, since the chronicity of the burden associated with action crises was central to the study, hair cortisol was an ideal indicator of long-term HPA axis functioning. Indeed, to date, most research on goal-related difficulties and cortisol secretion has been cross-sectional and has used short-term markers of cortisol secretion such as salivary cortisol (e.g., Brandstätter et al., 2013; Wrosch et al., 2007). Given that chronic cortisol elevation appears to be both a pathway to worsening mental health, as well as a biological marker that can be used to distinguishing clinical from non-clinical populations (Staufenbiel, et al., 2013), hair cortisol sampling may be an invaluable tool in clinical psychology research for tracking chronic cortisol levels in at-risk populations or in intervention work.

This study was not without limitations. While the longitudinal design and repeated assessments of outcomes represent strengths of this study, additional measurement times would have facilitated a more fine-tuned analysis of the temporal interplay between these variables. Moreover, the correlational design does not allow us to draw causal conclusions. Our

predominately female sample may have restricted our power to observe gender effects. In addition, replicating the results in a clinical sample would enhance the generalizability of the present results, as well as examining whether underlying clinical disorders, such as major depression, increase people's vulnerability to setting controlled goals or experiencing action crises in goal pursuit.

In conclusion, the present research contributes to clinical psychological science by identifying controlled goal motivation and action crises in goal pursuit as factors that contribute to increases in chronic stress, symptoms of depression and poor health.

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Tables and Figures for Article 2

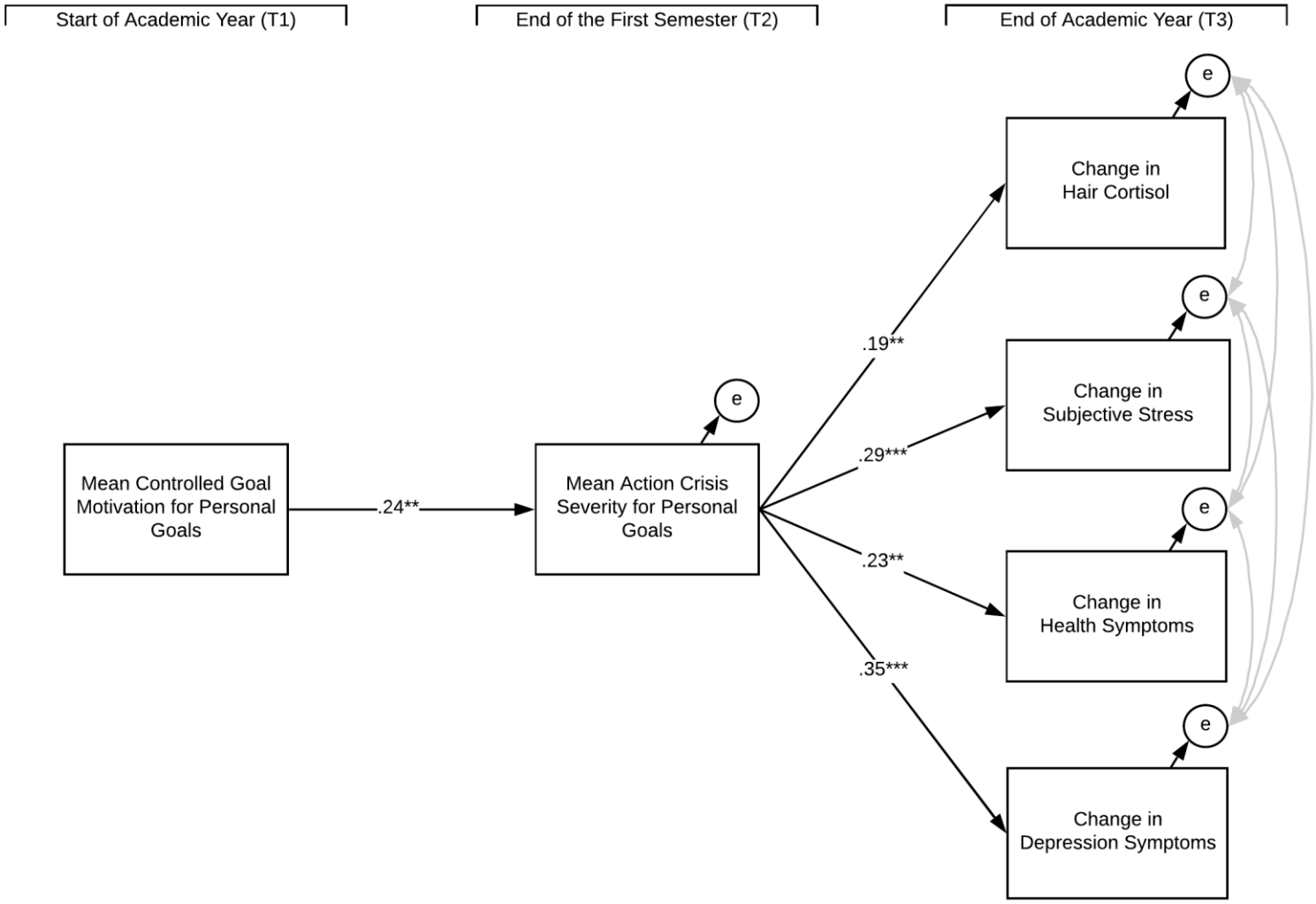
Table 1
Descriptive information and correlations between study variables.

	Mean (SD)	1.	2.	3.	4.	5.
1. Mean controlled motivation for personal goals T1	3.12 (1.14)	-				
2. Mean action crisis severity on personal goals T2	3.76 (.81)	.20*	-			
3. Change in hair cortisol T1-T3	.00 (1.00)	-.06	.20*	-		
4. Change in perceived stress T1-T3	.02 (.98)	.02	.30***	.12	-	
5. Change in health symptoms T1-T3	.00 (1.01)	.04	.23**	.19*	.38***	-
6. Change in depression symptoms T1-T3	-.07 (.93)	.00	.36***	.13	.62***	.45***

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 1

Figure illustrating final model of the results of the structural equation model.



Bridge to Article 3

Articles 1 and 2 examined the impact of controlled and conflicted goal striving on changes in symptoms of depression, stress, and poor health. We consistently found that controlled striving made individuals more susceptible to action crises in goal pursuit, which, in turn, were related to increased stress and ill-being.

Extending this work, Article 3 sought to link controlled goal striving with SDT's Basic Psychological Need Theory (BPNT). We introduced the concept of psychological needs sacrifice, suggesting that during the pursuit of demanding goals, individuals may cut themselves off from opportunities to fulfill their needs for autonomy, competence and relatedness. Given the universal importance of these three basic psychological needs (Ryan & Deci, 2017) we expected need sacrifice during goal pursuit to be damaging to the pursuer in terms of their well-being and goal progress. Moreover, we sought to distinguish the sacrifice of basic psychological needs from other common types of sacrifices made during career goal pursuit, such as the sacrifice of maintenance and leisure activities. Importantly, we expected that psychological need sacrifice would have adverse effects on pursuers' well-being and career goal progress beyond the effects of maintence and leisure activity sacrifice.

Unlike Articles 1 and 2 which examined the effects of motivation on heterogeneous goal pursuit, Article 3 focused on the pursuit of career goals, which tend to be highly demanding and can stem from controlled motives and extrinsic aspirations. We predicted that controlled motivation for career goal pursuit would arise from valuing extrinsic life aspirations, and would be positively associated with feeling pressure to sacrifice psychological needs, since controlled goals are often inconsistent with basic psychological needs (Ryan & Deci, 2017).

Article 3

Sacrifice - but at what price? A longitudinal study of young adults' sacrifice of basic psychological needs in pursuit of career goals[3]

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Abstract Article 3

Examining two, 3-wave prospective longitudinal samples of university students pursuing a career goal, we proposed that young adults make personal sacrifices during goal pursuit. Specifically, we introduced the concept of basic psychological need sacrifice and suggested it is distinguishable from the sacrifice of maintenance and leisure activities. We found that sacrificing basic psychological needs had enduring affective and self-regulatory costs through the effect of increased need frustration over the academic year. Moreover, we found that the sacrifice of psychological needs stemmed from controlling motivational processes, such as extrinsic life aspirations, controlled career goal motivation (assessed at the start of the academic year) and controlled motivation for sacrificing (assessed midyear along with the three types of sacrifices). Psychological distress and need frustration were assessed at baseline and end-of-academic-year, while career goal progress was assessed at the end of the academic year. The implications of these findings for basic psychological needs theory are discussed.

Keywords: *Self-determination theory · Need sacrifice · Basic psychological needs theory · Need frustration · Career goals · Distress*

Sacrifice - but at what price? A longitudinal study of young adults' sacrifice of basic psychological needs in pursuit of career goals.

"Great achievement is usually born of great sacrifice." - Napoleon Hill

"Your success is determined by what you are willing to sacrifice for it."- Anonymous

As exemplified in the two quotes above, North-American culture seemingly highlights the importance of making sacrifices to reach important goals. This is especially relevant for young adults, who find themselves in the developmental life stage that is ideal for embarking on a career path and laying the foundation for future professional life (Heckhausen, Wrosch & Schulz, 2019). As such, young adults may make personal sacrifices to reach their career goals, especially if they are desirous of a particular career goal outcome (Zimmerman, 1990). For example, university students may reduce sleep (Gilbert, & Weaver, 2010), socializing (VanKim & Nelson, 2013), or self-care activities (Hermon & Davis, 2004) for additional study time. We propose that in addition to sacrificing maintenance and leisure activities, students may also come to sacrifice the basic psychological needs that are required for optimal growth and well-being (Ryan & Deci, 2017, Vansteenkiste & Ryan, 2013). For instance, students may neglect their basic need for freedom and choice as they force themselves to study for their program – a sacrifice of autonomy. Students may block themselves from learning new things that do not directly contribute to their career – a sacrifice of competence. Finally, students may lock themselves away with their books, isolating themselves from human connection – a sacrifice of relatedness. We propose that need sacrifice in goal pursuit comes at a cost, initiating wider disruptions in affective and self-regulatory functioning. To this end, the present research examines 1) Whether there is evidence for different types of sacrifice among young adults pursuing a career goal, 2) The extent to which the sacrifice of basic psychological needs is

associated with need frustration, psychological distress, and goal progress over time, and 3) Whether motivational factors predispose young adults to sacrifice their psychological needs when pursuing career-related goals.

Career Goals

An important way in which young adults give direction and meaning to their lives is by pursuing career goals (Erikson, 1959). Indeed, it has been argued that to successfully achieve an identity, young adults must explore different vocational paths, deal with ensuing crises, and make an autonomous commitment to a chosen career (Marcia, 1966). Successful pursuit of career goals is usually associated with increased well-being, while failure to achieve such goals is linked with psychological distress (Lent & Brown, 2008). However, Self-Determination Theory (SDT; Ryan & Deci, 2017) researchers have argued that "not all goals are created equal" and that the pursuit (or even, the attainment) of certain goals can backfire and interfere with growth and development (Ryan, Sheldon, Kasser, & Deci, 1996).

An example of how the successful pursuit of certain career goals can undermine affective and self-regulatory outcomes was outlined in a series of studies by Sheldon and Krieger (2004; 2007; 2014) on the life trajectories of law students. This research demonstrated that over three years, law students decreased in their subjective well-being (Sheldon & Krieger, 2004, 2007), felt increasingly more controlled in their motivation for studying law (Sheldon & Krieger, 2004; 2007) and experienced declines in psychological need satisfaction (Sheldon & Krieger, 2007). Moreover, Sheldon and Krieger (2007) provided evidence that there were motivational repercussions from need frustration during law school that were later evident in the form of lower grade point averages, worse bar exam results, and less self-determined motivation for the first job after graduation. These repercussions extended to lawyers' careers, with Sheldon and

Krieger (2014) finding that well-earning lawyers in money-oriented job contexts tended to experience lower well-being and more drinking behaviour than less earning lawyers in service-oriented job contexts. The authors interpreted the changes in motivation and well-being in terms of the emphasis that law school and money-oriented job contexts places on evaluation, competition, and the pursuit of extrinsic goals. A similar pattern of longitudinal results was obtained for business students and it was also explained in terms of controlling contextual factors (Jiang, Song, Ke, Wang, & Liu, 2016).

The studies above suggest that a contextual emphasis on evaluation, competition and extrinsic rewards can impair the affective and self-regulatory functioning of young adults. Moreover, there are a number of studies that speak to the cost of need frustration in the educational contexts. Teachers' controlling behavior, for example, has been linked with poor motivational functioning and need frustration in students (Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegem, 2015), as well as increased student anger and bullying behavior (Hein, Koka & Hagger, 2015). Individual differences, such as self-critical perfectionism, may also play a role in diminishing need satisfaction and enhancing need frustration, which in turn, relate to academic maladjustment (Vandenkerckhove et al., 2019). This prompted us to investigate whether young adults pursuing career goals are frustrated in their needs by making personal sacrifices for their career goal.

Sacrifices in Career Goal Pursuit

Previous studies in the area of work-life balance have examined the question of why career goals often go hand-in-hand with harmful sacrifices. Researchers have used the term "trade-offs" to capture the sacrifices that adults make because of their careers. Sacrifice in pursuit of one's career can take many forms. For example, Mennino and Brayfield (2002) found

that individuals in demanding careers chose to sacrifice time at home to fulfill work requirements, reflecting a clash between family and employment responsibilities. Other studies suggest that adults sacrifice sleep, leisure activities, and relaxation to pursue demands at work (e.g., Barnett & Rivers, 1996). The research reviewed on work-life trade-offs point to a variety of activities that individuals sacrifice in the pursuit of work goals – sleep, exercise, house-work, caring for others, leisure, and relaxation. The sacrificed activities can be grouped according to a distinction drawn from time-use studies between maintenance activities and leisure activities (Csikszentmihalyi, 1997; Csikszentmihalyi & Lefevre, 1989). Maintenance activities aim to sustain stable, healthy functioning and include housework, eating and grooming. Leisure refers to freely-chosen activities that often have a social nature (e.g., social events, sports, and hobbies). Although adults typically divide their waking time roughly equally between work and leisure or maintenance activities (Csziksentmihalyi, 1997), young adults who have ambitious career goals may devote more time to academics at the expense of their maintenance and leisure activities.

Psychological Need Sacrifice

We propose that in addition to sacrificing maintenance and leisure activities, individuals may sacrifice their psychological needs in the pursuit of their career goals. The relationship between basic psychological needs and goal-linked sacrifices can be understood within the context of Basic Psychological Needs Theory (BPNT), a mini-theory developed within SDT (Ryan & Deci, 2017). BPNT posits three basic psychological needs, (i.e., autonomy, competence and relatedness), which, when satisfied, promote development and well-being. Autonomy represents the need to volitionally endorse one's actions. Relatedness refers to the need to feel connected to others. Competence refers to the need to experience mastery. Many studies have

shown a significant association between satisfaction of these needs and indicators of personal growth and thriving (Ryan & Deci, 2017).

Importantly, research has distinguished between need deprivation, resulting from a lack of need satisfaction, and need frustration, resulting from active blocking or thwarting of needs (Bartholomew, Ntoumanis, Bosch, Ryan, & Thøgerson-Ntoumanis, 2011). There is emerging evidence that the negative effects of need frustration are more far-ranging than those of need deprivation (Vansteenkiste & Ryan, 2013). For example, social contexts which thwart one's basic psychological needs, such as having a controlling parent, coach, or teacher, have been associated with diminished psychological functioning (Mabbe, Soenens, Vansteenkiste, van der Kaap-Deeder, & Moratidis, 2018; van der Kaap-Deeder, Vansteenkiste, Soenens, & Mabbe, 2017). Need frustration has been related to maladaptive outcomes in domains such as exercise (Gunnell, Crocker, Wilson, Mack, & Zumbo, 2013), work (Bartholomew, Ntoumanis, Cuevas, & Lonsdale, 2014) and school (Hein, Koka, & Hagger, 2015).

The prospect of enhanced career success may render the perceived sacrifice in psychological needs worthwhile, and is defensible from a life-span perspective which outlines the age-graded opportunities for optimal pursuit of certain goals (Heckhausen, Wrosch, Schutz, 2010; 2019). For example, an individual may sacrifice their need for relatedness by giving up on building and maintaining friendships, or shutting themselves off to potential romantic connections, with the aim of devoting more time to their career goal. Alternatively, an individual may sacrifice their need for autonomy by giving up choice and spontaneity in daily life, disconnecting from their internal compass of personal interests and values, with a single-minded focus on the demands of career goal pursuit. Lastly, an individual may sacrifice their need for competence by forgoing opportunities to excel in domains unrelated to their career path, such as

sports or social events. However, contrary to the career-striving individual's intentions, these sacrifices may lead to a frustration in basic psychological needs over time, which may ultimately undermine the individual's efforts to make progress on their career goal along with impairing his or her well-being. Given the pathogenic nature of need frustration (Vansteenkiste & Ryan, 2013), we propose that psychological need sacrifice also relates to greater psychological distress and reduced career goal progress: a relation mediated by increased psychological need frustration. Because need frustration rather than need deprivation has more detrimental consequences (Vansteenkiste & Ryan, 2013) we did not expect need deprivation to explain the potentially harmful consequences of need sacrifice.

Antecedents of Psychological Need Sacrifice

In addition to examining the affective and self-regulatory consequences of different forms of goal-related sacrifices, we also aimed to study the motivational antecedents of need sacrifices. In particular, we sought to explore the extent to which sacrificing needs reflected a volitional process. In the tradition of SDT, we broached the issue of volition by distinguishing between autonomous and controlled motivation. Autonomy is reflected in pursuing activities because they are interesting or personally meaningful (e.g., intrinsic, integrated, and identified motivation); control is reflected in pursuing activities because one feels pressured either by internal or external forces (e.g., introjected motivation and external regulation).

There is now considerable evidence that pursuing extrinsic aspirations often results in lower well-being and higher levels of psychological distress because such pursuits distract from satisfying basic psychological needs (Hope, Holding, Verner-Filion, Sheldon & Koestner, 2019; Hope, Koestner, Holding, & Harvey, 2016; Hope, Milyavskaya, Holding, & Koestner, 2014; Kasser & Ryan, 1993; 1996), and that this is true even when people successfully attain their

extrinsic goals (Niemiec, Ryan & Deci, 2009). Likewise, findings obtained by Vansteenkiste and colleagues (2007) showed associations between extrinsic value orientation and need frustration. It may be the case that extrinsic values influence people's career-related decisions, such as their motivation for embarking upon a particular career path, which may enhance the sense of pressure to make sacrifices for a career goal.

Similarly, there is considerable evidence that pursuing personal goals for controlled reasons is associated with increased goal-related difficulties, less vitality, and poorer mental health outcomes (e.g., Holding, Hope, Harvey, Marion-Jetten, & Koestner, 2017; Sheldon & Elliot, 1999). In our study, we predicted that controlled motivation for career goal pursuit would arise from valuing extrinsic life aspirations, and would be positively associated with feeling pressure to sacrifice psychological needs, since controlled goals are often inconsistent with basic psychological needs.

In turn, we also explored young adults' specific motivation for making sacrifices during career goal pursuit. We reasoned that autonomous reasons for making sacrifices would be incompatible with renouncing basic psychological needs, as integrated or identified motives for sacrificing would imply that the individual had accurately identified essential needs, core values and interests, and would be hesitant or unwilling to sacrifice them. Instead, we suspected that individuals perceiving pressure to make sacrifices for their goal would more readily ignore or disregard basic psychological needs through need sacrifice. In other words, we expected psychological need sacrifice to reflect the pursuers' limited understanding or poor self-assessment of his or her fundamental needs for growth and thriving, much like Sheldon (2014, p.355) characterized individuals pursuing controlled goals as being "out of touch with themselves". Importantly, based on recent work by Hope and colleagues (2019) who showed

how extrinsic aspirations predict increases in controlled motivation during goal pursuit, we expected that extrinsic aspirations would lead to greater controlled regulation in career goal pursuit and, in turn, greater controlled motives for sacrificing.

The Present Study

To test our hypotheses, we conducted two 3-wave prospective longitudinal studies with university students across the academic year. We wanted to study need sacrifice in individuals pursuing a career goal, which included both undergraduates and graduate students. We have outlined our hypotheses in a theoretical model (Figure 1).With respect to our first question of whether there would be evidence for different types of personal sacrifices among young adults pursuing a career goal, we expected there to be evidence of all three types of sacrifice (psychological need sacrifice, maintenance activity sacrifice, and leisure activity sacrifice). We suspected that need sacrifice would be distinguishable from maintenance activity sacrifice (e.g., sleep, exercise, healthy eating) and leisure sacrifice (e.g., time with friends, community involvement, hobbies).

Our second question focused on understanding how need sacrifice related to outcomes. We hypothesized that need sacrifice would be positively associated with need frustration over the academic year. We planned to test the specificity of this linkage by comparing the effects of need sacrifice to the sacrifice of maintenance and leisure activities. Moreover, we hypothesized that sacrificing basic psychological needs to reach a career goal would increase psychological distress and decrease career goal progress, and that these effects would be mediated by need frustration.

Thirdly, we hypothesized that certain motivational factors would predispose individuals to experience psychological need sacrifice. Specifically, we expected the sacrifice of

psychological needs to stem from controlled processes at multiple levels of generality. Starting with the broad perspective of life aspirations, we expected that an emphasis on extrinsic aspirations would lead to greater controlled motives for the career goal, and that greater controlled career-goal motives would enhance controlled motives for sacrificing. Finally, we expected controlled motives for sacrificing needs to result in greater psychological need sacrifice. We sought to answer these questions by testing our theoretical model (see Figure 1) with an integrative structural equation model in both samples.

Methods

Participants and Procedure

Two identical year-long studies on goals were conducted at a large public Canadian university. Participants were recruited through advertisement posters placed across campus. The questionnaires were administered through the online survey software Qualtrics. Six surveys were administered throughout the academic year; however, data regarding career goals were only assessed at the beginning (T1; September), middle (T2; December) and end (T3; May) of the academic year. Participants were reminded of their career goals at each follow-up via an idiographic information plug-in function on the online survey platform Qualtrics. In other words, when answering questions about their career goal, each participant would see the career goal they had entered into the survey at the beginning of the study. The study was conducted in compliance with the University Research and Ethics Board, and participants received financial compensation ($50 CAD) in both studies.

For Sample 1, a sub-sample of 352 was selected from a larger sample of 508 participants who participated in a year-long study on goals. This sub-sample indicated that (1) they were actively pursuing their career goal at the moment, and (2) the university degree they were

currently pursuing related directly to their career goal. Participants were predominantly female (83%) with an average age of 21.6 years (*SD* = 4.02; ranging from 17 to 54), and were predominantly Caucasian (57%) and Asian (32%). Approximately one third of the retained sample (27%) was registered in graduate programs. Importantly, neither year in program nor level of education (undergraduate versus graduate) were associated with level of sacrifice (i.e., for maintenance activities, leisure activities, or psychological need sacrifice). The completion rate for the surveys was 88% for midyear and 87% for the end of the year assessment; t-tests were used to compare the participants who completed all three time points with those who did not on the baseline measures. No differences approaching significance (p's > .10) were found for all variables of interest.

For Sample 2, we recruited 231 participants pursuing a career goal. Of this sample, 14 participants were not actively pursuing a career goal and were not included in the analyses. Of the retained sample (N = 217), 90% of participants indicated that the university degree they were currently pursuing related directly to their career goal. This sample was predominantly female (85%) and predominantly Caucasian (77%) and Asian (21%), with an average age of 19.85 (*SD* =2.40 range 17 to 38). In this sample, 5% of students were in graduate programs. The completion rate for the surveys was 94% for midyear and 87% for the end of the year. T-tests were used to compare the participants who completed all three time points with those who did not on all of the baseline measures. No differences approaching significance (p's > .20) were found for all variables of interest.

Measures

Time 1- Beginning of First Semester

*Career Goal Description***.** Participants were asked to type out their career goal following the prompt "*What is your career goal? In other words, what career are you planning on pursuing or are on the path towards pursuing?*"

Life Aspirations. A 12 item shortened version of the Aspirations Index was used to measure intrinsic and extrinsic aspirations (Kasser & Ryan, 1996). Participants were asked to rate the importance of 12 life aspirations, ranging from 1 "*not at all important*" to 7 "*very important*". Participants rated 6 items indicative of intrinsic aspirations such as "to have committed, intimate relationships" and "to grow and learn new things" which were averaged to compute *intrinsic aspirations* (Sample 1: α = .72; Sample 2 α =.62). Participants also rated 6 items indicative of extrinsic aspirations such as "to have enough money to buy everything you want" and "to be admired by lots of different people" which were averaged to compute *extrinsic aspirations* (Sample 1: α = .78; Sample 2: α =.79).

Career Goal Motivation. Participants were asked to reflect on why they were pursuing the career they had indicated. Single items were used to assess intrinsic, integrated, identified and external regulation for the career goal (Koestner, Powers, Milyavskaya, Carbonneau, & Hope, 2015) and participants rated their responses on a seven-point Likert scale from (1) "Strongly Disagree" to (7) "Strongly Agree". Introjected career motivation was assessed using two items: "Because you would feel ashamed, guilty, or anxious if you didn't—you feel that you ought to strive for this." and "My self-worth will be affected by how well I do in pursuing this career". External regulation was assessed with one item "Because somebody else wants you to, or because you'll get something from somebody if you do." Controlled motivation was calculated as the mean of the two introjection and one external regulation items (Sample 1 : α = .47; Sample 2 : α = .54). Autonomous motivation was calculated as the mean of intrinsic

("Because of the fun and enjoyment which the goal will provide you—the primary reason is simply your interest in the experience itself."), integrated ("Because it represents who you are and reflects what you value most in life.") and identified reasons ("Because you really believe that it is an important goal to have—you endorse it freely and value it wholeheartedly.") (Sample 1: α = .79: Sample 2: α = .72).

Need Frustration. The need frustration subscale of the Balanced Measure of Psychological Needs scale (BMPN; Sheldon & Hilpert, 2012) was used to assess psychological need frustration at baseline and T3. Participants were asked to rate their agreement with a series of statements on a 7-point scale ranging from "*not at all true*" to "*very true*". Need Frustration was assessed with 9 items, 3 statements for each need (autonomy, competence, relatedness; Sample 1: α = .78; Sample 2: α=. *79*). For example, the item "I experienced some kind of failure or was unable to do well at something" was used to assess competence need frustration.

Psychological Distress. The 10-item Centre for Epidemiologic Studies Depression Scale Revised (CESD-R 10; Björgvinsson, Kertz, Bigda-Peyton, McCoy, & Aderka, 2013) was used to assess depressive symptoms at baseline and T3. The CESD-R 10 is a validated self-report measure of depressive symptoms which focuses on the affectivity component of depressed mood. The scale includes ten items such as "I could not get going" using a four-point Likert scale ranging from "rarely or none of the time (<1 day)" to "most or all the time (5-7 days)" T1 (Sample 1: α = .80; Sample 2: α = .75) and T3 (Sample 1: α = .83; Sample 2: α =.84).

Negative Affect was assessed using a 5-items version of the negative affect subscale of the Positive and Negative Affect Schedule in Sample 1 and the 10-item version in Sample 2 (PANAS; Watson, Clark & Tellegen, 1988) at both at T1 (Sample 1: α = .78; Sample 2: α =.82) and T3 (Sample 1: α = .82; Sample 2: α =.83). Participants were asked to rate the extent to which

they had felt certain feelings and emotions (e.g., “irritable”) over the past week using a 7-point scale ranging from 1 “*not at all*” to 7 “*extremely*”. The reliability and validity of a short form of the negative affect scale was confirmed by Mackinnon et al., 1999.

Since depressive symptoms and negative affect were highly positively related (r = .68), we formed a combined psychological distress measure by standardizing each scale and calculating a mean for both T1 and T3. Similar combining of depressive symptoms and negative affect was reported in Saragovi, Koestner, Di Dio and Aubé (1997).

Time 2 – Midyear

Motivation for Career-Related Need Sacrifices. After being reminded of their career goal, participants were asked to rate the extent to which they made their career-related sacrifices for autonomous reasons: “because I want to, it feels personally meaningful to do so” and controlled reasons “because I feel like I ought to, other people want me to” on 100-point slider scale. Similar single item slider scale motivation assessments were used by Holding, Fortin, Carpentier, Hope and Koestner (2018).

Career Goal-Related Sacrifice. Participants were asked to rate their career goal-related sacrifices by responding to the question “In order to pursue your career goal, how much have you had to make the following sacrifices?” followed by a series of 14 items. Ratings for these sacrifice items were made on a seven-point Likert scale ranging from (1) “Not at all*”* to (7) “Very much*”*. These 14 items corresponded to three different types of sacrifice*: sacrifice of maintenance activities* (6 items) involved giving up on activities such as healthy eating, enough sleep, and enough exercise (Sample 1: α = .83; Sample 2: α = .88); *sacrifice of leisure activities* (5 items) involved giving up activities such as hobbies, dating, and community (Sample 1: α = .82; Sample 2: α = .87). The *maintenance activity sacrifice* and the *leisure activity sacrifice* items

were adapted items found in the American Time Use Survey (ATUS; e.g., Basner et al., 2007). The American Time Use Survey is a United States wide survey sponsored by the Bureau of Labor Statistics and conducted by the United States Census Bureau which provides data on the amount of time that Americans spend on various activities, such as work, leisure, socializing and personal care. The ATUS data and scales have been employed in a wide variety of publications (e.g., Eldridge & Pabilonia, 2010; Kofman & Bianchi, 2012) and are both reliable and valid (United States Bureau of Labor Statistics, 2018). We chose to base our scale on the ATUS in order to include a list of sacrifice items that is comprehensive, consistent with the previous research on work-life trade-offs (e.g., Caproni, 1997; Mennino & Brayfield, 2002), and related to Csikszentmihalyi's (1997) distinction between maintenance and leisure activities.

After indicating the extent to which they were sacrificing various activities, participants received the prompt "Making personal sacrifices for my career has ….." followed by three items used to assess basic psychological needs on the Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012). The items were "Made me feel less connected to people than usual." (*relatedness*), "Made me feel less competent than usual." (*competence*), "Made me feel more pressured and less free than usual."(*autonomy*) (Sample 1: α = .77; Sample 2: α = .82).

Time 3 – End of Academic Year

Career Goal Progress. Career goal progress was assessed at the end of the year with two items: "I have made a lot of progress toward this goal" and "I feel like I am on track with my career goal plan." A similar method has been used in previous studies (e.g., Koestner, Lekes, Powers, & Chicoine, 2002; Koestner, Powers, Carbonneau, Milyavskaya, & Chua, 2012). All ratings were made on a 7-point scale ranging from (1) "Strongly Disagree" to (7) "Strongly

Agree". In the follow-up surveys, participants were reminded what their specific career goal had been at the beginning of the year (Sample 1: α = .88; Sample 2: α =.95).

Results

Plan of Analyses

The results are organized into two sections: preliminary analyses and primary analyses. In our preliminary analyses section, we report the factor structure of the measures related to sacrifice to distinguish need sacrifice from A) maintenance and leisure activity sacrifice and B) need frustration. We used Sample 1 to conduct exploratory factor analyses (EFAs), and Sample 2 to conduct confirmatory factor analyses (CFAs). Next, we report descriptive analyses related to all the main variables in the study. In the primary analyses section, we report the results of an integrative structural equation model tested in both samples. This model tested both the role of the hypothesized antecedents on psychological need sacrifice, as well as the mediating role of change in need frustration in the associations between need sacrifice and the outcomes of change in psychological distress and end-of-year career goal progress. All structural equation modeling (SEM) and CFA analyses in the present study were performed on a raw data file using robust maximum likelihood estimation (MLR) procedures with MPLUS 7.3 (Muthén & Muthén, 2012) because this method is able to handle potential deviations in normality. Prior to all analyses, variables were examined for accuracy of data entry, normality, missing data, and fit between their distributions and the assumptions underlying maximum likelihood procedures (Tabachnick & Fidell, 2007). The missing values in Sample 1 (10.6%) appeared to be missing at random (Little's MCAR χ^2 (df = 34) = 27.39, p = .78. In Sample 2, 5.4% of the values appeared to be missing at random (Little's MCAR χ^2 (df = 31) = 45.82, p = .04. Further inspection of the missing data showed that participants who did not respond to the controlled motivation for

sacrificing report lower levels of all three types of sacrifices ($F > 9.23$, $p < .003$), as well as lower levels of change in need frustration over the duration of the study ($F > 4.42$, $p < .04$). As recommended by Graham (2003), the full information maximum likelihood (FIML) procedure implemented within MPlus was used to handle missing data in both samples. FIML is considered to be the most effective method to estimate models with missing data (Allison, 2003). Finally, the following fit indices were given priority in model evaluation: the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR). According to Kline (2011) the CFI should be .95 or higher, while the RMSEA and SRMR should be 0.06 or lower for acceptable model fit.

Preliminary Analyses

To provide evidence for the distinctiveness of the three types of sacrifices, we conducted exploratory factor analyses (EFA) with all 14 sacrifice items in Sample 1, using maximum likelihood extraction with direct oblimin rotation to allow for correlated factors. Two items hypothesized to be part of the leisure activity sacrifice subscale showed high cross-loadings and were thus dropped from further analyses: sacrifice of personal goals showed high cross-loadings on leisure sacrifice and the psychological need sacrifice subscales, whereas household activities cross-loaded highly onto the leisure sacrifice and the maintenance sacrifice subscales. Appendix A shows the factor loadings from the rotated matrix for all 12 items kept for the EFA, which yielded a three-factor solution that accounted for 64% of the variance. The first factor consisted of five items and represented sacrifice of maintenance activities (Eigenvalue = 5.34, average loading = 0.62); the second factor consisted of three items and represented sacrifice of psychological needs with an (Eigenvalue = 1.30, average loading = 0.71); finally, the third factor consisted of four items and represented sacrifice of leisure activities (Eigenvalue = 1.05, average

loading = 0.65). In Sample 2 a confirmatory factor analysis (CFA) was conducted to confirm the three-factor structure of the sacrifice items. Results of the CFA provided support for the distinction between all three facets (see Appendix B): MLR $\chi 2$ (*df* = 51*)* = 74.30, *p* = .02, CFI = .98, RMSEA = .05 (.02, .07), SRMR = .04

Using the same procedure outlined above we conducted a second EFA to distinguish psychological need sacrifice from need frustration (see Appendix C). Two factors emerged and accounted for 44% of the variance. The first consisted of the nine need frustration items, with an Eigenvalue of 3.59 (average loading = 0.52); the second consisted of three items representing psychological need sacrifice with an Eigenvalue of 1.74 (average loading = 0.76). Next, we conducted a CFA with the Sample 2 data (see Appendix D). Items from the need sacrifice and need frustration scales were used as indicators of the two latent variables. The results of an initial CFA revealed an unacceptable model fit: MLR χ^2 (*df* = 53) = 140.57, *p* < .001, CFI = .86, RMSEA = .09 (.07, .11), SRMR = .07. Inspection of the modification indices provided by MPLUS suggested the addition of correlated residuals between one set of items from the frustration of competence subscale (items 1 with 9) as well as between two sets of items from the frustration of relatedness subscale (items 4 with 2 and 8). Allowing residuals to correlate indicates that measures are related to each other for reasons other than the latent variable of interest (e.g., item wording; see Cole, Ciesla, & Steiger, 2007). In the current analysis, all correlated residuals occurred within competence frustration and relatedness frustration, and were positively related. This revised two factor model yielded acceptable fit indices: MLR χ^2 (*df* = 50) = 84.72, *p* = .002, CFI = .94, RMSEA = .06 (.04, .08), SRMR = .06.

The mean levels of all three forms of sacrifice were moderately high, straddling the midpoint of the 1-7-point scale. In both samples, paired t-tests showed that both leisure activity

sacrifice (M_1= 4.23, M_2 = 3.99) and psychological need sacrifice (M_1= 4.10, M_2 = 4.09) were rated significantly higher than sacrifice of maintenance activities (M_1= 3.91, M_2=3.56), [Leisure vs. maintenance sacrifice: Sample 1 $t(351) = -5.44$, $p < .001$, Sample 2 $t(216) = -5.85$, $p < .001$; psychological needs vs. maintenance sacrifice: Sample 1 $t(351) = -2.72$, $p = .007$, Sample 2 $t(216) = 5.57$, $p < .001$]. There was no mean difference between leisure and psychological need sacrifice in either sample.

Preliminary analyses examined the relations of gender and age to all of the major variables in both samples. In Sample 1, there was only one significant effect for gender with females scoring higher on intrinsic aspirations ($r = .16$, $p = .003$). Three significant effects emerged for age with older participants reporting greater leisure activity sacrifice ($r = .16$, $p = .004$), less need frustration ($r = -.14$, $p = .02$), and less psychological distress ($r = -.15$, $p = .01$). In Sample 2, there were two significant effects for gender with females scoring higher on intrinsic aspirations ($r = .21$, $p = .002$) and on psychological distress ($r = .18$, $p = .01$). Three significant effects emerged for age with older participants reporting greater leisure activity sacrifice ($r = .21$, $p = .002$) and maintenance sacrifice ($r = .16$, $p = .02$). Older participants also reported greater career goal progress ($r = .23$, $p = .002$). No other gender or age effects approached significance in the two studies. The results that we present in later sections remain unchanged if gender and age are controlled for.

To assess change in need frustration and psychological distress over the course of the academic year, two residualized change scores were obtained by conducting a regression analysis with the T3 measurement entered as the dependent variable and the T1 measurement entered as the independent variable. The residual value of need frustration and psychological distress obtained from these analysis represent change in the variable that cannot be predicted

from the initial value of the variable (Zumbo, 1999). Correlations and descriptive statistics for the main variables in the study are presented in Table 1. Correlations showed that in both studies need sacrifice was positively related to controlling motivational processes, such as extrinsic aspirations, controlled motivation for pursuing the career goal, and controlled motives for sacrifice during career goal pursuit. Psychological need sacrifice was positively associated with change in need frustration and psychological distress over the year. There were also positive associations between the different forms of sacrifice.

Primary Analyses

To answer our questions about the antecedents and outcomes of psychological need sacrifice, we tested the same integrative structural equation models in each sample. In the first part of the model, we entered the three hypothesized antecedents of need sacrifice in order of most general (extrinsic life aspirations) to most specific (controlled motives for sacrificing). Next, we entered the three types of sacrifices. Finally, we entered the outcomes which included changes in need frustration, changes in psychological distress, and career goal progress (see Figure 2). Moreover, we sought to test if the path from extrinsic aspirations to need sacrifice was mediated by controlled career goal motivation and controlled motives for sacrificing. Next we tested whether change in need frustration mediated the associations between both need sacrifice and increases in end-of-year distress, as well as end-of-year career goal progress.

With regards to our hypotheses about the antecedents of need sacrifice, results of the SEM analysis revealed that extrinsic aspirations were positively related to controlled career goal motives (Sample 1: β = 0.21 *SE* = 0.05, *95% CI* [0.12, 0.31]; Sample 2: β = 0.37, *SE* = 0.06, *95% CI* [0.24, 0.49]). Controlled career goal motives were positively related to controlled motives for sacrificing (Sample 1: β = 0.30, *SE* = 0.05, *95% CI* [0.20, 0.39]; Sample 2: β = 0.32, *SE* = 0.06,

95% CI [0.18, 0.44]), and controlled motives for sacrificing were positively associated with psychological need sacrifice (Sample 1: β = 0.28 *SE* = 0.06, *95% CI* [0.17, 0.39]; Sample 2: β = 0.44, *SE* = 0.06, *95% CI* [0.31, 0.54]). The indirect path from extrinsic aspirations to psychological need sacrifice was significant (Sample 1: β = 0.02, *SE* = 0.01, *95% CI* [0.01, 0.04]; Sample 2: β = 0.05, *SE* = 0.02, *95% CI* [0.03, 0.09]), suggesting that this path is mediated by controlled motives for the career goal and controlled motives for sacrificing. Controlled motives for sacrificing were also positively related to maintenance activity sacrifice (Sample 1: β = 0.26, *SE* = 0.06, *95% CI* [0.15, .37]; Sample 2: β = 0.24, *SE* = 0.08, *95% CI* [0.09, 0.39]), and leisure activity sacrifice (Sample 1: β = 0.23, *SE* = 0.06, *95% CI* [0.11, 0.34]; Sample 2: β = 0.15, *SE* = 0.07, *95% CI* [0.01, 0.30]).

With regards to our hypotheses about the outcomes of need sacrifice, results of the SEM analysis revealed that psychological need sacrifice[4] was positively associated with change in need frustration (Sample 1: β = 0.20, *SE* =0.06, *95% CI* [0.07, 0.31]; Sample 2: β = 0.23, *SE* =.07, *95% CI* [0.09, 0.37]). Change in need frustration was positively associated with change in end-of-year distress (Sample 1: β = 0.66, *SE* = .03, *95% CI* [0.59, 0.72]; Sample 2: β = .59, *SE* = .05, *95% CI* [.48, .69) and negatively associated with end-of-year career goal progress (Sample 1: β = -.20, *SE* = .06, *95% CI* [-.31, -.08]; Sample 2:(β = -.19, *SE* = .09, *95% CI* [-.35, -.02]). The indirect path from need sacrifice to increased need frustration to increased distress was significant (Sample 1: β = 0.13, *SE* = .04, *95% CI* [0.05, 0.20], Sample 2: β = .14, *SE* = .05, *95% CI* [0.05, 0.23]). Likewise, the indirect path from need sacrifice to increased need frustration to career goal progress was also significant (Sample 1: β = -.04, *SE* = .02, *95% CI* [-.08, -.01],

[4] We did not find a moderating role for motivation for sacrifice. In other words, regardless of whether individuals felt more autonomous or controlled about sacrificing their needs, the sacrifice of psychological needs enhanced psychological distress and negatively impacted goal self-regulation.

Sample 2: β = -.04, *SE* = .03, 95% *CI* [-0.11, -0.01]). These results support the mediating role of change in need frustration in explaining the associations between need sacrifice and the outcomes of change in end-of-year distress and career goal progress. There was also a significant positive association between leisure sacrifice and end-of-year career goal progress (Sample 1: β= .15, *SE* = .06, *95% CI* [.03, .27], Sample 2: (β = .18, *SE* = .08, *95% CI* [.03, .33]), such that the sacrifice of leisure activities midyear was associated with greater career goal progress end-of-year. Overall, the proposed model had an excellent fit to the data in both Sample 1: MLR $\chi 2$ (*df* = 23) = 20.53, *p* = .61, CFI = 1.00, RMSEA = .00 (.00, .04), SRMR = .05; and Sample 2: MLR $\chi 2$ (*df* = 23) = 31.17, *p* = .11, CFI = .98, RMSEA = .04 (.00, .07), SRMR = .06.

Discussion

Two large prospective, multi-wave longitudinal studies explored the extent to which young adults sacrifice their basic psychological needs in the pursuit of career goals. Results from *both* samples confirmed that need sacrifice is distinct from the sacrifice of maintenance and leisure activities, as well as from the experience of need frustration. The young adults in our studies indicated they were making high levels of sacrifice in the pursuit of their career goals. The majority of students reported leisure and need sacrifice levels that were above the midpoint of the scale. The sacrifice of leisure activities and psychological needs was more common than sacrifice of maintenance needs. The results of *both* samples converged to show that psychological need sacrifice was associated with increased psychological distress and impaired career goal progress, and that these associations were mediated by need frustration. Thus, the sacrifice of basic psychological needs for career goals seemed to backfire such that progress on career goals was less likely to be achieved and, concomitantly, students' level psychological distress increased. Finally, *both* studies provided evidence that psychological need sacrifice

stemmed from controlled motivational processes. Our results suggested that placing an emphasis on extrinsic life aspirations made individuals more susceptible to feeling controlled about their career goal, and that these controlled motives for the career translated into greater controlled motives for making personal sacrifices. Moreover, controlled career goal motivation and controlled motivation for sacrificing appeared to serially mediate the positive association between extrinsic aspirations and psychological need sacrifice in *both* samples.

Outcomes Associated with Sacrificing

Our results have theoretical and practical implications for SDT and Basic Psychological Needs Theory (BPNT). The current studies contribute to SDT and BPNT by integrating literature on career goal pursuit, sacrifices (or trade-offs) and need frustration. One central tenet of SDT posits that the psychological needs are universal (e.g., Chen et al., 2015; Church et al., 2013; Milyavskaya & Koestner, 2011; Ryan & Deci, 2017) and essential to thriving and flourishing (Ryan & Deci, 2017). Our findings provide further evidence for the centrality of these needs by demonstrating that, even in cases where the need frustration results from personal action (or inaction), it leads to diminished psychological and self-regulatory functioning.

The present research also introduces a new form of sacrifice – psychological need sacrifice – into the work-life balance literature, thereby connecting work-life balance research with BPNT. Our results suggest that the sacrifice of psychological needs is distinct from sacrifice of maintenance and leisure activities. Indeed, it is notable that maintenance and leisure activity sacrifices were unrelated to diminished functioning over the course of the study. In fact, participants who sacrificed their leisure activities actually made *more* progress on their career goal over the school year when controlling for psychological need sacrifice. This suggests that leisure activity sacrifice may, in some cases, be beneficial to progress toward a career goal.

Temporarily sacrificing some personal activities, such as certain hobbies, may allow students to allocate more time and effort toward their desired career goal. Perhaps leisure activity sacrifice in career goal pursuit constitutes a form of "goal shielding" whereby the pursuer protects career goal striving from unwanted distractions (e.g., hobbies, time with friends) to reduce conflicting attentional and behavioural demands (Gollwitzer & Sheeran, 2006). Critically however, sacrificing feelings of autonomy, competence, and relatedness undermined the pursuit of a career goal, as well as psychological well-being over the span of a school year. Our results suggest that, whereas an individual can recover from temporarily sacrificing maintenance activities or commitment toward hobbies, psychological need sacrifice may carry more enduring negative repercussions. Our findings thus underscore the importance of considering whether the activities that we sacrifice will also bleed into need sacrifice and thereby pose a risk for young adults' adjustment and growth.

Conceptually, psychological need sacrificing may be the negative parallel of need crafting, which has been defined as the ability to select contexts and seek the company of people who provide opportunities for need satisfaction (Ryan, Soenens & Vansteenkiste, 2019). In other words, some people may search for opportunities of improved need satisfaction (see Legault, Ray, Hudgins, Pelosi & Shannon, 2017) while others may renounce such opportunities and even behave in ways that frustrate psychological needs over time. Further research is needed to understand how environmental factors and individual differences interact to promote individuals' need crafting or need sacrificing tendencies. For example, Ryan, Soenens and Vansteenkiste (2019) have hypothesized that certain personality traits, for example, high self-critical perfectionism, may lead individuals to select contexts that confer greater risk for need frustration, such as highly evaluative and competitive contexts. It is likely that these individuals

may be more susceptible to need sacrifice given the environmental demands of their self-selected paths and the internal pressures they seek to appease. Likewise, other personality traits may buffer against adopting certain self-regulatory styles associated with need frustration. For example, trait self-control has been shown to enhance autonomous motivation and decrease controlled motivation during personal goal pursuit (Holding, Hope, Verner-Filion, & Koestner, 2019), which may protect individuals from need sacrifice.

Antecedents of Sacrificing

Across two studies, controlling factors appeared to conspire to push young people to sacrifice their needs for autonomy, competence, and relatedness in the service of reaching career goals. In other words, individuals in our study did not appear to make personal sacrifices for their career goal for "want to" reasons and instead appeared to make them for "have to" reasons. Results suggested that valuing wealth, fame, and status (i.e., extrinsic aspirations), was positively related to pursuing a career goal to minimize feelings of guilt and shame, to obtain a reward, or to avoid a punishment (i.e., controlled motivation). In turn, controlled career goal motivation affected the extent to which participants felt forced or pressured to make personal sacrifices for their career goal. This builds on SDT's Goal Contents Theory (Ryan & Deci, 2017, p. 275) which posits that the effect of intrinsic rather than extrinsic aspirations on well-being may be "a function of the regulatory basis of goal pursuits, as extrinsic goals, will, on average, tend to be less autonomously regulated than intrinsic goals". Recent studies have supported this assertion, showing that personal goals connected to more intrinsic aspirations have tended to be pursued for more autonomous reasons compared to personal goals connected to extrinsic aspirations (Sheldon, Ryan, Deci & Kasser, 2004). Future longitudinal research is needed to replicate the present findings with temporal separation of extrinsic aspirations, controlled career-goal

motives, and controlled sacrifice motives, to confirm the serial relationship of these variables. It may be that controlled career goal regulation and extrinsic aspirations are dynamically associated such that changes towards greater controlled motivation predict enhanced prioritization of extrinsic aspirations (see Hope et al, 2019 for the dynamic relationship between aspirations, motivation, need satisfaction and well-being). Interestingly, controlled motives for sacrifice were also positively related to the more "benign" sacrifices of maintenance and leisure activities. Moreover, sacrificing leisure activities appeared to facilitate career goal progress. This highlights the complex nature of controlled sacrifice in personal goal pursuit which simultaneously bolstered leisure activity sacrifice which aided career goal progress as well as enhancing psychological need sacrifice which hindered career goal progress.

Broader Reflections

Our distinction of psychological need sacrifice from the sacrifice of maintenance and leisure activities invites discussion of Maslow's hierarchy of human needs (1943). Maslow proposed a five-tier, pyramid-shaped hierarchical model of human needs. From the bottom of the hierarchy upwards, the needs are: physiological, safety, love and belonging, esteem and self-actualization. Needs lower down in the hierarchy must be satisfied before individuals can attend to needs higher up. Although a direct mapping of the different types of need sacrifices on Maslow's model is difficult, it appears likely that psychological needs represent a higher level of functioning than maintenance or leisure activities. Interestingly, recent studies have used Maslow's hierarchical model of human needs to examine whether the level of satisfaction of lower-level needs will limit the positive effects of satisfying higher level needs. The results appear to suggest that whether or not individuals are able to satisfy other lower-level needs, such

as their needs for financial and physical security, satisfying needs for autonomy, competence, relatedness uniquely relate to greater psychological well-being (Chen, Van Assche, Vansteenkiste, Soenens & Beyers, 2015; Rasskazova, Ivanova, & Sheldon, 2016). Congruent with this research, we propose that sacrificing basic psychological needs for autonomy, competence, and relatedness will have negative consequences for students pursuing important career goals, regardless of whether they make other important sacrifices to their maintenance activities (i.e., healthy eating, exercise, hygiene, and self-care) and their leisure activities (i.e., friends, family, dating, romantic relationships, hobbies, sports, and community involvement).

One can also understand psychological need sacrifice from the Motivational Theory of Life-Span Development (Heckhausen, Wrosch & Schultz, 2010; 2018). Heckhausen and colleagues (2010, p. 51) note that "individuals may develop patterns of primary control striving that reflect very high or even excessive persistence when facing insurmountable obstacles, whereas others are more amenable to disengage". To this end, Heckhausen and colleagues (2010) give the example of over control in one domain (e.g., gymnastics) as potentially compromising an individual's goal striving capacity in the future (e.g., because of skeletal injury). Likewise, psychological need sacrifice for a career goal may be an example of "excessive persistence" in goal pursuit and may lead to adverse mental health outcomes (e.g., burnout, depression) that compromise an individual's goal striving capacity in the future. Given Heckhausen and colleagues' (2010) model of optimal goal striving, it may be most adaptive for individuals' sacrificing their basic psychological needs to relinquish or re-adjust their career goal, since psychological need sacrifice increases psychological distress and undermines goal progress over time. However, switching from goal engagement to goal disengagement for goals that elicit psychological need sacrifice may be more difficult, precisely because these goals tend

to be more controlled and disengagement may pose a greater threat to self-esteem. As such, future research is needed to examine how individuals regulate goals for which they have sacrificed basic psychological needs, and whether goal disengagement reverses adverse affective outcomes such as psychological distress.

It is also interesting to consider our research from the perspective of career development theory. The social cognitive theory of career development highlights the agentic role that goals, expectancies, and feelings of self-efficacy play in determining the success of career pursuits. (Lent & Brown, 2006). The present research, however, highlights the potential for conflict between goals and basic needs and suggests that clear and specific goals that are combined with positive expectancies and high feelings of self-efficacy may still go awry if basic psychological needs are sacrificed in their pursuit. Recent work on social cognitive theory of careers has highlighted the proactive, self-managing aspects of pursuing a career (Brown & Lent, 2016). We would suggest that an important issue to consider in this new emphasis is the extent to which setting demanding career goals may elicit sacrifices to other activities that satisfy basic psychological needs.

Limitations and Future Directions

The key measure of our study, need sacrificing, was assessed in a rather limited way. A critical issue for future research would be to use a broader set of items and separate the three need sacrifices to understand the unique effects of sacrificing autonomy, competence and/or relatedness. Additional assessments of the three types of sacrifices and need frustration would have allowed us to examine their dynamic interplay. It would have also allowed us to explore the relation between leisure activity sacrifice and psychological need sacrifice. Leisure activities often are designed to satisfy relatedness, autonomy and competence needs (Nakamura &

Csikszentmihalyi, 2014) so it is plausible that the sacrifice of leisure activities precedes the experience of psychological need sacrifice. Additional limitations of our studies include the use of two North American college samples which raises questions of generalizability, and the use of a longitudinal study design, which raises questions about causality. Replications in diverse samples, incorporating mixed methods (e.g., informant reports), and experimental manipulations are needed to address these short-comings. We studied young people who were in the exploration stage of career development, but it would also be interesting to explore whether need sacrifice occurs during later phases of the career. Perhaps older adults are more careful about sacrificing their psychological needs during career goal pursuit as they shift towards valuing family life with increased age (Super, Osborne, Walsh, Brown, & Niles, 1992). Relatedly, future work should consider whether the domain in which need sacrifice occurs (e.g., work or family) moderates the negative impact of sacrificing psychological needs.

Conclusion

The current studies contribute to the SDT and basic psychological needs literature by investigating the price that young adults pay when they sacrifice psychological needs for career goal pursuit. Our findings support the centrality of basic psychological needs and how their sacrifice has detrimental effects to affective and self-regulatory functioning beyond the effects of maintenance and leisure activity sacrifices. Far from "success being determined by what you are willing to sacrifice for it", as suggested in the opening quote, this study proposes that sacrificing psychological needs interferes with goal success and comes at an emotional cost. During university years, programs designed to help students balance the demands of career goal pursuit without sacrificing psychological needs seem crucial. Educational institutions could offer students guidance that promotes autonomous regulation for career goals (see Salmela-Aro

Mutanen, Koivisto, & Vuori, 2010) and discourage the prioritization of career goal pursuit above needs for autonomy, competence and relatedness.

The road to pursuing a long-term career goal is not without trials and tribulations. People are constantly forewarned that they must be willing to make sacrifices to achieve the goals that they hold most dear. We find that these words of guidance must be interpreted with caution. While sacrificing leisure activities was associated with making greater goal progress, sacrificing basic psychological needs for autonomy, relatedness, and competence was robustly associated with reduced goal progress and increased psychological distress. Thus, when people embark on the long and arduous road towards pursuing their career goals, it is paramount that they do not sacrifice the basic psychological needs that will fuel them on this journey.

References Article 3

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Tables and Figures Article 3

Table 1

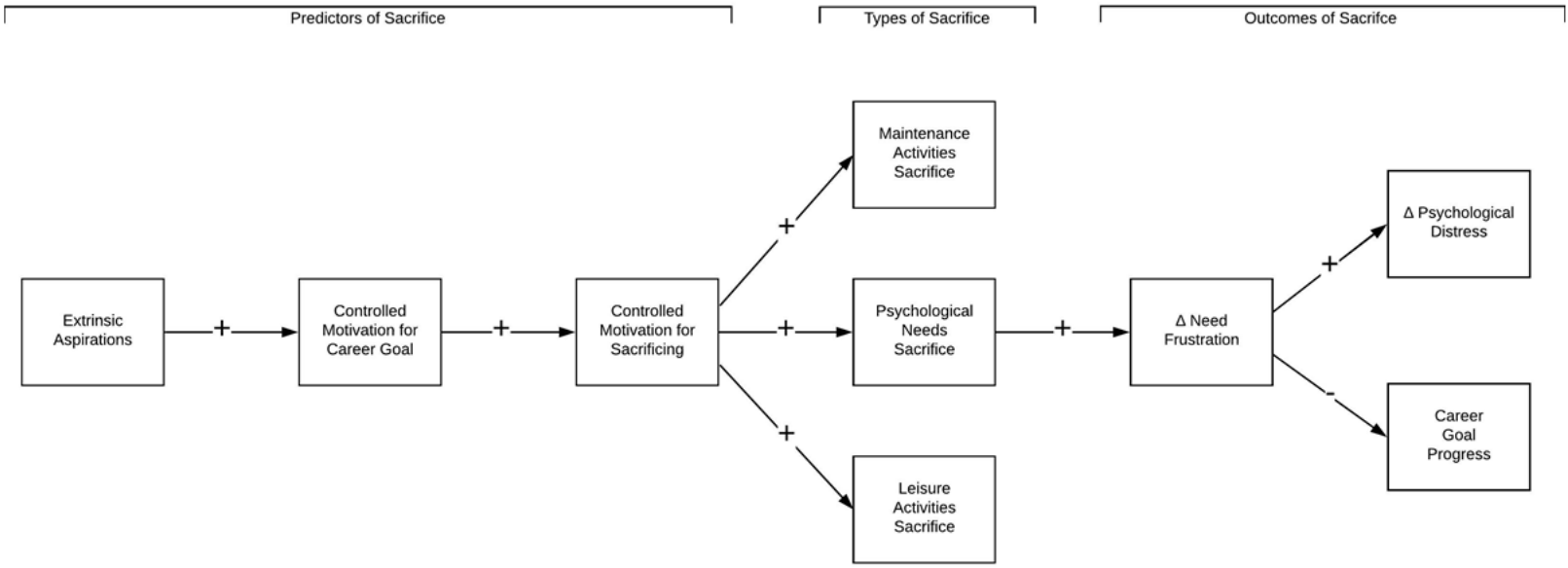
Means, Standard Deviations and Correlations of Main Variables in Sample 1 and 2.

	Variables		*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
T1	1.	Extrinsic Aspirations	4.12 (4.20)	1.14 (1.19)	—	.37***	.03	-.10	.15*	.15*	.15*	.00	.10	.07	-.14
	2.	Controlled Career Goal Motivation	3.55 (3.55)	1.09 (1.16)	.21**	—	-.05	-.19	.31***	.19**	.22**	.06	.14*	.16*	-.14*
	3.	Intrinsic Aspirations	6.25 (6.33)	0.69 (0.64)	.04	.06	—	.36**	-.09	.02	-.02	.10	-.01	.05	.08
	4.	Autonomous Career Goal Motivation	6.03 (5.99)	1.01 (0.97)	.01	-.00	.26***	—	-.36***	-.07	-.23***	.02	-.10	-.10	.23**
T2	5.	Controlled Motives for Sacrifice	40.93 (42.20)	28.99 (31.64)	.10	.30***	-.01	-.15**	—	.24**	.44***	.15*	.16*	.13	-.12
	6.	Maintenance Activity Sacrifice	3.91 (3.56)	1.41 (1.63)	.11	.13*	.06	.06	.26***	—	.57***	.78***	.11	.15	.07
	7.	Psychological Needs Sacrifice	4.10 (4.09)	1.37 (1.52)	.14*	.16**	.09	.02	.28***	.48***	—	.55***	.23**	.24***	-.10
	8.	Leisure Activity Sacrifice	4.23 (3.99)	1.42 (1.62)	.10	.09	.05	.08	.23***	.65***	.46***	—	.04	.15	.15
T3	9.	Δ Need Frustration	0.00 (0.00)	1.00 (1.00)	.11	.08	-.04	-.06	.11	.14*	.20**	.13*	—	.59***	-.19*
	10.	Δ Psychological Distress	0.00 (0.00)	1.00 (1.00)	.01	.06	-.02	-.06	.07	.13*	.18*	.12*	.66***	—	-.24**
	11.	Career Goal Progress	5.29 (4.88)	1.40 (1.60)	-.10	-.07	.09	.04	-.06	.06	-.07	.12*	-18*	-.19*	—

Note: Descriptive statistics for Sample 2 are in parenthesis; Sample 1 correlations are below the diagonal; Sample 2 correlations are above the diagonal; * $p < .05$; ** $p < .01$; *** $p < .001$.

Figure 1

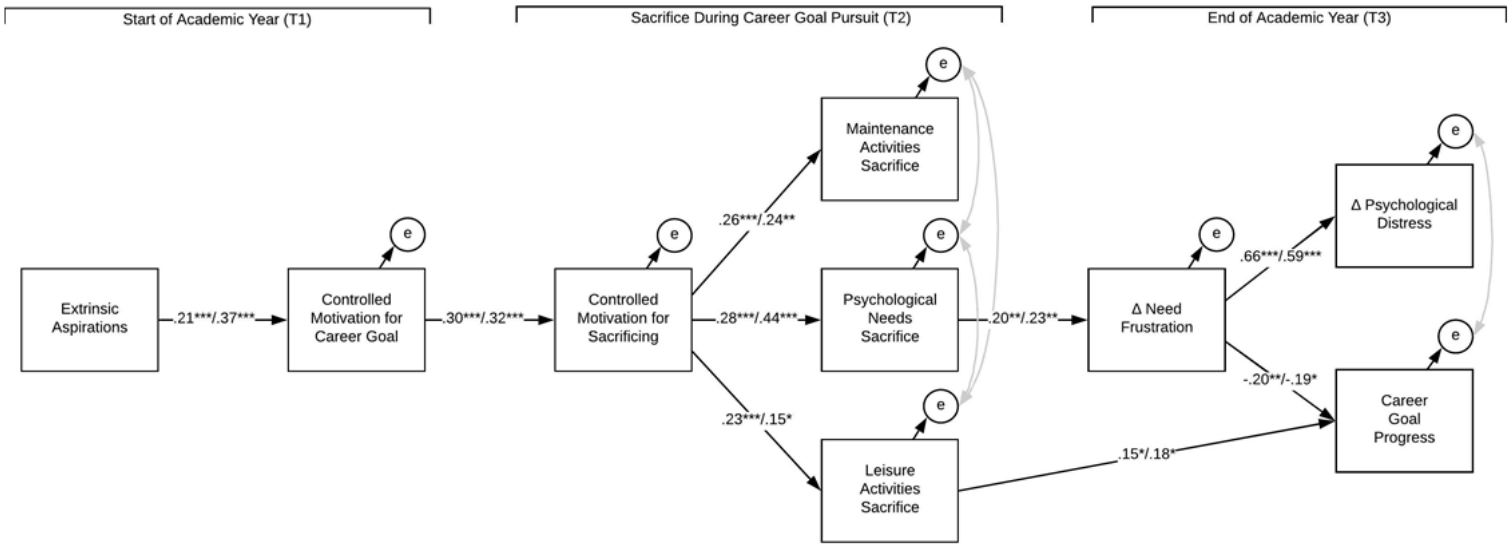
Theoretical Figure Highlighting the Associations Between Antecedents of Need Sacrifice, Types of Sacrifice, and Outcomes of Sacrificing During Goal Pursuit.



Note: The predictors of sacrificing were assessed at T1 (start of academic year), the types of sacrifice and motivation for sacrificing were assessed at T2 (middle of academic year), and the outcomes of sacrificing were measured at baseline (in the case of need frustration and psychological distress) and at T3 (end of academic year).

Figure 2

Results from Structural Equation Models Testing the Associations Between Antecedents of Need Sacrifice, Types of Sacrifice, Need Frustration, Psychological Distress, and Career Goal Progress.



Note: * $p < .05$; ** $p < .01$; *** $p < .001$, $^{+}$ $p = .06$. Numbers before the dash represent results obtained in Sample 1 and behind the dash represent results obtained in Sample 2. Covariance of the error terms between the three types of sacrifices (ranging from 0.43 to 0.78), as well as between change in psychological distress and career goal progress (ranging from -0.11 to -0.17) were included in the model for both samples, but are not depicted in the figure for visual clarity.

Appendices Article 3

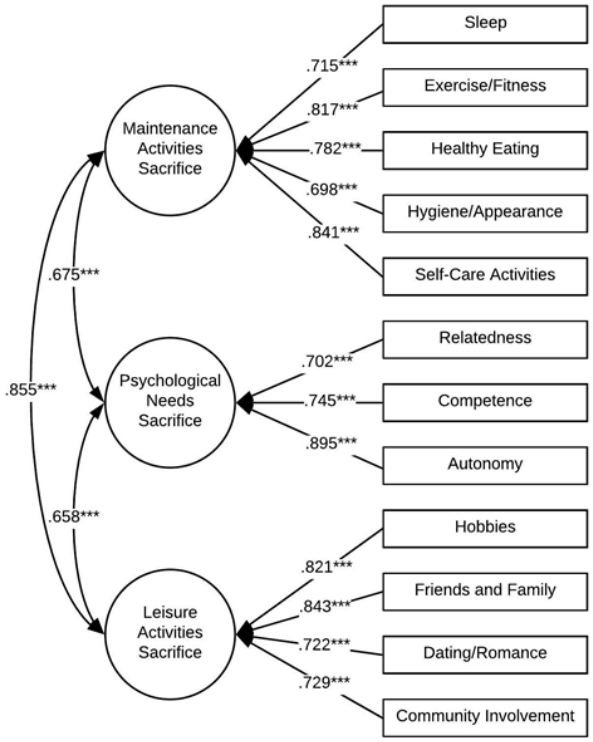
Appendix A

Final Rotated Factor Loadings for Sacrifice Items in Sample 1.

In order to pursue your career goal, how much have you had to make the following sacrifices?			
Items	Leisure	Maintenance	Psychological
Sleep	.19	**-.42**	.09
Exercise	.15	**-.59**	-.03
Healthy eating	-.17	**-.92**	.06
Hygiene/ appearance	.05	**-.65**	.02
Self-care activities	.28	**-.53**	.05
Hobbies, leisure or fun activities	**.74**	.03	.15
Friends and family	.77	.01	.07
Dating, romantic or intimate relationships	**.66**	-.08	-.06
Community involvement	**.43**	-.22	.02
Made me feel less connected to people than usual.	.17	.07	**.72**
Made me feel less competent than usual.	-.07	-.06	**.71**
Made me feel more pressured and less free than usual.	-.01	-.04	**.71**

Appendix B

Confirmatory Factor Analysis (CFA) of Three Types of Sacrifice in Sample 2.



.

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

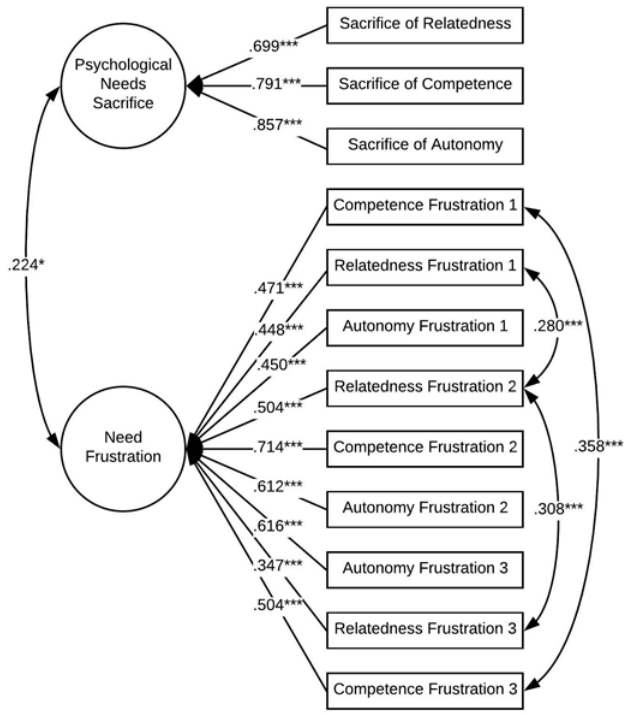
Appendix C

Final Rotated Factor Loadings for Need Frustration and Sacrifice Items in Sample 1.

Items	Need Frustration	Need Sacrifice
Made me feel less connected to people than usual.	.01	-.77
Made me feel less competent than usual.	.04	-.67
Made me feel more pressured and less free than usual.	.03	-.83
I had disagreements or conflicts with people I usually get along with.	.41	-.03
I was lonelier than I'd like to be.	.50	-.09
I felt unappreciated by one or more important people	.46	.03
I had a lot of pressures I could do without.	.54	-.06
There were people telling me what I had to do.	.49	.02
I had to do things against my will.	.38	-.04
I experienced some kind of failure, or was unable to do well at something.	.64	.06
I did something stupid that made me feel incompetent.	.59	.06
I struggled doing something I should be good at.	.69	.01

Appendix D

Confirmatory Factor Analysis (CFA) of Need Sacrifice and Need Frustration in Sample 2.



Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

Bridge to Article 4

Transitioning from a focus on the role of motivation in conflicted or demanding goal pursuit, Article 4 reports a preliminary investigation on the role of motivation in goal *disengagement*. We recruited a sample of recently retired Olympic and professional Canadian athletes to examine how their motivation for retirement impacted disengagement from their former athletic careers. While athletic retirement may limit former athletes' competitive involvement with the sport, retired athletes may still be cognitively engaged with the sport or feel conflicted and regretful about relinquishing an athletic career (Farquhar, Wrosch, Pushkar, & Li, 2013). As such, a failure to disengage may negatively impact post-retirement adaptation and well-being (Wrosch, Scheier & Miller, 2013).

In this context, we sought to offer a theoretical perspective grounded in SDT and the Motivation Theory of Life Span Development to examine whether autonomous motivation for retirement would facilitate disengagement from a former athletic career and contribute to greater subjective well-being in retirement. Given the positive role that autonomous motivation plays in goal progress and attainment (Koestner et al., 2008) we expected autonomous motivation for retirement to facilitate disengagement and promote greater well-being in retirement.

Article 4

Letting go of gold: Examining the role of autonomy in elite athletes' disengagement from their athletic careers and well-being in retirement.[5]

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Abstract Article 4

Retirement from competitive sports significantly influences former athletes' well-being. We propose that disengaging from the former athletic career is a crucial factor in retired athletes' adaptation. Using the theoretical framework of Self-Determination Theory (SDT) we propose that sport motivation at the career peak and motivation for retirement are important determinants of athletes' disengagement progress from a terminated athletic career. We also seek to examine how motivation for retirement and disengagement progress predict retired athletes' well-being. Using a mixed-retrospective/prospective longitudinal design we followed 158 government-supported elite athletes who had recently retired from an athletic career. In two online surveys administered 1.5 years apart, retired athletes reported on motivation, disengagement, and well-being. Results suggested that SDT motivation factors are important predictors for elite athlete career disengagement and well-being in retirement. The clinical implications of these findings for athletic career transition and support programs are discussed.

Keywords**:** *autonomous motivation, athletic retirement, disengagement, well-being*

Letting go of gold: Examining the role of autonomy in elite athletes' disengagement from their athletic careers and well-being in retirement.

Motivation psychologists have long asserted that "all goals are not created equal" (Ryan, Sheldon, Kasser, & Deci, 1996), highlighting how the reason(s) for goal pursuit impact goal progress, attainment, and well-being. Building upon this framework, we propose that all athletic career terminations are not created equal. Some athletes retire from an elite competitive sporting career out of their own volition, wanting, for example, to pursue further education or settle down for a family. By contrast, other athletes feel forced out of their athletic career, retiring out of a sense of pressure and control following frequent conflicts with the coach, de-selection from the national team, or painful recurring injuries. This study investigated whether athletes retiring for autonomous reasons are more likely to psychologically "let go" of their former athletic career and adjust positively to retirement, whereas athletes retiring for controlled reasons are likely to encounter difficulties distancing themselves from their athletic career and adjust poorly to retirement. While career termination is a normative and inevitable transition for athletes, it can be met with mixed adjustment outcomes such as "identity disruptions" (Lally, 2007), "career transition distress" (Taylor & Ogilvie, 2001) and decreases in well-being (Stephan, 2003). Although this adjustment does not appear to be problematic for all retiring athletes (Park, Lavallee & Tod, 2013); there is evidence that some athletes do experience serious adjustment crises when faced with retirement (Alfermann & Stambulova, 2007; Lavallee & Robinson; 2007; Stambulova, 2016; Stambulova, Alfermann, Statler, Côté, 2009,Webb, Nasco, Riley & Headrick, 1998). In the athlete retirement literature, many studies have considered the *reason* for retirement as an important predictor of adaptive transitioning. Specifically, studies have found that athletes'

sense of choice over the decision to retire is related to successful adjustment to post-athletic life (Erpič, Wylleman & Zupančič, 2004; Lally, 2007; Lavallee & Robinson, 2007; Lotysz & Short, 2004 Stambulova, 2016; Stambulova, Alfermann, Statler & Côté, 2009; Webb, Nasco, Riley & Hendrick, 1998; Wheeler, Malone, VanVlack, Nelson & Steadward, 1996). Conversely, involuntary retirement is reported to be more distressing for athletes and is associated with poorer adjustment outcomes (Webb, Nasco, Riley & Hendrick, 1998).

Nevertheless, the current literature does not offer a theoretical background grounded in motivation psychology for why retiring out of a sense of personal choice and identification is more beneficial for athletes' well-being than retiring because of internal or external pressures (Park, Lavallee & Tod, 2013). A theoretical background grounded in motivation psychology may be beneficial for the literature to integrate various findings on the subject, improve our prediction of athlete retirement outcomes, and ultimately build more effective interventions for athlete transition/support programs. Self Determination Theory (SDT) (Ryan & Deci, 2017), a macro theory of human motivation, may be helpful to address this critical gap, as SDT makes important predictions about the power of autonomous, as opposed to controlled, reasons for action on outcomes such as adaptation, well-being, and goal progress (Ryan & Deci, 2017). In this study, we sought to apply SDT's autonomous and controlled motivation constructs to understand athletes' post-retirement adaptation, by examining athletes autonomous and controlled motives for retirement as well as their autonomous and controlled motives for sport engagement.

During the retirement transition, we argue that a key process for athletes' healthy adaptation is the withdrawal of behavioral effort and psychological commitment from former athletic goal(s). This process of relinquishing effort and psychological commitment from a previously held goal is known in the field of motivation and life-span psychology as

disengagement (Wrosch, Scheier, Miller, Schulz & Carver, 2003), but has thus far not been studied in the context of athletic career termination. The present study seeks to conceptualize healthy adaptation to an athletic career termination as a form of successful disengagement. Moreover, autonomous and controlled motivation for sport engagement and retirement are used as potential determinants of athletes' disengagement progress and post-retirement well-being. As such, we seek to understand the factors that facilitate athletes' retirement and maximize their "post-sport" well-being. The clinical implications for sport transition programs and clinicians working with retiring athletes are discussed.

Athletic Retirement as Disengagement

The last two decades of research have shown that when the ideal time-frame for goal attainment has elapsed, resources needed to pursue a goal become too costly, or new life opportunities conflict with one's existing commitments, the continued pursuit of a goal is likely to erode quality of life (Heckhausen, Wrosch & Schultz, 2010; Wrosch, Scheier, Carver, & Schultz, 2003). In such circumstances, it becomes adaptive for the person to *disengage,* which means to withdraw behavioral effort and psychological commitment from the problematic pursuit (Wrosch et al. 2003b). The second self-regulatory mechanism underlying adaptive goal adjustment is goal reengagement (Wrosch et al. 2003b), which is the tendency to identify and commit to new goals when unattainable goals are confronted (Carver & Scheier, 2005). While goal disengagement frees up personal resources that can be channeled towards goal reengagement, Wrosch and colleagues (2003b) have shown that the two are independent self-regulatory processes. In the context of athletic retirement reengagement means engaging with new pursuits that do not involve the former professional athletic role.

In the athletic transition literature, the term 'disengagement' was introduced by

Koukouris (1991) to describe athlete drop-out experiences, but does not converge with the definition the term denotes in motivation psychology. Numerous studies have shown that disengagement from unattainable or elapsed goals can benefit individuals' subjective well-being (SWB), as well as their mental and physical health (Wrosch, Scheier & Miller, 2013). SWB captures people's cognitive and affective evaluations of their lives, and is composed of life satisfaction (global judgments of one's life), positive affect (the extent to which one experiences many pleasant emotions), and negative affect (the extent to which one experiences few unpleasant emotions) (Diener, 2000). SWB is considered one of the most important outcome measures in the context of studying adaptation to stressors and major life events (Luhmann, Hofmann, Eid, & Lucas, 2012) and was an outcome measure in the present study. For example, late-midlife adults who disengage from important time-framed goals, such as bearing a child or finding a romantic partner, benefit in their SWB and mental health when compared with age-matched individuals who continue to pursue these goals (Heckhausen, Wrosch & Fleeson, 2001). Researchers have even found disengaging from unattainable goals can benefit biological functioning (e.g., lower cortisol secretion, lower systemic inflammation, and fewer symptoms of illness; Miller & Wrosch, 2007; Wrosch, Miller, Scheier & De Pontet, 2007).

In the present context, we seek to conceptualize healthy adaptation to athletic retirement as a form of successful disengagement, where athletes relinquish behavioural effort and psychological commitment to their former career. Although no study to date has examined the processes of psychological disengagement in athletic retirement, this goal adjustment process has been studied in other populations of retirees (Farquhar, Wrosch, Pushkar, & Li, 2013; Gagné, Wrosch & Brun de Pontet, 2011). While the act of retirement may limit retired athletes' behavioural involvement with the former sport, it does not preclude athletes continued

psychological commitment to and identification with the former athletic career (Lavallee, Gordon & Grove, 1997). Retired athletes may still be cognitively engaged with the sport, may ruminate about past athletic experiences, or feel conflicted and regretful about relinquishing the athletic career (for regret management in retirement see Farquhar, Wrosch, Pushkar, & Li, 2013). As such, a failure to disengage may negatively impact post-retirement adaptation and well-being (Wrosch, Scheier & Miller, 2013). Several aspects of elite athletic careers may pose additional disengagement challenges for retiring athletes. Obstacles to remaining a professional athlete, such as injuries, can often be overcome through rest and rehabilitation (Podlog & Eklund, 2006), and competing psychosocial or non-athletic goals, such as settling down for a family, can be delayed (Wylleman & Rosier, 2016). Furthermore, for athletes to have reached a professional level of performance, they invested heavily in the sport, rarely disengaging from athletic goals throughout their development and careers, and were trained to persevere in the face of obstacles (Warriner, & Lavallee, 2008). As such, letting go of a career that required extensive emotional, relational, temporal, and material investment may prove even more challenging for elite athletes (Miller & Kerr, 2002). Consistent with the disengagement literature, we hypothesize that athletes' increased disengagement would be associated with increased SWB in retirement.

The Organismic Integration Theory and Motivation for Retirement

The Organismic Integration Theory (OIT) of goal striving (Ryan & Deci, 2017), developed as mini theory of SDT (Ryan & Deci, 2017), focuses on the quality of motivation underlying behavior. Researchers distinguish between predominately autonomous and predominately controlled motives, although both forms of motivation tend to co-occur to different degrees in most complex behaviors (Ryan & Deci, 2017). Autonomous motivation is characterized by a feeling of choice and volition, and describes partially or fully internalized

reasons for enacting a behavior, such as inherent interest and enjoyment (*intrinsic motivation*), because one believes the behavior to be meaningful and important (*identified motivation*) or because it truly represents personal values and interests (*integrated motivation*). Autonomous motivation has been robustly linked to sustained goal effort (Sheldon & Elliot, 1998; Sheldon & Houser-Marko, 2001), increased goal progress (Holding, Hope, Harvey, Jetten & Koestner, 2016; Koestner, Otis, Powers, Pelletier & Gagnon, 2008) and increased goal attainment (Sheldon & Houser-Marko, 2001; Smith, Ntoumanis, Duda and Vansteenkiste, 2011).

Conversely, controlled motivation subsumes the two least internalized forms of motivation: enacting a behavior in response to external contingencies, such as the expectation of reward or punishment (*external motive*), or of internal feelings of obligation and pressure (*introjected motive*). Controlled motivation has shown weak relationships with goal progress and attainment outcomes (Koestner et al., 2008; Smith, Ntoumanis, Duda and Vansteenkiste, 2011).

In the context of athletic retirement, two motivational processes may be important for predicting athletes' disengagement and well-being (1) athletes autonomous and controlled motives for retirement, as well as (2) athletes' autonomous and controlled motives for engaging with the sport prior to retirement. Numerous studies demonstrate that athletes who retired voluntarily and planned their retirement in advance felt higher perceived control over the retirement process, faring better than retirees who felt pressured or controlled into retirement (Taylor & Ogilvie, 2001; Webb, Nasco, Riley, & Headrick, 1998). A recent systematic review of 126 studies examining athletes' career transition out of sport from 1968 until 2010 identified fifteen factors that have been associated with athletes' career transition adjustment (Park, Lavallee & Tod, 2013). Notably, the "voluntariness of the retirement decision", defined as the degree of control athletes have over their decision to retire, was a factor examined in 21 studies

included by Park et al. (2013) in the review. Park and colleagues (2013) found that 18 of these studies reported a positive association between voluntariness of the retirement decision and the quality of career transition.

Although Park et al.'s (2013) study was not contextualized using OIT, it appears that many of the fifteen factors that Park and colleagues (2013) identified as being important in the prediction of athletes' career transition adjustment can be understood in terms of autonomous or controlled motives for retirement. For example, athletes' interest in "career/personal development" showed positive associations with the quality of their transition (Park et al. 2013) and can be understood as an autonomous motive for retirement. Conversely, factors such as "health problems/injuries" and "poor relationship with coach" were sources of career transition difficulties (Park et al. 2013) and could be subsumed under controlled motives for retirement: in both circumstances, external pressures and contingencies motivated the decision to retire. As such, many of the independent factors previously associated with positive or negative post-retirement outcomes can be organized into OIT's theoretical framework of autonomous and controlled motives. We predict that holding more autonomous motives for retirement will facilitate the disengagement process and increased SWB, whereas holding more controlled motives will hinder progress of disengagement, with negative consequences for SWB.

Beyond examining the motives for retirement in predicting athletes' disengagement and post-retirement SWB, it may also be important to consider athletes' motivation for engaging with the sport prior to retirement. Recent work in the SDT framework has also begun to uncover how motivation for goal pursuit predicts how athletes will respond when confronted with unattainable goals. For example, Smith and Ntoumanis (2014) examined university athletes who were asked to imagine a season-length sport goal becoming unattainable. These researchers found that

autonomous motives for the sports goal were negatively associated with participants' willingness to disengage from the goal in the hypothetical scenario of goal unattainability. Ntoumanis, Healy, Sedikides, Smith and Duda (2014) extended these findings with laboratory study measuring athletes' autonomous and controlled motivation for attaining an 8-minute cycling goal, and manipulated the attainability of this goal on a cycling ergometer. Ntoumanis et al. (2014) found that athletes' autonomous motivation for the cycling goal negatively predicted cognitive ease of disengagement from this goal (i.e. participants found it difficult to stop thinking about the cycling goal and let it go following the task). These studies underline the importance of assessing motivation for goal engagement when predicting ease of disengagement.

The Present Study

The present study aimed to shed light on the predictive effects of autonomous and controlled motivation (for sport engagement and retirement) on disengagement from a terminated athletic career by studying recently retired elite athletes. Specifically, we examined how retired elite athletes' motivation for sport engagement at career peak, and motivation for retirement, both affected athletes' disengagement progress post-retirement. In turn, we sought to examine how athletes' disengagement progress predicted their well-being post-retirement.

Our first hypothesis was that athletes' SWB would fluctuate as a function of their retirement stage: that athletes' SWB would decrease immediately following retirement and make a recovery in later stages of the retirement process. Consistent with the goal adjustment literature (e.g. Wrosch, Scheier & Miller, 2013), we also hypothesized that disengagement progress from the terminated athletic career would increase over time and would be positively associated with well-being in retirement.

Given the literature review by Park et al. (2013) we hypothesized that autonomous

motivation for retirement would both be associated with greater goal disengagement and greater well-being in retirement. Additionally, we wanted to explore whether motives underlying retirement would have incremental predictive validity beyond the motives underlying athletes' sport engagement at their career peak. We had no clear hypothesis for how motivation for sport engagement (autonomous vs. controlled) during athletes' career peak would influence their disengagement progress in retirement. Because autonomously endorsed activities represent a person's values and enduring interests, letting go of an autonomously endorsed sporting career might be difficult for athletes, resulting in decreased disengagement. On the other hand, the feeling of choice and volition associated with autonomous sport engagement might give rise to a more flexible approach when engagement with the sport becomes problematic or unattainable, thus facilitating goal disengagement.

Methods

Participants

We recruited 158 government-supported Canadian athletes to participate in this study (61% female; 85% Anglophone; 15% Francophone; *X* age = 30.56 years, *SD* = 5.88 years). These high-performance athletes were associated with the Athlete Assistance Program (AAP), a Canadian funding program under Sport Canada which financially supports athletes with potential to achieve top 16 results at international sporting. In our sample, 86.1% reported having competed in an Olympic sport, 9.5% reported having competed in a Paralympic sport, and 4.4 % reported having competed in a non-Olympic sport. At their highest level of competition, 65.6% of the sample reported having been carded by the AAP with the "Senior International Card" (the highest level of funding for athletes expected to compete at an Olympic, Paralympic or international championship), 16.6% with the "Senior National Card" (for athletes expected to

compete at a national level), and finally, 17.8% were carded with the "Development Card" (for athletes training to compete on a national level). Athletes reported having competed in their sport prior to retirement for an average of 15.58 years (SD= 6.08 years). The first survey of this study was administered in 2014. As only a small handful of elite athletes retire in a given year, and most retire following Olympic Games, we recruited athletes that had retired between 2008 and 2014 allowing us to capture retirees following two summer and two winter Olympic Games. The majority of the sample (58%) retired between 2012 and 2014. On average, athletes reported having retired 2.55 years (*SD* = 1.64) before participating in our study. Athletes were also asked if they agreed to be contacted for a follow-up study which was sent to 150 participants (94.9% of the original sample) 1.5 years after the initial survey. Of this sub-sample, 63% (N= 94) participated in the second part of the study.

Procedure

Through collaboration with the Canadian Sport Institute's Elite Athlete Transition Program (EATP), we contacted retired athletes via email. The email provided the prospective participants with information about the study, and allowed participants to access an online link where they were presented with a consent form. This study was approved by the University ethics board (REB file #332-0114), and participants gave written consent before participating. Two native Francophone speakers with academic backgrounds in psychology translated and back-translated the recruitment material and surveys from English to French. Preliminary analyses revealed no differences in the means of the outcome variables as a function of the survey language. Participants were compensated for their participation with $10 online gift cards for iTunes or Amazon.

In total, four time points in athletes' lives were assessed; three time points in the first survey and one time point in the follow-up survey. The four time points represented the peak of athletes' career (T1), two months post-retirement (T2), approximately two years following retirement (T3) and approximately 3.5 years following retirement (T4). Because all athletes in our sample had already retired, the T1 and T2 assessments were retrospective. We sought to minimize participants' recall bias and enhance the validity of participants' retrospective information recall by instructing participants to think back to their former selves and write a small paragraph describing themselves and how they felt about the sport at each time point, before answering survey questions related to that time point. This priming technique was also used in T3 in which participants were asked to write a short paragraph describing themselves in the present.

General demographic information was assessed prior to the priming sections. Athletes reported on their SWB at all four time points. At T1 athletes reported on their motivation for sport engagement. At T2 participants were asked about their specific reasons for retirement and their motivation for retirement. At T3 and T4 participants reported on disengagement from their former competitive sport and reengagement with new pursuits.

Measures

Subjective Well Being (SWB). We employed the Mood Report (Emmons & Diener, 1985) to assess the emotional component of SWB. For each item, participants rated the extent to which they experienced a specific emotion on a 7-point Likert scale ranging from "not at all" (1) to "extremely" (7). The scale consists of nine items, four describing positive affect (e.g., joyful, happy) and five describing negative affect (e.g., anxious, worried). The five-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985) was employed to assess the

cognitive component of SWB. Participants rated the extent to which they agreed with statements regarding how satisfied they felt about the current conditions in their life on a 7-point Likert scale ranging from “not at all true” (1) to “very true” (7). A composite index of SWB was calculated with the mean standardized scores of positive affect, reversed negative affect, and satisfaction with life at all four time points.

Motivation for Sport. At T1 participants completed a 10-item abbreviated version of the Sport Motivation Scale (SMS) (Pelletier, Fortier, Vallerand, Brière, Tuson & Blais, 1995). While the SMS differentiates between intrinsic and extrinsic motivation, we sought to use these items to distinguish between autonomous and controlled motivation. Participants responded to the prompt “Why did you practise your sport?”. Participants rated items on a 7-point Likert scale ranging from “does not correspond at all” (1) to “corresponds exactly” (7). The abbreviated measure included six items measuring autonomous motivation, and four items measuring controlled motivation. The items measuring autonomous motivation included items that measured the three subtypes of intrinsic motivation “to know” (e.g. “For the pleasure that I felt while learning training techniques that I had never tried before.”), “to experience stimulation” (e.g. “For the excitement I felt when I was involved in the activity.”) and “to accomplish” (e.g. “For the satisfaction I experienced while I was perfecting my abilities.”) as well as identified motivation (e.g. “Because it was one of the best ways to maintain good relationships with my friends.”). We calculated the mean of these six items to compute autonomous motivation for sport. The four items measuring controlled motivation included three items that measured external regulation (e.g. “For the prestige of being an athlete.”; “To show others how good I was at my sport.”; “Because it allowed me to be well regarded by people that I know.”) as well as introjected motivation (e.g. “Because I would feel bad if I was not taking time to practise.”).

Reliability was good with Cronbach α's of .76 for autonomous motivation and .73 for controlled motivation.

The Goal Adjustment Scale. The Goal Adjustment Scale was adapted from Wrosch et al. (2003b) to capture athlete's disengagement from goals related to their athletic careers and reengagement with new pursuits. Four statements assessed athletes' disengagement from their athletic careers. Consistent with Wrosch et al. (2003b), two items were related to the "effort" component of goal disengagement (e.g., "It's easy for me to reduce my effort toward the goal of becoming a professional athlete"), while two statements were related to the "commitment" component of goal disengagement (e.g., "I stayed committed to the goal of becoming a professional athlete for a long time; I can't let it go"). Participants rated items on a 7-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7). Successful goal reengagement was measured by six statements reflecting initiation of alternative goal pursuit (e.g. "I seek other meaningful goals" and "I tell myself that I have a number of other new goals to draw on."). This scale was administered at T3 and T4. Reliability was excellent with Cronbach α's of .84 for both disengagement and reengagement.

Motivation for Retirement. Participants rated their motivation for retirement with two slider scale questions, ranging from "0 - not at all", to "100 - completely". The first question assessed the degree to which the participant felt autonomous about their decision to retire ("How much did you feel it was your own choice/desire to retire from your sport?"). The second question assessed the degree to which the participant felt controlled in their decision to retire ("How much did you feel pressured and compelled to retire from your sport?"). These measures were significantly negatively correlated with a Pearson correlation ($r(136) = -.47$, $p < .001$).

Reasons for retirement. We assessed athletes' reasons for retirement by asking participants to select as many reasons as applied to their circumstance from a 15-item list supplied to us by the AAP. Six of these reasons reflected autonomous reasons for retirement (e.g., "I wanted to pursue an alternative career" or "I achieved my sport related goals"). The remaining nine reasons participants could select from represented controlled reasons for retirement (e.g., "Injury" or "I was not selected on the national team").

Results

Analytic Strategy

We conducted all analyses in SPSS 23. We conducted some preliminary correlational analyses to understand the association between athletes' reasons for retirement and their motivation to retire. We hypothesized that reasons reflecting athletes' choice, agency and interest would positively correlate to autonomous motivation for retirement, whereas reasons reflecting pressure and conflict would positively correlate with controlled motivation for retirement. We also describe the correlations between the key variables of the study. Next, we conducted some preliminary analyses with the aim of informing the reader about the evolution of the key variables (SWB, disengagement, reengagement) throughout the study, via a repeated-measures within-subjects ANOVA and paired samples t-tests. For our main research questions, (1) the extent to which motivational factors impacted athletes' disengagement progress, and (2) the extent to which motivational factors and disengagement progress impacted athletes' SWB, we used hierarchal multiple regression analyses.

Preliminary analyses

Association of reasons for retirement with retirement motivation. From the 15 available items to choose from, athletes selected between 1 and 10 reasons for retirement

(*M*= 3.68, *SD*= 1.79). In line with our expectations, our measure of autonomous motivation for retirement was positively correlated, using Pearson's correlation, with items reflecting athletes' choice, agency and interest, such as "wanting to pursue an alternative career" ($r\ (154) = .34$, $p < .001$), "achieving athletic career objectives" ($r\ (154) = .34$, $p < .001$), "no longer being interested in competing" ($r\ (154) = .33$, $p < 0.001$), and "wanting to pursue education" ($r\ (154) = .21$, $p = .009$), while autonomous motivation was negatively associated with items such as "not being selected for the national team" ($r\ (154) = -.23$, $p = .004$) and "injury"($r\ (154) = -.36$, $p < .001$). Conversely, our measure of controlled motivation for retirement was positively correlated with items reflecting conflict and tension such as "difficulties with my coach/staff" ($r\ (139) = .31$, $p < .001$) and "experiencing discrimination" ($r\ (139) = .21$, $p = .015$), while being negatively associated with more autonomous reasons such as "no longer being interested in competing" ($r\ (139) = -.31$, $p < .001$) and "achieving athletic career objectives" ($r\ (139) = -.17$, $p = .046$).

Associations between key variables. Table 1 depicts the correlations between athletes' motivation for sport engagement, motivation for retirement, and athletes' disengagement progress over time. Athletes' autonomous motivation for sport engagement and athletes' autonomous motivation for retirement were both positively related to T3 disengagement progress. Conversely, athletes' controlled motivation for sport engagement and controlled motivation for retirement were both negatively related to T3 disengagement progress. Importantly, neither autonomous nor controlled motivation for sport engagement was associated with autonomous or controlled motivation for retirement. Table 1 also shows that autonomous motivation for retirement was positively associated with SWB at T2 and T3, indicating that

athletes who felt more autonomous in their motivation for retiring tended to report higher SWB in retirement.

Changes in key variables over time. These analyses are included to orient the reader to the trajectories of athletes' SWB, disengagement, and reengagement progress over the course of their retirement. Using paired samples t-tests we analyzed the change in athletes' disengagement and reengagement progress from T3 to T4. Over the 1.5-year follow-up (T4), athletes continued to make disengagement progress (M = 5.45, SD = 1.39) (t (1, 91) = -4.20, $p < .001$). However, athletes did not differ significantly in their T3 reengagement progress, (M = 5.87, SD = 0.97) and T4 (M = 5.92, SD = 0.82) which was judged to be at a high level at T3. A repeated measures ANOVA was conducted to examine how athletes' SWB fluctuated throughout retirement, with time period used as a within-subjects factor with four levels (T1, T2, T3, and T4). We conducted Mauchly's Test of Sphericity and found that the assumption of sphericity had been violated $X^2(5) = 29.89$, $p < .001$, which is common in repeated measures designs (O'Brien & Kaiser, 1985). Since the violation of sphericity increases the risk of a Type I error, we applied a Greenhouse-Geisser correction in our analysis. A repeated measures ANOVA with a Greenhouse-Geisser correction determined that SWB differed significantly between the four time-points F (2.48, 227.96) = 24.76, $p < .001$. Post-hoc tests using the Bonferroni correction to decrease the risk of Type 1 errors revealed that athletes generally reported high levels of SWB at the peak of their athletic careers (T1) followed by a significant decrease 2 months post-retirement (T2) (M = 5.60, SD =.10 vs. M = 4.47, SD = .16, respectively). This decrease in SWB was recovered at the later stages athletes of retirement (T3) (M = 5.37, SD = .12) and (T4) (M = 5.20, SD = .11).

Main results

Motivational factors influencing disengagement from athletic career. To answer our first question regarding the motivational factors implicated in athletic career disengagement we examined athletes' autonomous and controlled motivation for sport engagement at their career-peak, as well as their autonomous and controlled motivation for retirement, to predict disengagement progress approximately 2 years after retirement (T3). We conducted a two-step hierarchical regression entering athletes' autonomous and controlled motivation for sport engagement in the first step and athletes' autonomous and controlled motivation for retirement in the second step. At the first step, athletes' autonomous motivation for sport engagement was associated with increased disengagement progress (β = .24, t = 2.77, p = 0.006) whereas controlled motivation was associated with decreased disengagement progress (β = -.22, t = -2.52, p = 0.013). This step accounted for 8% of the variance in T3 disengagement progress (F(2, 130) = 5.66, p = 0.004). At the second step, athletes' autonomous motivation for retirement also emerged as a significant predictor of disengagement progress (β = .25, t = 2.73, p = 0.007) while controlled motivation for retirement was non-significant (β = -.06, t = -.67, p = 0.51), predicting an additional 8% of the variance in disengagement progress (F(4, 128) = 6.06, p < .001). In total, this model accounted for 16% of the variance in athletes' disengagement progress at T3. We then repeated the same analysis with T4 disengagement progress entered as the dependent variable. Approximately 3.5 years post-retirement, only autonomous motivation for retirement was associated with increased disengagement progress (β = .37, t = 3.28, p = 0.002), accounting for 12.4% of the variance in T4 disengagement progress (F(4, 75) = 2.65, p = 0.04).

Psychological processes and SWB over time. After establishing that autonomous motivation for retirement predicted the largest variance in athletes' disengagement progress, we next sought to examine the effects of motivation for retirement and disengagement progress on

athletes' SWB. Because motivation for retirement and disengagement progress were both related to SWB we conducted a hierarchical regression to predict athletes SWB approximately 2 years post-retirement (T3). We entered athletes' baseline SWB and years since retirement in the first step of the regression to control for participant differences in baseline well-being as well as differences in the latency between participants' retirement and survey completion. We entered autonomous motivation for retirement in the second step of the regression, and athletes T3 disengagement progress at the third step of the regression. At the first step, athletes' time since retirement (β = .18, t = 2.26, p = 0.02) and baseline SWB (β = .20, t = 2.51, p =0.01) were both significant predictors of T3 SWB accounting for 7.7% of the variance (F(2, 142) = 5.92, p = 0.003). At the second step of the regression, athletes' autonomous motivation for retirement also predicted T3 SWB (β = .23, t = 2.79, p =0.006) explaining an additional 4.8% of the variance in athletes' SWB (F(3, 141) = 6.73, p =0.006). Finally, at the third step, athletes' T3 disengagement progress was entered in the regression (β = .23, t = 2.76, p = 0.006), predicting an additional 4.5% of the variance in athletes' SWB (F(4, 140) = 7.19, p = 0.006). In total, this model accounted for 17% of the variance in athletes' SWB. As such, these findings suggest that autonomous motivation for retirement and disengagement progress are both important factors in determining athletes' post-retirement well-being. The same analysis was conducted with T4 SWB as the dependent variable. Only baseline SWB (β = .37, t = 3.67, p < 0.001) and athletes' T3 disengagement progress (β = .24, t = 2.29 p = 0.024) significantly accounted for athletes' well-being approximately 3.5 years post-retirement.

Discussion

The primary objectives of the present study were (1) to conceptualize the transition into athletic retirement as a form of disengagement, (2) introduce SDT motivation factors as

important predictors for successful disengagement from a terminated athletic career, (3) examine how autonomous motivation for retirement and disengagement progress impacted athletes' SWB in retirement.

As expected, athletes' SWB fluctuated as a function of their retirement stage: while SWB decreased following retirement, athletes recovered in their SWB close to baseline levels approximately 2 and 3.5 years following retirement. Over this time period athletes continued to disengage from their terminated athletic career as evidenced by the samples' increased average disengagement levels at the 1.5 year follow-up. Consistent with the disengagement literature, athletes' disengagement progress was positively associated with their SWB at all retirement measurement points. As such, the disengagement process unfolded over several years, highlighting the positive impact of disengagement on well-being, as well as difficulty of relinquishing psychological commitment from a powerful career and role. Conversely, we found no differences in mean athlete reengagement in our follow-up survey, suggesting that athletes' reengagement efforts had already plateaued at the time of the first survey administration. This finding was not surprising given the information we obtained about the "reengagement support" athletes receive through Sport Canada's transition program (EATP). At the time our study was conducted, the Canadian EATP had devoted considerable resources towards helping athletes plan their future by ensuring that retired athletes had goals and career plans following retirement. One speculative explanation for the high reengagement scores may be that our sample was well-prepared by the EATP for this component of retirement, although we do not have data to support this claim. Nevertheless, preparing athletes to psychologically disengage from their former athletic career was not part of Sport Canada's transition program, and is currently not a component of any athlete transition program to the authors' best knowledge. This has important

implications for sport transition programs and clinicians that may be focusing heavily on helping athletes reengage with new goals post-retirement without sufficiently guiding athletes towards psychological disengagement from their former athletic pursuits. We address the possibility of including disengagement interventions in athlete transition programs later in the discussion section.

The results of this study uncovered two factors facilitating disengagement: athletes' autonomous sport motivation at their career peak and athletes' autonomous motives for retirement. Firstly, we found that athletes who felt more autonomous about engaging with their sport at their career peak tended to experience greater disengagement progress in retirement, while athletes who felt controlled about engaging with their sport at their career peak tended to have more difficulty disengaging. No study to date as examined the effect of motivation for sport engagement on disengagement progress in retirement. The most conceptually similar work that has been conducted would suggest that autonomous motivation for goal engagement can negatively impact the ease of goal disengagement (e.g., Smith & Ntoumanis, 2014; Ntoumanis et al., 2014). However, both the scope of the goals examined (e.g., imagining unattainability of season length goal; 8-minute cycling goal on ergometer) as well as the samples studied (e.g., student athletes training for approximately three hours per week) are too dissimilar to draw generalizable conclusions. Furthermore, athletic career termination is a decision with identity-relevant implications, which highlights another important distinction between our study and the previous studies. One interpretation may be the self-concordant, integrated motivation athletes experienced at their career peak helped athletes regulate disengagement with greater ease, flexibility, and openness, once confronted with the reality of retirement. Conversely, athletes who felt controlled about their sport at their career peak demonstrated less disengagement

progress in retirement. As Sheldon (2014, p.355) wrote: "…pursuing non-concordant [i.e., non-autonomous] goals is risky; people are more likely to give up or fail to achieve such goals, and when they do achieve the goals, they may fail to benefit from such achievement". In our sample, the athletes who felt predominately controlled about sport engagement at their career peak may still be grappling with the same controlling forces of external rewards, social approval or feelings of guilt/pressure in retirement. In other words, athletes who used their competitive sporting career as a vehicle to seek external approval or appease internal ego demands may continue to feel subjugated to these demands even when the time-frame to pursue an athletic career has elapsed, leading to poorer disengagement. Future prospective longitudinal studies surveying athletes prior to retirement are needed to replicate this finding and tease apart the mechanisms at play.

A second factor facilitating athletes' disengagement was their autonomous motivation for retirement. While previous research has highlighted the importance of voluntariness in athletes' retirement decision when predicting the quality of the career transition (for a review see Park, Lavallee & Tod, 2013), the present study considered athletes' motives for retirement under the theoretical framework of OIT by distinguishing between autonomous and controlled reasons for retirement. As expected, athletes who felt greater autonomous motivation about retirement tended to make more disengagement approximately two years following retirement.

Clinical Implications for Sport Transition Programs

Results of our study suggest that disengagement progress had important implications for athletes' well-being in retirement. Importantly, this study assessed two novel predictors, athletes' autonomous motivation for retirement and athletes' disengagement progress, in determining athletes' SWB post-retirement. Our results showed that autonomous motivation for retirement,

and disengagement progress from the terminated athletic career were both associated with elite athletes' increased well-being approximately two years post-retirement. This finding has the potential to enhance athlete transition and support programs that aim to maximize athlete SWB post-retirement. By assessing athletes' motivation for retirement, transition programs are likely to identify athletes that experience few autonomous reasons for retirement and/or predominantly controlled reasons for retirement. Once identified, these athletes may benefit from autonomy enhancing interventions designed to help athletes internalise their motivation for retirement. These interventions could, for example, validate athletes' emotional responses about retirement, explore athletes' attitudes about retirement, and help athletes generate autonomous reasons for why retirement may be in their best interest or congruent with other life values. Importantly, results from this study suggest that holding autonomous motives for retirement will facilitate athletes' disengagement from their terminated athletic career. Autonomy enhancing interventions have proven successful in other domains of lifestyle disengagement, such as smoking cessation (Williams et al., 2006). Indeed, in a smoking cessation study by Williams and colleagues (2006), counselors of the intervention group focused understanding quitters' perspectives and emotional responses about quitting smoking, as well as exploring quitters' attitudes about why they liked smoking. Follow-up visits for those who had not wanted to quit smoking involved counselors' reviewing the participants' values and initiating a discussion about any further thoughts on trying to quit (Williams et al., 2006). Athletes nearing retirement might also benefit from psychoeducation about the importance of psychological disengagement and work collaboratively with sport psychologists to identify strategies that will help them "let go". Such strategies may include avoiding self-blame and attributing perceived negative outcomes to causes outside the self (Wrosch, Bauer, Miller & Lupien, 2007).

Theoretical Implications

Finally, the research presented in this study may have implications for predicting successful disengagement outside of the domain of athletic retirement. Thus far, researchers in the field of lifespan motivation have largely considered individual difference measures as predictors of goal disengagement (Heckhausen & Wrosch, 2016). For example, individuals' goal disengagement capacity, which refers to individuals' general tendencies to withdraw effort and commitment from the pursuit of unattainable goals across different domains, has been robustly linked to increased disengagement progress (Wrosch, et al, 2013b). This study is the first to suggest that individuals' disengagement progress may also be impacted by both their motivation for engagement, as well as their motivation for disengagement. As such, it may be important for the field to look beyond broad individual difference measures when predicting disengagement progress, and to start considering motivational factors that are specific to the goal or network of goals that the individual intends to disengage from.

Limitations and Future Directions

Despite the contribution of the present research to our understanding of athletes' disengagement from a terminated athletic career, it is important to underscore the limitations of this study. While we used longitudinal data to follow-up retired elite athletes 1.5 years after their initial participation, a major limitation of this study was the use of retrospective data for the first two time points of the study. We sought to minimize participants' memory bias and enhance the validity of retrospective information recall by priming athletes with writing exercises prior to the completion of questionnaires targeting distinct phases of their transition. However, the design issues of our study limit the interpretability of our results. For example, due to the concurrent measurement of motivation to retire and disengagement progress, we cannot exclude the

possibility that athletes further along in the disengagement process reconstructed their retirement experience in a way that allowed them to perceive greater retrospective autonomy in their retirement decision. In fact, an additional benefit of successful disengagement may be the enhanced perception of personal volition and integration when looking back on important life decisions, which is an interesting research question unto itself. Nonetheless, the cross-sectional nature of the first three measurement points weakens claims of directionality and may have biased participant responding. The short-comings of our study design also limited our analytical decisions, as more sophisticated analyses, such as mediation analyses, are not warranted on cross-sectional data (Cole & Maxwell, 2003; Maxwell & Cole, 2007). Clearly, future studies are needed to replicate the present findings with fully prospective longitudinal data that assesses elite athletes prior to retirement as well as experimental data that can fully address the directionality of effects.

Our longitudinal follow-up data demonstrated that athletes continued to disengage over the 1.5-year follow-up period, and that athletes' disengagement progress was still positively related to their SWB at this later time. None the less, the effects of our second regression model of autonomous motivation for retirement predicting SWB was no longer significant when T4 SWB was entered as the dependent variable. It may be that our T4 follow-up sample was too small to capture the effects of motivation to retire on SWB approximately 3.5 years since athletes retired. The reliance on self-report measures in this study represents a further limitation, even though the use of self-reports is consistent with prior disengagement and motivation research (e.g. Sheldon & Elliot, 1998; Wrosch et al., 2003b).

While the present study focused on the application of OIT as a framework for understanding the motivation underlying athletic career termination, Basic Psychological Needs

Theory (BPNT) is another important SDT mini-theory of relevance for understanding athletes' retirement decision and outcomes. BPNT highlights how the needs of competence, relatedness, and autonomy are central to human wellness, development, and thriving (Ryan & Deci, 2017). The need for autonomy is about experiencing choice and volition in one's behavior and endorsing actions as consistent with one's interests, values, or beliefs. The need for competence refers to feelings of effectiveness and mastery in one's environment, and the need for relatedness involves feeling close and meaningfully connected the people in one's environment. In sport research, numerous studies have linked basic needs satisfaction with indicators of adaptive functioning, such as increased well-being (Gagné, Ryan, & Bargmann, 2003), persistence (Sarrazin, Vallerand, Guillet, Pelletier & Cury, 2002), and protection from burnout experiences (Perreault, Gaudreau, Lapointe and Lacroix, 2007). Meanwhile psychological need thwarting in sport is more pernicious than the absence of need satisfaction (Gunnell, Crocker, Wilson, Mack, & Zumbo, 2013), and is associated with a host of maladaptive outcomes (i.e. disordered eating, depression, negative affect and physical symptoms, for a review see Bartholomew, Ntoumanis, and Thøgersen-Ntoumani, 2011). Future research would benefit from including assessments of psychological need satisfaction and thwarting prior and subsequent to retirement. Not only would psychological need satisfaction be an excellent outcome measure to capture athletes' post-retirement adaptation, but measuring need satisfaction (and thwarting) would also allow researchers to understand the relationship between psychological need satisfaction during their career and how that impacted athletes' motivation to retire, their disengagement progress, and post-career goal reengagement. In turn, it is likely that athletes' disengagement and reengagement may enhancing feelings of autonomy, competence and relatedness (Sheldon & Elliott, 1999).

Assessing basic psychological needs would also fit with the recently developed *holistic ecological perspective* in athletic career research, which emphasizes the "athletic career as a social affair" (Henriksen, Larsen, & Christensen, 2014) and shifts the researchers' focus from an individual athlete to the environment the athlete belongs to. As such, understanding the dynamic interplay between athletes' need satisfaction/thwarting and their motivation for retirement, disengagement, and reengagement, will add value to future clinical interventions and build theoretical bridges between OIT, BPNT, and Goal Adjustment theory.

Conclusion

In conclusion, this paper explored novel motivational antecedents of disengagement from a terminated athletic career grounded in SDT. This study highlights the need for transition and support programs to balance the predominant focus on "what's next" (reengagement) and take more time to process "what was there" (motivation for sport engagement and retirement). While these findings require replication with an improved study design, they have the potential to make important applied contributions athlete transition programs as well as furthering the field of disengagement research.

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Tables Article 4

Table 1

Means, standard deviations and correlations between the major study variables.

	$\bar{x}$ / *s*	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. T1 autonomous sport motivation	5.88 (.97)	X								
2. T1 controlled sport motivation	4.51 (1.27)	.26**	X							
3. T2 autonomous motivation for retirement	71.68 (32.58)	.01	-.09	X						
4. T2 controlled motivation for retirement	36.62 (35.05)	-.11	.02	-.47**	X					
5. T3 Disengagement	4.70 (1.51)	.16*	-.20*	.36**	-.22**	X				
6. T4 Disengagement	5.45 (1.40)	-.05	-.06	.26*	.09	.33**	X			
7. T1 SWB	5.82 (.92)	.23**	.13	.04	-.16	-.06	-.10	X		
8. T2 SWB	4.46 (1.45)	.16	.04	.57**	-.44**	.34**	.16	.13	X	
9. T3 SWB	5.31 (1.20)	.24*	-.03	.24*	-.15	.29**	.08	.22**	.36**	X
10. T4 SWB	5.21 (1.05)	.24*	-.05	.15	-.06	.21**	.27**	.37**	.25*	.55**

Note: *Correlation significant at $p < .05$; ** Correlation significant at $p < .01$

Bridge to Article 5

In Article 5, we sought to connect research conducted in Articles 1 and 4 to propose a comprehensive motivational model of goal disengagement. This model considers the role of goal motivation across a goal's complete lifecycle, examining (1) how motivation for goal engagement is associated with the initiation of goal disengagement, and (2) how motivation for goal disengagement is associated disengagement progress, once the individual has decided to relinquish their goal.

Concerning our first question of how motivation for goal pursuit is associated with the initiation of goal disengagement, we draw on the findings obtained in Article 1 showing that motives for pursuing a goal are differentially associated with entering into an action crisis: autonomous motives for goal pursuit were associated with less severe action crises whereas controlled motives for goal pursuit were associated with more severe action crises. Thus, a natural continuation of this research in Article 5 was to examine whether peoples' autonomous and controlled motives for goal pursuit are associated with an increased (or decreased) likelihood of initiating goal disengagement.

We hypothesized that autonomous goals may be less prone to goal disengagement since these goals tend not to be mired in decisional conflict during goal pursuit. Experimental work by Ntoumanis and colleagues (2014) supports this prediction. However, the relationship between controlled motivation and goal disengagement is less clear. Article 1 demonstrates that controlled goal motivation is associated with more severe action crises, which may result in an increased likelihood of initiating goal disengagement. However, there is also the possibility that despite being more prone to action crises, the controlled nature of introjected and externally

regulated goals makes them difficult to relinquish and keeps them locked in the perpetual limbo of the action crisis.

Our second question focuses on how people can successfully relinquish goals once they have made an initial decision to disengage. Here we draw on the findings obtained in Article 4, which found that athletes' autonomous motivation for retirement allowed them to make greater progress disengaging from their athletic careers. Generalizing from the findings of Article 4, we hypothesized that autonomous motivation to disengage from a personal goal would be positively associated with disengagement progress over time. Thus, in Article 5 we sought to expand on the findings obtained in Article 4 in multiple ways by: (1) developing a motivation for disengagement scale, (2) using a fully longitudinal design by tracking goals from their selection all the way to goal disengagement, and (3) studying motivation and goal disengagement in more general populations of young adults and community adults.

Lastly, an important insight gained in Article 4 and further explored in Article 5 is that disengagement appears to be a dynamic process that unfolds over months and years. Although athletes in our study retired approximately two years prior to participating (Article 4), most athletes reported not having fully disengaged from their careers at the time of the first survey, and continued to make disengagement (but not reengagement) progress when they were re-assessed 1.5 years later. This prompted us to consider whether individuals may feel stuck and torn about relinquishing the goal, even after making the decision to disengage. We coined the term for this state an "inaction crisis". During an inaction crisis, we propose that someone who has decided to let go of a goal experiences doubts and internal conflict about their decision to let go, and wonders about re-engaging with the goal. We expected inaction crises to interfere with individuals' disengagement progress.

Article 5

Choosing to lose it: the role of autonomous motivation in goal disengagement[6].

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Abstract Article 5

When people hit roadblocks with their personal goals, goal disengagement is an adaptive response associated with improved mental and physical health. However, people can experience difficulty letting go of goals, even when pursuing them is problematic. We introduce a motivational model of goal disengagement by proposing that having autonomous motivation to disengage (a sense of truly identifying with the decision) as opposed to controlled motivation to disengage (feeling forced to let go) allows for people to make greater progress disengaging, and prevents people getting stuck in an "inaction crisis" where they feel torn between disengaging further or re-adopting the goal. Using prospective longitudinal designs, we tracked the goal disengagement of personal goals in university students (Study 1, N = 510) and a general adult sample of Americans (Study 2, N= 446), finding that autonomous motivation for goal disengagement facilitated making disengagement progress. Study 3 (N = 935) reports two 9-month longitudinal samples tracking college students' pursuit of three personal goals. While people's original motivation for goal engagement related to whether they initiated goal disengagement for one or more of their personal goals, people's motivation for goal disengagement uniquely related to whether they made progress letting go of their goal during the process of goal disengagement. This work expands our understanding of the role of autonomous motivation throughout a goal's lifecycle and helps integrate different theoretical frameworks on goal motivation and self-regulation.

Keywords: *autonomous motivation, goal disengagement, Self-Determination Theory, inaction crisis.*

Choosing to lose it: the role of autonomous motivation in goal disengagement.

Your future is in your hands. Your life is what you make of it. And nothing – absolutely nothing – is beyond your reach, so long as you're willing to dream big, so long as you're willing to work hard – Barack Obama

Barack Obama's (2010) "Back to School" speech, quoted above, captures the contemporary zeitgeist of having a "can-do" attitude about personal goals. We are told from an early age by our parents, teachers, coaches, and role-models, that persevering at our goals will pay off, no matter the goal, no matter the cost. Even when goal striving is wrought with setbacks or difficulties, relinquishing important goals violates the ethos of perseverance that characterizes modern-day goal pursuit. However, there is increasing evidence that continued effort and goal persistence are not adaptive if the goal is unattainable (Barlow, Wrosch & McGrath, 2019). When goal progress stagnates because the goal has become overly costly or unrealistic, individuals experience increased psychological distress, biological dysregulation, and physical health problems (Miller & Wrosch, 2007; Wrosch, Scheier & Miller, 2013). In such circumstances, individuals benefit from relinquishing behavioural effort and breaking up the psychological commitment towards the goal – what is referred to as *goal disengagement* (Wrosch, Scheier, Carver, & Schulz, 2003).

While shedding a problematic goal can have important benefits for people's psychological well-being and general health, goal disengagement is not necessarily easy or straightforward. People often invest substantial effort and resources into their personal goals, structure their lives around specific pursuits, and even begin to identify strongly with the goals they strive for. For example, the lives and identities of competitive athletes often revolve around

their sport-related goals (Park, Lavallee, & Tod, 2013). As a result personal goals can become sticky: The psychological adhesive glue that binds someone to their goal and enables them to pursue it whole-heartedly can be difficult - even painful - to peel off, despite a goal's dwindling feasibility or mounting costs (Wrosch et al., 2003). Moreover, sticky goals are rarely ever ripped off overnight. Rather, the very decision to disengage is often deliberated over for weeks and months, during which the pursuer is torn between pushing harder to achieve the goal and letting it go (Brandstätter, Hermann, Schüler, 2013). Then, even after disengagement is initiated, there may be impulses to return to the old goal, such as people who reminisce about an ex-partner after breaking up, or consider returning to a sport that caused them significant injury. In line with Klinger's (1975; 1977) theoretical "incentive-disengagement cycle", goal disengagement can be understood as a process in which breaking up psychological commitment to a goal unfolds over time and can vary in success between different people and between different goals. The question thus arises: why are some people capable of letting go of important yet problematic personal goals, while others struggle to ever free themselves of this nagging thorn in their side? We propose that the answer lies in the different motivations people have for *why* they are disengaging from their personal goals. Specifically, we propose a motivational model of goal disengagement in which we specify what goal-specific motivational factors relate to whether people can successfully disengage from their goals.

At the core of our theorizing, is the idea that people vary in their reasons for why they disengage from their goals: while some people feel autonomous about disengaging from their goal, other people may feel pressured by others, or by their own life circumstances to disengage from their goal, without truly feeling like it is their own choice to let go. For example, imagine two college students who both dreamed of medical school but then realize their grades and

MCAT scores are not competitive. Although being a doctor was once the most important goal in her life, the first student has decided to let go of this goal because the sacrifice to raise her grades and retake tests is too great, and she no longer identifies with a medical career path. This would be considered *autonomous motivation* for goal disengagement because of the agency the student feels after she has weighed her options and reflected on what she values. The second student feels pressure from others to let go of his goal to get into medical school. His parents and career councillor have advised him to redirect his focus to a more realistic career, and he feels ashamed for holding on to a goal that is simply not working out. Thus, he feels that he is forced to let go of his med-school goal - what we consider *controlled motivation* for goal disengagement. We propose that individuals with predominately autonomous motivation for letting go of their goal will make more progress disengaging from their goal than individuals who hold predominately controlled motives for disengaging.

We base our motivational model of goal disengagement on self-determination theory (SDT; see Ryan & Deci, 2017 for review). Decades of SDT research have robustly linked autonomous motivation for goal *engagement* – feeling a sense of volition and whole hearted endorsement towards one's goals during goal selection and pursuit - with subsequent effort, progress, and success at attaining the goal (Koestner, Otis, Powers, Pelletier, & Gagnon, 2008; Ryan & Deci, 2017; Sheldon, 2014). In short, pursuing a goal because it is interesting, meaningful, or personally important, translates into positive goal outcomes. Meanwhile, pursuing a goal for controlled reasons, such as for external rewards or because of internal pressures, has little or no effect on goal progress (Koestner et al., 2008) and is associated with increased emotional distress (Holding, Hope, Harvey, Marion-Jetten & Koestner, 2017).

Although the benefits of feeling autonomous about one's goals are well-documented (Koestner et al., 2008), surprisingly little research has considered whether the process of successfully disengaging from a goal is governed by the same motivational processes (but see Holding, Fortin, Carpentier, Hope, & Koestner, 2018). In the same way that autonomous motives can govern people's engagement with a goal, we suggest that the decision to disengage from a goal can be determined by autonomous motives such as identifying with the benefits of letting a goal go, recognizing that the goal no longer aligns with one's values (integrated autonomous motivation), or accepting that the goal is unattainable (identified autonomous motivation). Our model does not include intrinsic reasons for letting go because parting from a valued goal is likely not undertaken for the inherent fun, interest or enjoyment of the experience. On the other hand, goal disengagement can also be based in controlled motivation, such as disengaging because other people have suggested one should "move on" (external controlled motivation), or because one feels guilty, ashamed or embarrassed for still holding on to a goal that is not working out (introjected controlled motivation).

Our motivational approach to studying goal disengagement differs from how other theoretical perspectives view this process. Research informed by Goal Adjustment Theory has primarily considered dispositional traits as predictors of disengagement, highlighting how some individuals may have a greater goal disengagement capacity than others (Wrosch, Scheier, Miller, Schulz, & Carver, 2003). Conversely, research informed by an SDT framework has considered how motives for goal engagement relate to cognitive ease of disengagement (Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014; Smith & Noumanis, 2014). Critically however, past SDT-based research has not considered motives for disengagement, and whether people successfully disengage from their goal over time once they initiate the process of

disengagement. We integrate these two important approaches and build on them by considering how motivation plays an important role during the processes of goal disengagement.

We consider goal disengagement within the context of the goal's complete lifecycle: starting with goal engagement and ending with successful goal disengagement. We propose that, while motivation for goal engagement relates to whether people decide to begin the process of goal disengagement, it is motivation for goal disengagement that relates to whether people make progress disengaging from their goal, even when accounting for dispositional traits associated with goal disengagement.

Differentiating Motivation for Goal Engagement from Motivation for Goal Disengagement.

If we consider our previous example of the two medical students, it is likely that the students' original motivation for going to medical school plays a role in whether they initiate the process of goal disengagement in the face of obstacles. For example, one student may hold autonomous motives for becoming a doctor. He is fascinated by human biology and he values helping others. Meanwhile, the other student may be pursuing the goal of medical school to please her demanding parents and because she feels like she ought to strive for a prestigious profession. Indeed, the students' differing motivations for pursuing their medical school goal may impact the likelihood of goal disengagement occurring, and could arguably also shape their motives for goal disengagement, and subsequent disengagement progress.

To date, the question of how autonomous motivation relates to goal disengagement has focused on the transition from goal pursuit to the initiation of goal disengagement. The decision to disengage is often met with ambivalence, and preceded by an *"action crisis"*, a critical phase in goal striving, during which the pursuer is torn between increased goal investment and goal abandonment (Brandstätter, Hermann, Schüler, 2013). Having autonomous motivation for goal

engagement shields goals from action crises (Holding et al., 2017), relates to greater persistence in the face of goal difficulty (Ntoumanis et al., 2014a), and is associated with decreased cognitive ease of disengagement when the goal becomes unattainable (Ntoumanis et al., 2014b). Specifically, work linking motives for goal engagement with persistence and ease of cognitive disengagement operationalized goals using cycling or rowing tasks (of approximately 10 minutes) which were experimentally manipulated to model increasing goal difficulty (Ntoumanis et al., 2014a) and goal unattainability (Ntoumanis et al., 2014b). Ntoumanis and colleagues (2014a) found that autonomous motives for the cycling task predicted greater goal persistence as the cycling task became increasingly difficult. Similarly, Ntoumanis and colleagues (2014b) found that autonomous motivation for goal engagement made it more difficult to disengage mentally from the unattainable laboratory cycling goal. While this past work provides important insights as to whether people begin the process of disengagement, the controlled nature of these laboratory experiments cannot address how disengagement unfolds over time within the context of real-world, identity-relevant goals. Thus, we cannot conclude from this previous work how motivation for goal engagement relates to how people successfully carry out the goal disengagement process over time.

We might expect, based on previous experimental research (Ntoumanis et al., 2014b), that people with autonomous motivation for goal engagement might experience more difficulty disengaging, since autonomous goals tend to be more closely aligned with the self (Sheldon, 2014) and may therefore be harder to part with. However, the reverse argument is also plausible: the freedom and flexibility that characterizes autonomous goal striving (Koestner et al., 2008) may give rise to adaptability when goal pursuit is recognized as futile. A third possibility is that having autonomous motivation for goal engagement does not relate to whether people can make

progress disengaging from their goal: while autonomous motives for goal engagement may favour goal persistence and prevent the initiation of disengagement, people's motivation for goal disengagement – which is distinct from motivation for engagement – may uniquely relate to making disengagement progress.

The same question applies to people's controlled motivation for goal engagement. Since controlled goals tend to be more "alien from the self" and in conflict with core interest or values (Koestner et al., 2008; Sheldon, 2014), they might be readily abandoned in the face of obstacles. That being said, the internal and external pressures tied to controlled goal striving may also prevent individuals from freely disengaging, even when efforts towards goal attainment appear futile. To test these questions, it is therefore important that motivation for goal engagement and motivation for goal disengagement are studied together within the context of the same goal.

Action Crises and Inaction Crises

We propose that autonomous motivation for goal disengagement is crucial for successful disengagement because it reduces the conflict that people have over whether or not they should re-engage with their goal – what we term an *inaction crisis.* Similar to how people experience an action crisis when debating between whether or not to begin the process of disengagement, people may experience an *inaction crisis* once they have transitioned from active goal pursuit to goal disengagement. We suggest that during an inaction crisis people feel torn about their decision to disengage from the goal, contemplate reengaging with the goal, and feel stuck in their efforts to let the goal go. For example, if one was pursuing the goal to improve one`s romantic relationship, an action crisis might arise if one felt conflicted about whether to invest more in the relationship (e.g., by seeking couple's therapy to improve communication) or whether to

disengage from the goal of improving the relationship (e.g., by breaking up). If disengagement were initiated (e.g., after a break-up), an "inaction crisis" would involve feeling torn about ending the relationship, wondering if the relationship could have improved with more effort, and feeling stuck with one's unresolved feelings about the relationship.

Why might an inaction crisis occur? Although a goal which someone is attempting to abandon is less attractive than it once was when goal pursuit was initiated (Ghassemi, Bernecker, Herrmann & Brandstätter, 2017), disengagement may still "shake one's self-image to its core" (Carver & Scheier, 2005, p. 536) and feel like a threat to one's identity, not least because the goal may reflect important values and core interests (Carver & Scheier, 1998; 2005; Emmons, 1986). Thus, feeling torn and conflicted about disengaging from a goal (i.e., experiencing an inaction crisis) should interfere with goal disengagement, much like decisional conflicts during goal pursuit (i.e., action crises) impede goal progress (Brandstätter, Herrmann, & Schüler, 2013; Brandstätter & Schüler, 2013; Holding et al., 2017).

We hypothesize that the sense of ownership and agency associated with autonomous motives for disengaging from a goal protect individuals from experiencing an inaction crisis during goal disengagement. In turn, this reduced decisional conflict about disengagement (i.e., a reduced or absent inaction crisis) should result in greater disengagement progress.

Motivation for Disengagement as a Unique Factor in Relation to Disengagement Progress

The viability of our theoretical model depends on distinguishing it from existing predictors of disengagement. Past approaches to understanding goal disengagement have focused on underlying personality dimensions to explain variability in initiating goal disengagement among different people. For example, past research suggests that individuals differ widely and reliably in their general tendencies to disengage from unattainable goals (Wrosch et al., 2003b;

2007). While some individuals readily distance themselves from unattainable or costly goals across contexts, other individuals experience more difficulty parting from problematic pursuits. Wrosch et al. (2007) refer to this tendency as goal disengagement capacity.

A second individual difference that may be relevant for goal disengagement is action orientation. Action orientation captures individuals' characteristic differences in the pursuit of goals through emotion control, performance efficiency, and information processing mechanisms (Kuhl & Goschke, 1994). While action-oriented individuals can effectively regulate thoughts, behaviours and emotions during goal striving, state-oriented individuals get stuck in currently experienced emotions, cognitions, and behaviours, and thus are unable to engage or disengage with goals as appropriate (Beckmann & Kuhl, 1984). Importantly, action orientation is the primary individual difference associated with the experience of action crisis in goal pursuit (Herrmann & Brandstätter, 2013), which typically precedes goal disengagement (Herrmann & Brandstätter, 2015). Since action-oriented individuals tend to be shielded from experiencing action crises in goal pursuit and are better equipped to resolve action crises when they arise (Herrmann & Brandstätter, 2013), this may have implications for their likelihood to initiate and sustain goal disengagement.

A third individual difference that has been identified as relevant for adaptive goal striving is dispositional optimism (Aspinwall & Richter, 1999), which is defined as the extent to which people expect positive, versus negative, outcomes to occur in their future (Scheier, Carver, & Bridges, 2001). Research on this topic has yielded mixed results, with two studies finding a negative association between dispositional optimism and goal disengagement (Ramíres-Maestre et al., 2019; Smagula et al., 2016), one study finding no relationship between optimism and goal disengagement (Rasmussen, Wrosch, Scheier & Carver, 2006), and one study finding a positive

association between optimism and goal disengagement (Amir, 2012), likely because optimistic individuals "may be better able to convince themselves that something [equally good or better] will come along to engage them later" (Wrosch et al., 2003, p.1499). While our aim is not to resolve the debate on the role of dispositional optimism in disengagement tendencies, we seek to demonstrate that autonomous motives for goal disengagement are not reducible to having an optimistic mind-set about future opportunities.

In summary, goal disengagement capacities, action orientation, and dispositional optimism have been identified as important individual differences in adaptive control striving (Heckhausen & Wrosch, 2016). Thus, in the present work we aim to test whether people's motivation for disengagement relates to goal disengagement above and beyond these dispositional traits.

Present Studies

We tested our hypotheses across 3 prospective, longitudinal studies in which we tracked goal disengagement from idiographic, personally meaningful goals in the context of people's everyday lives. Our first two studies examined the relation between motivation for disengagement and disengagement progress in two samples of university students and community adults. In our third study we examined goal disengagement over the goal's entire lifecycle, beginning with goal setting and tracking goals that individuals decided to relinquish. Thus, we could document the distinct roles of motivation for goal engagement and goal disengagement over time.

These studies aimed to build upon the goal disengagement literature in six important ways. First, we tracked goal disengagement progress over time to account for the fact that this process unfolds gradually (Klinger, 1975). Relatedly, we distinguished between the decision to

initiate goal disengagement (i.e., the moment when someone decides they want to reduce behavioural effort and psychological commitment towards a goal), and disengagement progress (i.e., the perception of how far one has come in letting go of a valued goal). Second, we investigated the role of motivation for goal disengagement (i.e., whether someone initiates disengagement for autonomous versus controlled reasons) in predicting disengagement progress. Third, we controlled for relevant dispositional predictors that may explain variance in disengagement progress. Fourth, we examined whether inaction crises occurred during goal disengagement, how they impacted disengagement progress, and whether they were associated with disengagement motivation. Fifth, we studied the motivational origins of goals that were relinquished to understand the roles of motivation for goal engagement and action crisis severity in the decision to initiate disengagement, at both the between and within person levels. Finally, we tracked the goals that individuals disengaged from using their original motivation for goal engagement, action crisis severity, and motivation for goal disengagement to predict subsequent disengagement progress.

Study 1

We conducted a prospective, longitudinal study at a large public North American university in which we tracked undergraduate and graduate students who indicated disengaging from a meaningful personal goal over the course of an academic year (9 months). Participants completed online surveys about their disengagement experience via four surveys administered over the course of the academic year[7]. We predicted that goal disengagement would be a lengthy process with participants gradually making more disengagement progress as the academic year

[7] This study was part of a larger investigation of goal pursuit, autonomy and goal support with two additional follow-up surveys administered throughout the academic year that were not relevant for the present investigation.

progressed. Moreover, we predicted that holding autonomous motives for goal disengagement would predict disengagement progress over time. We also expected that motivation for disengagement would uniquely predict disengagement progress when controlling for individual differences (i.e., goal disengagement capacity, action orientation, and trait optimism) and specific features of the goal (i.e., the amount of time the individual had already spent disengaging, the importance of the goal prior to goal disengagement, as well as the perceived challenge of disengaging from the goal) that may also be associated with goal disengagement (e.g., Holding et al., 2018; Wrosch et al. 2003). Finally, we tested a psychological mechanism whereby autonomous motivation for disengagement might facilitate disengagement progress via mitigating the experience of inaction crisis. In other words, we expected participants who held autonomous motives for their goal disengagement would experience less inaction crises (i.e., decisional conflict, re-engagement impulses) with regards to their goal disengagement, which would allow them to make greater disengagement progress.

Methods

Participants and procedure.

510 participants (82% females; 84% undergraduate, 60% Caucasian, 31% Asian, 5% Hispanic, 3% African-Canadian), ages 17-54 (M = 21.18, SD = 4.02) and attending a large public university were recruited for a year-long study of personal goals and motivation. The questionnaires were administered through the survey software Qualtrics. A panel was created with participants' idiographic responses such that we could plug-in their personal goal in subsequent follow-up surveys. T1 was administered in September at the beginning of the academic year; at this time we asked participants if they were disengaging from a meaningful personal goal. 498 participants (97.6 % of total sample) indicated they had a personal goal that

they were currently disengaging from and typed out the goal[8]. T1 also assessed participants' motivation for goal disengagement, as well as relevant dispositional traits. At the end of the first semester (T2 = December) and mid-second semester (T3 = March), we assessed inaction crisis severity. Disengagement progress was measured in every survey, but we use the last measurement time point (T4 = May) in our analyses. Attrition rates were 11.2% for T2, 7.2% for T3, and 16.1% for T4. Ethical approval for this study was obtained and participants were compensated for their participation.

Measures.

Disengagement goal. At T1, participants read the following prompt to orient them towards the concept of goal disengagement: *The next set of questions will be about disengaging from a meaningful, personal goal. This means letting a goal go. Not all goal pursuits work out in the way we expect them to. Sometimes, we realize that we are not making progress on a goal for various reasons. The goal may have become too difficult or costly to pursue, unexpected life changes can impact our ability to pursue the goal, or new opportunities cause us to re-evaluate our goals. Thus, people distance themselves from old goals that were previously important to them. For example, an athlete might disengage from her goal of training for the Olympics when she sustains a serious injury. Or, a student may disengage from his goal of going to medical school after receiving failing grades in many of his classes. Please think of one goal you are currently disengaging from or that you want to start disengaging from*. The kinds of goals that students indicated disengaging from most frequently related to social goals/hobbies (29.7%) (e.g., Staying friends with everyone, overcommitting to extracurriculars), academics (25.3 %)

[8] Four participants left this section blank, and eight participants answered subsequent questions about their disengagement goal at T1, but failed to type out the goal they were disengaging from. This meant that they did not see their disengagement goal plugged-in during follow-up surveys. As such, we could not use their data, since these participants may not have remembered what goal they typed in T1 and were not given the same reminder as other participants in the study.

(e.g., getting a perfect 4.0 GPA, getting into dentistry), aspects of their personality (18.3%) (e.g., trying to be perfect, pushing myself so hard to do be the best at everything I do), physical appearance, health, and exercise (11.2 %) (e.g., losing 30 pounds), and romantic partners (10.2 %) (e.g., staying together with my ex-girlfriend).

Time disengaging. At T1, we asked participants: *Please indicate how long you have been disengaging from your goal? (In days, weeks, months or years)*. Participants reported a wide range in length in disengagement (0-120 months; *M* = 8.11 months, *SD* = 13.40).

Goal importance. At T1, participants were shown their disengagement goal and asked to rate *How important was this goal to you (before you decided to let it go)?*on a 7 point Likert Scale anchored 1 – *Not at all* to 7 – *Extremely*. Participants' mean goal importance was (*M* = 5.36, *SD* = 1.31), which was interpreted as relatively high, suggesting that participants did not select trivial pursuits to disengage from.

Perceived disengagement challenge. At T1, participants were shown their disengagement goal and asked to rate *How challenging do you think it will be to disengage from this goal* on a 7 point Likert Scale anchored 1 – *Not at all* to 7 – *Extremely*. The mean of participants' perceived disengagement challenge (*M* = 4.09, *SD* = 1.92) was interpreted as the disengagement process being perceived as, on average, neither too easy nor too challenging.

Motivation for disengagement. At T1, participants were asked to rate their agreement with different reasons for disengagement. Items were rated on a 7-point Likert scale from 1 *Strongly disagree* to 7 *Strongly agree*. Five items corresponding to autonomous reasons for goal disengagement including: *I have come to see that this goal doesn't align with my values* and *This goal no longer reflects who I am* (see Table 1 for all items). Consistent with previous research which assesses integrated and identified motivation for goals (Koestner et al., 2008), we

calculated the mean of these items to compute autonomous motivation for goal disengagement (*M* = 3.96, *SD* =1.53, *α* = .81). Three items reflected controlled motivation for disengagement, such as *People have been telling me I have to let this goal go*, which were averaged to compute controlled motivation for goal disengagement (*M* = 3.19, *SD* = 1.48, α = .61).

Goal disengagement capacity. Goal disengagement was assessed with the Goal Adjustment Capacity scale (Wrosch et al., 2003) at baseline. Participants responded to items measuring how they usually react if they have to stop pursuing an important goal (5-point Likert-type scales anchored at 1 = *Almost never true*, 5 = *Almost always true*). Two items were reverse coded and then the four items measuring a person's tendency to disengage from unattainable goals (e.g., *It's easy for me to reduce my effort towards the goal*) were averaged to compute participants' disengagement capacity (*M* = 2.66, *SD* = .87, *α* = .84).

Action orientation. Action (vs. state) orientation was measured with an abbreviated 12-item Action-Control Scale (ACS-24; Kuhl, 1994) previously used in Holding, Hope, Harvey, Jetten and Koestner (2017). Each item describes a potentially stressful situation (e.g., *When I know I must finish something soon*) and has two answer options, one associated with action-orientation (e.g., *I find it easy to get it done and over with*) and one linked to state-orientation (e.g., *I have to push myself to get started*). The two subscales respectively assess failure (AOF) and decision-related (AOD) action orientation; we used six items for each. The scores were computed by adding the action oriented answers for possible totals between 0 and 6. Our abbreviated items yielded an AOD (*M* = 2.99, *SD* = 1.77, α =.64) and an AOF (*M* = 2.09, *SD* = 1.66, α = .64)

Optimism. Dispositional optimism was measured at T1 with the Life Orientation Test – Revised (LOT-R; Scheier, Carver & Bridges, 1994) with 10 items on a 5-point Likert scale

anchored *Strongly Disagree* to *Strongly Agree*. Of the 10 items, three items were reverse coded and four items served as fillers. Sample items included *In uncertain times, I usually expect the best* and *I hardly ever expect things to go my way* (reverse coded). The mean of the 3 positively worded and 3 reverse coded items was taken to compute dispositional optimism (M = 3.43, SD = .72, α =.78).

Inaction crisis during goal disengagement. At T2 and T3 participants rated the degree of decisional conflict they experienced about their decision to disengage. We adapted three items from the English version (Holding et al., 2017) of the Action Crisis Scale (ACRISS) (Brandstätter & Schüler, 2013), which were presented on a 7-point Likert Scale anchored 1 – *Strongly disagree* to 7 – *Strongly agree*. Items included: *I feel conflicted about my decision to disengage from this goal* (decisional conflict), *I feel torn about letting go of this goal* (decisional conflict) and *Part of me wants to re-engage with this goal and continue pursuing it* (re-engagement impulses) (T2: M = 4.03, SD = 1.74, α = .88; T3: M = 3.66, SD = 1.73, α = .89).

Disengagement progress. Disengagement progress was measured at T2, T3 and T4 with three items adapted from a measure that has been used in previous research assessing goal progress (Koestner, Powers, Carbonneau, Milyavskaya, & Chua, 2012). Participants responded to items such as *I feel like I have made a lot of progress disengaging from this goal, I feel like I am on track with my plan to disengage from this goal*, and *I am close to fully letting go of this goal*. All ratings were made on a 7-point scale, ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. Reliability was satisfactory with α's ranging from .91 to .93 for goal progress at T2 (M = 4.66, SD = 1.61), T3 (M = 4.84, SD = 1.72), and T4 (M = 4.83, SD = 1.72). The T4 progress measure was used as the key dependent variable in our analyses.

Results

Preliminary results. The motivation for disengagement items were subjected to a

principal components analysis with Oblimin rotation. Two factors with Eigenvalues above 1.0 emerged and accounted for 58% of the variance. The first consisted of five items and represented autonomous motives for goal disengagement with an Eigenvalue of 3.40 and internal reliability of .81; the second consisted of three items and represented controlled motives for goal disengagement with an Eigenvalue of 1.24 and internal reliability of .61. Table 1 shows the names and factor loadings from the rotated matric for all items.

Table 2 illustrates the descriptive statistics and inter-correlations of all of key variables of study 1. Overall, participants reported significantly higher autonomous motivation for disengagement (M = 3.96, SD = 1.53), compared to controlled motivation for disengagement (M = 3.19, SD = 1.48), $t(497) = 10.50$, $p < .001$. On average, students' inaction crisis about disengagement significantly decreased as the academic year progressed from T2 (M = 4.03, SD = 1.74) to T3 (M = 3.66, SD = 1.73), $t(429) = 4.62$, $p < .001$. Students also made more progress disengaging from T2 (M = 4.66, SD = 1.62) to T3 (M = 4.82, SD = 1.74), $t(429) = -2.28$, $p = .02$. There was no statistical difference in ratings of disengagement progress from T3 to T4 $t(414) = .71$, $p = .48$. Autonomous motivation for disengagement was positively associated with participants' disengagement progress at the end of the academic year (T4), and negatively associated with T2 and T3 inaction crises. Controlled motivation for goal disengagement was not associated with inaction crisis severity, or end-of-year disengagement progress. Inaction crisis severity at both time points was negatively associated with making disengagement progress at the end of the academic year (T4).

Predicting disengagement progress. We tested a hierarchical regression model to establish the effect of motivation for disengagement on disengagement progress[9]. Importantly,

[9] Without controlling for all the covariates, autonomous motivation for goal

we controlled for individual differences and goal-specific factors that may be associated with disengagement progress, to show that motivation for disengagement predicted disengagement progress beyond these factors (see Table 3). In addition, we added T2 and T3 inaction crisis severity in a last step of the regression to examine whether it interfered with disengagement progress. As can be seen in Table 3, at the first step, participants' age was negatively associated with disengagement progress, such that older participants made relatively less progress disengaging from their goal. At the second step, neither goal disengagement capacity, action orientation, or trait optimism were associated with T4 disengagement progress. At the third step, goal-specific factors, such as time spent disengaging, the importance of the goal, or the perceived challenge goal disengagement were also not significantly associated with T4 disengagement progress. At the forth step, autonomous motivation for disengagement was significantly positively associated with T4 disengagement progress, while controlled motivation for disengagement was marginally negatively associated with T4 disengagement progress. Finally, at the fifth step, mid-year assessments of inaction crisis severity during goal disengagement at T2 and T3 were both significantly negatively associated with disengagement progress, such that experiencing inaction crisis during goal disengagement it more difficult for participants to let go of their goal at T4. In total, this model accounted for 23% of the variance in T4 disengagement progress (F (12, 380) = 9.44, $p < .001$).

*Testing indirect effect of inaction crisis severity***.** After establishing that autonomous goal motivation was positively associated with disengagement progress at T4, and negatively related

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disengagement was significantly positively related to T4 disengagement progress (β = .28, t = 5.46, p <.001, *95% CI* [.20, .43]), while controlled motivation for disengagement was significantly negatively related to T4 disengagement progress (β = -.15, t = -2.90, p =.004, *95% CI* [-.29, -.06]), accounting for 7% of the variance in T4 disengagement progress (F (2, 415) = 15.22, $p < .001$).

to inaction crises at T2 and T3, we sought to examine the indirect effects of mid-year inaction crises on goal disengagement (see Figure 1). We used the method outlined by Hayes (2012) to test this mediation model by estimating 95% confidence intervals (CI) of the indirect effect using bootstrap resampling (k = 10000) procedures. We included participants' controlled motivation for disengagement as a covariate in the model. Results from the mediation analysis showed that autonomous motivation for disengaging was negatively related to ratings of T2 inaction crisis severity, b = -.29 (*SE* = .05, t = - 5.49, p < .001, *CI* [- .39, -.19]). In turn, T2 inaction crisis severity was a positive predictor of T3 inaction crisis severity, b = .53 (*SE* = 0.04, t = 12.64, p < 0.001, *CI* [.46, .62]), such that experiencing inaction crisis at T2 was a risk factor for experiencing inaction crisis three months later. In turn, T3 inaction crisis severity was negatively associated with T4 disengagement progress, b = -.51 (*SE* = .10, t = -5.29, p < .001, *CI* [-.70, -.32]), such that the degree to which individuals felt torn about disengaging at T3 was negatively associated with the progress they made letting go of the goal at T4. Next, we examined the total indirect and direct effects. The total effect of autonomous motivation on T4 disengagement progress was significant, b = .46 (SE = .09, t = 4.94 p < .001, *CI* [.28, .64]). The indirect effect of T1 autonomous motivation on T4 disengagement progress, through inaction crisis at T2 and T3, was significant, b = .08 (*SE* = .02, *CI* [.04, .15]). The direct effect of autonomous motivation on disengagement progress over-time was also significant, b = .22 (*SE* = 0.09, t = 2.46, p = .02; *CI* [.04, .39]).

Discussion

The results of Study 1 offer support for our first hypothesis that goal disengagement is not a one-shot event, but rather a lengthy process. On average, participants reported that they had been actively disengaging from their personal goals for at least eight months. We also observed

change in participants' disengagement progress over the course of the study, with significantly more progress being reported at six months than at three months. In line with our second hypothesis, autonomous motivation for disengagement appeared to facilitate goal disengagement nine months later. Importantly, in line with our third hypothesis, autonomous motivation for disengagement related positively to end-of-year disengagement progress, even after controlling for dispositional traits associated with goal adjustment, including action orientation, dispositional optimism, and goal disengagement capacity (Heckhausen & Wrosch, 2016).

We also found evidence that having a reduced experience of inaction crisis about disengaging from the goal at the end of the first semester, and at the middle of the second semester, partially mediated the association between autonomous motivation for disengagement and disengagement progress throughout the academic year. Indeed, findings from this study suggested that decisional dilemmas about abandoning goal pursuit may continue, even after goal disengagement is initiated, and may impede disengagement progress over time. Thus, in line with previous research showing how autonomous motivation for engaging with a goal protects individuals from experiencing an action crisis about continuing with the goal (Hermann & Brandstätter, 2013; Holding et al., 2017), autonomous motivation for *goal disengagement* served a similar function in protecting individuals from feeling torn about their decision to proceed with disengagement.

Goal-specific factors, such as the length of time the student had already been disengaging, the subjective importance of the goal, or the perceived challenge of disengagement, did not predict students' disengagement progress. Interestingly, there was a negative effect of age on the disengagement progress, suggesting that older students had more difficulty disengaging from their personal goals, as compared to younger students. On the basis of the Life-

Span Development model (Heckhausen, Wrosch & Schultz, 2010; 2019) we speculate that because older students may be nearing a time-frame where the window of opportunities for achieving certain goals is narrowing, there may be greater reluctance to part with their goal. An alternative explanation may be that the older students had been pursuing their goal for a longer period of time, and their goal might have been more intertwined with their personal identity, and consequently more difficult to shed. However, given we did not have a priori predictions about the effect of age, we consider these effects exploratory.

Study 2: Tracking Goal Disengagement in the Community

Study 1 provided clear initial evidence that people's motivation for disengaging from their goal predicts their disengagement progress almost one year later. However, Study 1 was limited to educated and relatively young adults, and, therefore, warrants replication in a diverse community sample of differing ages, to ensure the generalizability of the effects. Thus, in Study 2 we aimed to fully replicate Study 1 among an older (non-student) sample of adults. To this end, we recruited community adults to participate in a three-month longitudinal study on personal goals. At baseline (T1) participants were asked if they had a personal goal that had become unrealistic or unattainable that they were letting go of. We then assessed motivation for disengagement and goal-specific factors. Six weeks later (T2), we assessed participants' inaction crisis about disengaging and their disengagement progress. After three months (T3), we re-assessed disengagement progress. In an effort to accommodate the fast-paced Amazon Mechanical Turk (MTurk) survey environment, and to sustain our participants' attention, we opted to only assess one individual difference (i.e., goal disengagement capacity) and use brief measures for each construct.

Methods

Participants and procedure. American adults (N= 446) were recruited on MTurk in two waves for a 3-month study on personal goals (52% female; 80% Caucasian, 7% African American, 8% Asian American, 5% Hispanic American). The second survey (T2) was administered six weeks post T1, and the third survey (T3) was administered twelve weeks post T1. The average age of the first collected wave was approximately 2 years younger (range 22-70, M = 37.17, SD = 10.40) than the second collected wave (range 21-71, M = 39.60, SD = 10.91), t (444) = -2.34 p = .02. The majority of the total sample (98.2%, N= 438) indicated a personal goal that they were currently disengaging from. Attrition rates were low with 9% attrition at T2 and 10.3% at T3. The questionnaires were administered through the survey software Qualtrics. At T1, we assessed whether participants were disengaging from a meaningful personal goal, their motivation for goal disengagement, as well as control variables related to their goal disengagement, such as goal importance, perceived disengagement challenge and time since disengaging. At T2, we assessed the degree to which participants felt conflicted about disengaging, and at T3, we assessed the progress they made in disengaging. Goal adjustment capacity was measured at T3. Ethical approval for this study was obtained and participants were compensated for their participation

Measures.

Disengagement goal. At T1 we asked participants to name a goal they were disengaging from with a similar prompt to Study 1. The kinds of goals that adults in this study indicated disengaging from most frequently related to their job/career (19.1 %) (e.g., Trying to get promoted, Becoming a real estate agent), social goals/hobbies (19.1%) (e.g., Regaining friendships lost during divorce, I'm disengaging from my goal of learning how to computer code), physical appearance, health, and exercise (17.9 %) (e.g., Staying on a keto diet,

Completing a marathon in under 4 hours), romantic partner(s) (9.9%) (e.g., Finding a life partner, Pursuing my friend I like as a partner), academic goals (11.4 %) (e.g., Returning to school for my law degree, Finishing college), family goals (7.8 %) (e.g., Having another child, Having a relationship with my in-laws) and financial/investment goals (7%) (e.g., Owning my own home). Less frequently listed goals related to relocating (4%) (e.g., I'm letting go of my goal of returning to Chattanooga) and changing aspects of one's personality (2.2%) (e.g., Becoming more social).

***Time disengaging*.** As in Study 1, we asked participants to indicate how long they had been disengaging from the goal at T1. Participants reported a wide range in length in disengagement (.00 – 204 months; *M* = 14.04 months, *SD* = 25.94) with only 1.8% of participants indicating that they initiated goal disengagement during the survey.

Goal importance. At T1, participants were asked to rate goal importance as in Study 1 **(***M* = 5.28, *SD* =1.31).

Perceived disengagement challenge. At T1, participants were asked to rate how challenging they anticipated goal disengagement to be as in Study 1 (*M* = 3.92, *SD* = 1.90).

Motivation for disengagement. At T1, motivation for disengagement was measured using two slider scale items adapted from Holding, St. Jaques, Verner-Filion, Kachanoff and Koestner (2019). Autonomous motivation for disengagement was measured with the item *How much do you feel that it is your own choice/desire to disengage from this goal?* and controlled motivation for disengagement was measured with the item *How much do you feel that you are pressured/forced to disengage from this goal?* on a slider scale ranging from 0 = *Not at all* to 100 = *Completely*. Autonomous motivation for goal disengagement (*M* = 75.60 *SD* = 26.96) and

controlled motivation for goal disengagement (M = 23.87, SD = 28.95) were negatively correlated, $r(438) = -.62$, $p < .001$.

Goal disengagement capacity. Goal disengagement capacity was assessed with the same scale used at T3 in Study 1. Since goal disengagement capacity is thought to represent an enduring individual difference measure, we did not expect the later assessment to affect our results *(*M = 2.91, SD = .87, α = .84).

Inaction crisis severity. Measured the same as in Study 1, at T2 (M = 3.97, SD = 1.76, α = .92).

Disengagement progress. Measured the same as in Study 1 at T2 and T3 (T2: M = 4.58, SD = 1.67, T3: M = 4.90, SD = 1.76, α = .91).

Results

Preliminary results. Table 4 illustrates the descriptive statistics and correlations of all of key variables of Study 2. Overall, participants reported significantly higher autonomous motivation for disengagement compared to controlled motivation for disengagement, $t(437) = 21.52$, $p < .0001$. As expected, participants made progress disengaging from their goal over the course of the 3 months, with less disengagement progress at T2 (M = 4.58, SD = 1.67), than at T3 (M = 4.90, SD =1.75), t (369) -3.61 , $p < .001$. Participants' autonomous motivation for disengagement was positively associated with their disengagement progress and negatively associated with controlled motives for disengagement, the importance of the goal, the perceived challenge of disengaging and inaction crisis during disengagement. Controlled motives for disengaging were positively associated with the importance of the goal, the perceived challenge of disengaging, inaction crisis severity and negatively correlated with disengagement progress.

Goal disengagement capacity related positively to disengagement progress, while inaction crisis severity related negatively to disengagement progress.

Predicting disengagement progress. We sought to replicate our Study 1 findings for motivation for goal disengagement by conducting a 5-step hierarchical regression in which we controlled for goal-specific factors and goal adjustment capacity (see Table 5) to predict T3 disengagement progress. In the first step of the regression, we controlled for participants' age and wave of data collection. In the second step, we entered participants' goal disengagement capacity. In the third step, we entered goal-specific factors, such as time spent disengaging, importance of the goal, and perceived challenge of disengaging. In the fourth step, we entered autonomous and controlled motivation for disengaging, and in the fifth step, we entered T2 inaction crisis severity. As can be seen in Table 5, at the first step, neither participant's age, nor the wave of data collection, were associated with disengagement progress. In the second step, goal disengagement capacity was positively related to T3 disengagement progress, suggesting that participants with greater goal disengagement capacity made more disengagement progress, as compared to participants with lower goal disengagement capacity. At the third step, the perceived challenge of disengaging was negatively related to T3 disengagement progress, suggesting that participants who anticipated goal disengagement to be difficult made less progress disengaging, while the time spent disengaging or the importance of the goal were unrelated to disengagement progress. Autonomous motivation was positively related to T3 disengagement progress after controlling for all the aforementioned factors. Controlled motivation for disengagement was unrelated to making disengagement progress. In the last step of the regression, T2 inaction crisis severity was negatively related to making disengagement

progress at T3, suggesting that decisional conflicts about goal disengagement impeded disengagement progress.

Testing indirect effect of inaction crisis severity. After establishing that autonomous goal motivation was positively associated with disengagement progress at T3, and negatively related inaction crisis severity at T2, we tested the indirect effect of autonomous motivation on disengagement progress through reductions in inaction crisis severity (See Figure 2). As in Study 1, we controlled for controlled disengagement motivation in these analyses. The total effect of autonomous motivation on T3 disengagement progress was significant, b = .32 (SE = 0.11, t = 2.81, p = .005, *CI* [.10, .55]). Indicative of mediation, the indirect effect of T1 autonomous motivation on T3 disengagement progress through T2 inaction crisis severity was significant (b = .10 (*SE* = .04, *CI* [.03, .20]). The direct effect of autonomous motivation on disengagement progress over-time remained significant, b = .22 (*SE* = .11, t = 2.01, p = 0.05; *CI* [.00, .43]).

Discussion

Study 2 fully replicated the results of Study 1 with a group of community adults of diverse ages. Again, we found that autonomous motivation for disengaging from a personal goal promoted goal disengagement. Despite this study being considerably shorter than Study 1 – three months as opposed to nine months – the positive effect of autonomous motivation on goal disengagement progress still emerged. Also consistent with Study 1, we found that a reduction in inaction crises was a significant indirect path through which autonomous motivation for goal disengagement facilitated goal disengagement progress. In other words, when community adults felt autonomous about letting go of an unattainable personal goal, they reported lower levels of decisional conflict about disengagement, and consequently, appeared to make more progress distancing themselves from the problematic goal three months later. Consistent with Study 1, the

relation between controlled motivation for disengagement and disengagement progress was non-significant.

We also note some differences relative to the findings we observed in Study 1. Firstly, there was a significant positive effect for goal disengagement capacity on disengagement progress, such that individuals with a greater general tendency to relinquish psychological commitment and behavioural effort in the face of unattainable goals made more progress disengaging from their personal goal. While we did not find this effect in the young adult sample of Study 1, goal disengagement capacity may still be developing in young adults, as they may not have as much experience confronting unattainable goals as older adults (Heckhausen, Wrosch, Schultz, 2019). Developmental research has documented consistently higher levels of goal adjustment capacities in older, as compared to young, adulthood (Brandtstädter & Renner, 1990; Heckhausen, 1997; 1999; Wrosch et al., 2007). Relatedly, it may be the case that goal disengagement capacity plays a significant role in disengagement progress for older adults who face increasing limitations to unencumbered goal pursuit, such as decline in reproductive functioning or increase in health problems, which render the trait more adaptive in later life. Importantly, however, the relation between motivation for goal disengagement and goal disengagement progress remained significant after controlling for the effect of people's dispositional capacity to disengage.

We also observed a significant negative effect for the perceived challenge of goal disengagement on disengagement progress. This finding is consistent with expectancy theory (Atkinson, 1957) in that holding a negative expectancy for goal disengagement (i.e., perceiving the goal as being too challenging to disengage from) might be associated with decreased efforts to disengage, and consequently, less disengagement progress.

In sum, Study 2 provides further evidence that having autonomous motivation for goal disengagement is associated with making more progress when trying to disengage from a goal.

Study 3: Tracking Goals from Engagement to Disengagement

Studies 1 and 2 provide evidence that having autonomous motivation for goal disengagement facilitates disengagement progress over time. However, a limitation of both studies is that we could not consider people's original motivation for goal engagement in relation to their (1) decision to initiate disengagement or (2) their ability to sustain disengagement over time. Thus, in Study 3 we took a holistic perspective of the goal's lifecycle, tracking personal goals from goal selection, through to pursuit, and, for some goals, up until goal disengagement (See Figure 3). This approach is ideal for understanding which goals, from a motivational stand-point, are most - or least - likely be relinquished during goal pursuit. While we predicted that motivation for goal engagement would relate to people's decision to *begin* the disengagement process, we expected that people's motivation for goal disengagement would predict how much progress they made disengaging.

We sought to maximize our chances of measuring naturally occurring goal disengagement in our longitudinal samples by tracking three personal goals that participants pursued over the course of an academic year. Tracking three personal goals per participant also allowed us to use a multi-level modelling approach to determine the extent to which autonomous and controlled motivation for goal engagement impacted the initiation of goal disengagement at the level of the person and at the level of the goal. This is important because prior research has demonstrated that the majority of the variability in goal motivation lies at the within-person level, and is therefore a goal-specific phenomenon, rather than an individual difference

phenomenon (Holding et al., 2017; Milyavskaya Inzlicht, Hope, & Koestner, 2015; Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016).

The first part of our study focused on the prediction of which goals participants would initiate goal disengagement from mid second semester. We expected that individual differences in goal disengagement capacity would be positively associated with the initiation of goal disengagement. In line with prior experimental work (Ntoumanis et al., 2014b), we also hypothesized that autonomous motivation for goal engagement would shield individuals from initiating goal disengagement. Furthermore, based on previous work highlighting the within-person variability of autonomous motives (e.g., Milyavskaya, et al., 2015) we expected that the effects of autonomous motivation for goal engagement would operate on goal disengagement at the within-person level. In other words, we expected individuals would be relatively less likely to initiate disengagement from their most autonomous goals, and more likely to disengage from less autonomous goals.

Since controlled goals are less identity-relevant and personally meaningful than autonomous goals (Koestner et al., 2008), one might expect controlled goals to be more readily abandoned, especially when setbacks and difficulties set in. However, the pressures associated with controlled goal pursuit might also give rise to a rigid persistence that disfavors goal disengagement. As such, we had no directed hypothesis for how controlled motives for goal engagement would be associated with the initiation of goal disengagement. In line with previous research (Herrmann & Brandstätter, 2015), we expected that action crisis severity would be positively associated with the initiation of goal disengagement at both the within and between person levels, such that people would be most likely to disengage from the goal they experienced

the most severe action crisis on, and people's general tendency to experience action crisis during goal pursuit would be positively linked with initiating goal disengagement.

The second part of the study focused on predicting disengagement progress from the specific goals that participants indicated they had started disengaging from mid second semester (T3). At this time point, we measured participant's goal-specific motivation for goal disengagement. If a participant did not report disengaging from any goals, we did not measure disengagement motivation, nor did we track disengagement progress for these participants. Three months later (T4) at the end of the academic year, we measured participants' disengagement progress and their level of inaction crisis.

Critically, because we had previously assessed people's motivation for engaging with the goal that they were now disengaging from, we were able to contrast the predictive effects of motivation for goal engagement and motivation for goal disengagement in relation to disengagement progress. We hypothesized that autonomous motivation for goal disengagement would be positively associated with disengagement progress above and beyond the effects of motivation for goal engagement and action crisis during goal pursuit. We hypothesized that autonomous motives for goal engagement and goal disengagement would be unrelated to each other since they targeted different phases of goal striving. Based on the results of Studies 1 and 2, we did not expect controlled motivation for goal disengagement to impact disengagement progress. Moreover, we expected inaction crisis during goal disengagement to be associated with decreased disengagement progress.

Methods

Participants and procedure. The first sample, Sample A, consisted of four hundred and twenty-five participants (76% females; 57.4% Caucasian, 32.2% Asian), ages 17-27 (M = 20.2,

SD= 2.3), attending a large public North American university who were recruited for a year-long study on personal goals. The second sample, Sample B, is the same sample presented in Study 1: 510 participants (82% females; 84% undergraduate, 60% Caucasian, 31% Asian, 5% Hispanic, 3% African-Canadian) ages 17-54 (*M* = 21.18, *SD* = 4.02). The questionnaires were administered through the survey software Qualtrics. The first survey (T1) was administered at the beginning of the academic year in September, and assessed three personal goals that the participants intended to pursue for at least the duration of the academic year. Figure 3 illustrates a timeline of how different measures were assessed for each of the three personal goals over the course of the academic year. Motivation for goal engagement (autonomous and controlled) was assessed for each of the three goals at baseline. At T2 (mid-first semester), goal-specific action crises were assessed. At T3 (mid-second semester), participants were shown each of their three personal goals and asked whether they were continuing goal pursuit/maintaining progress with the goal, or whether they had initiated goal disengagement. For goals that participants indicated they were disengaging from at T3, motivation for goal disengagement (autonomous and controlled) was assessed. At T4 (end of the academic year), we assessed participants' disengagement progress and level of inaction crisis. Ethical approval for this study was obtained and participants were compensated for their participation

Measures.

Goal description. At T1, participants were asked to list three personal goals that they planned to pursue over the course of the academic year, using the instructions from Koestner et al. (2008). Examples of goals that students generated included: *I want my long-distance relationship to last*; *I want to maintain my 3.9 GPA* and *Spend 3 hours per week on music (guitar or piano).*

Autonomous and controlled motivation for goal pursuit. At T1, we measured goal motivation in terms of people's reasons for pursuing their goals (Sheldon & Elliot, 1998). Participants were asked to rate their motivation for pursuing each of their three chosen goals using five items that assessed external, introjected, identified, integrated, and intrinsic reasons for goal pursuit. All responses were made on a 7-point scale of 1 (*not at all for this reason*) to 7 (*completely for this reason*). As in previous research, autonomous motivation was calculated as the mean of intrinsic, integrated, and identified ratings (Sample A: M = 5.25, SD = .89, average α = .62; Sample B: M = 5.21, SD =.83, average α = .60), whereas controlled motivation was calculated as the mean of external and introjected regulation (M = 3.18, SD = 1.12, average α = .51; Sample B: M = 3.02, SD = 1.13, average α =.54; Koestner et al., 2008).

Action crisis. At T2, we administered the 6-item Action Crisis Scale (ACRISS) for each goal to assess action crisis severity (Brandstätter & Schüler, 2013) using a validated English version of the scale (Holding et al., 2017). The ACRISS assesses goal conflict (*Lately I feel torn between continuing to strive for this goal and abandoning it*), setbacks (*So far my goal pursuit has been smooth and unproblematic*, reverse coded), implemental disorientation (*I often feel stuck and am unsure of how to continue pursuing this goal*), rumination (*I often ruminate about my goal*), disengagement impulses (*I have thought about giving up this goal*), and procrastination (*I find myself not having worked on my goal, despite my intention of doing so*). Participants rated the items on a 7-point scale of 1 (*strongly disagree*) to 7 (*strongly agree*) (M = 3.72, SD = .77, average α = .74; Sample B: M =3.69, SD = .83, average α =.77).

Goal disengagement capacity. Goal disengagement capacity was assessed at T3 in Sample A and T1 in Sample B using the same measure as the previous studies. *(*Sample A: M = 2.86, SD = .80, α = .81; Sample B: M = 2.66, SD = .87, α = .84).

Initiating goal disengagement. At T3 participants were shown each of their three personal goals and prompted with the statement: *You have been pursuing this goal for several months now. Please indicate if you are still pursuing/maintaining this goal or if you are letting this goal go (i.e. disengaging from this goal).* Participants could choose from two options similar to Hermann and Brandstätter (2015): (1) *I am still pursuing this goal and/or I have achieved this goal and am maintaining my progress* or (2) *I have started letting go of this goal* The percentage of participants who indicated initiating goal disengagement for at least one goal was 41% (Sample A) and 38% (Sample B). Of these, the large majority of participants only relinquished one of their three personal goals 82% (Sample A) and 85% (Sample B), with a few reporting disengagement from two personal goals 17% (Sample A) and13% (Sample B), and only a couple reporting disengagement from all three goals .01% (Sample A) and .01% (Sample B). The percentage of goals that were relinquished at this time was: goal 1 = 14.2%, goal 2 = 19.2%, goal 3 = 16.2% (Sample A); goal 1 = 17.1%, goal 2 = 16.3%, goal 3 = 14.8% (Sample B).

Autonomous and controlled motivation for goal disengagement. If participants indicated they had started goal disengagement for one or more of their three personal goals at T3, they were shown follow-up questions related to their reasons for disengaging, identical to those presented in Study 1. Autonomous motivation for disengagement was computed as the average of three items that reflected autonomous for disengagement, with the average α = .84 (Sample A) and α =.82 (Sample B). Controlled motivation for disengagement was computed as the average of three items in Sample A with the average α = .63 and 4 items in Sample B with the average α = .72 (the additional item was “I feel ashamed for how long I have held on to this goal).

Inaction crisis during goal disengagement. At T4 participants rated items relating to inaction crisis severity using the same measure as the previous studies (Sample A: $M = 4.32$, $SD = 1.66$, average $\alpha = .90$; Sample B: $M = 4.52$, $SD = 1.67$, average $\alpha = .86$).

Disengagement progress. At T4 disengagement progress was measured using the same items as Studies 1 and 2 (Sample A: $M = 4.55$, $SD = 1.43$; Sample B: $M = 4.83$, $SD = 1.67$).

Results

Preliminary Analyses. In Sample A, a total of 1263 personal goals were set at the beginning of the academic year. At baseline, participants reported significantly higher autonomous motivation across their three goals ($M = 5.25$, $SD = .89$) compared to controlled motivation ($M = 3.18$, $SD = 1.11$), (t (420) = 28.07, $p < 0.001$). By mid-second semester (T3), participants reported that they had started to disengage from 209 (16.5%) of the original goals. Similarly, in Sample B, a total of 1485 personal goals were set at the beginning of the academic year. By mid-second semester (T3), participants decided to disengage from 221 (15%) of those goals. As in Sample A, participants reported significantly higher autonomous motivation across their three goals ($M = 5.21$, $SD = .83$) compared to controlled motivation across their three goals ($M = 3.02$, $SD = 1.13$), (t (497) = 33.89, $p < .001$).

We conducted pairwise analyses to compare the goals of participants who disengaged from at least one of their goals at T3 on baseline levels of motivation, finding that participants reported significantly lower baseline autonomous motivation for goals they eventually decided to disengage from (Sample A: $M = 5.01$, $SD = 1.34$; Sample B: $M = 4.82$, $SD = 1.29$) compared to the goals they continued pursuing or maintaining at T3 (Sample A: $M = 5.36$, $SD = 1.08$, Sample B: $M = 5.31$, $SD = .99$), (Sample A: t (174) = -3.02, $p = .003$; Sample B: t (187) = 4.36, $p < 0.001$). While in Sample A baseline levels of controlled motivation did not significantly differ

between goals that were maintained versus relinquished at T3, in Sample B the goals that participants eventually decided to disengage from were slightly lower in controlled motivation (M = 2.80, SD = 1.48) than goals they continued to pursue (M =3.05, SD = 1.20), (t (187) = -2.02, p = .05). Consistent with the action crisis literature, participants also reported more severe mid-first semester action crises for goals they disengaged from at T3 (Sample A: M = 4.29, SD = 1.18; Sample B: M = 4.27, SD = 1.24) compared to the goals participants continued to pursue throughout the second semester (Sample A: M = 3.62, SD = .91; Sample B: M = 3.48, SD = .95), (Sample A: t (170) = 6.22, p < .001; Sample B: t (184) = 7.48, p < .001).

As can be seen in Table 6, participants' average baseline autonomous motivation for goal engagement was not correlated with T3 autonomous motives for goal disengagement in either sample. However, there was a significant positive correlation between participants' average baseline controlled motivation for goal engagement and their T3 controlled motivation for goal disengagement in both samples. Neither forms of baseline motivation for goal engagement were correlated with the progress individuals made disengaging from their goal(s) at T4.

Predicting the occurrence of goal disengagement. Using multi-level modeling we regressed whether people disengaged from each of their three goals or not (a level 1 dichotomous variable; where 0 = no disengagement; 1= disengagement initiated) onto the within- and between-person effects of motivation for goal engagement, and the within and between person effects of action crisis severity among the three goals. To reflect the between-effect of person specific individual differences in motivational style for engaging in their goals (e.g., how autonomous John feels about his goals in general as compared to his peers), we entered people's mean level of autonomous motivation across their three goals, and their mean level of controlled motivation across their three goals as a level 2 predictor. To reflect the within-person effect of

how relatively autonomous or controlled each specific goal was relative to the other goals of the individual (e.g., John's level of autonomy for his academic goal versus his romantic relationship goal), we person-centered the autonomous/controlled motivation scores of each specific goal around the person's overall level of autonomous/controlled motivation (i.e., a level 1 within-person predictor). Similarly, we entered people's mean level of action crisis severity across their three goals (a level 2 predictor of overall action crisis experienced by the person) and people's mean centered action crisis score for each of their three goals (a level 1 predictor reflecting the with-in person effect of goal specific action crisis). This allowed us to estimate (1) whether on average people with more autonomous goals and who experienced less action crisis were less likely to disengage from their goals, and (2) whether amongst each individual, relatively autonomous goals and goals with relatively little action crisis were least likely to be targeted for disengagement.

According to Maas and Hox (2005), our sample was adequate to meet the requirements for power (these researchers recommend 50 or more Level 2 units [participants] for an unbiased estimation of the Level 1 and Level 2 variables in MLM). We entered goal disengagement capacity, person-centered autonomous and controlled goal motivation, as well as mean autonomous and controlled motivation as fixed predictors in the multilevel binary logistic regression two-level mixed model with T3 decision to initiate disengagement as a binary dependent variable. For all results please consult table 7.

The model revealed that amongst the three goals which people set within the year, a one point scale increase in autonomous goal motivation was predictive of a 26% (Sample A) 35% (Sample B) percent decrease in participants probability of disengaging from their goal, (Sample A: y = -.30, Exp(b) =.74, *95% CI* Exp(b) [.62, .87], z=3.62, p<.001; Sample B: y = -.44, Exp(b)

=.65, *95% CI* Exp(*b*) [.55, .75], *z*= -5.64, *p*<*.001* . In other words, participants were least likely to initiate goal disengagement from their most autonomous goal, controlling for their general tendency to set autonomous goals. In Sample B there was also a small effect for between-person autonomous motivation, whereby participants that tended to set more autonomous goals in general were less likely to disengage from their goals, *y* = -.18, Exp(*b*) = .84, *95% CI* Exp(*b*)[.70, .99], *z* = -1.99, *p* =*.046.*

The within-person effects for controlled motivation were smaller than the effects for autonomous motivation in both samples, whereby a one point scale increase in controlled goal motivation was predictive of a 15% (Sample A) and 24% (Sample B) percent decrease in participants probability of initiating disengagement from their goal, (Sample A: *y* = -.16, Exp(*b*) = .85, *95% CI* Exp(*b*) [.73, .99], *z* = -2.15, *p*=*.03;* Sample B: *y* = -.27, Exp(*b*) =.76, *95% CI* Exp(*b*) [.67, .88], *z*= -3.81, *p* <*.00*1. In Sample A, participants' goal disengagement capacity was also positively associated with initiating goal disengagement at T3.

We then ran a second model that included person-centered and mean mid-semester action crisis severity to the model. We found that amongst three goals which people set within the year, a one point scale increase in mid-semester action crisis was predictive of a 28% (Sample A) 11% (Sample B) percent increase in participants probability of disengaging from their goal, (Sample A *: y* = .54, Exp(*b*) =1.72, *95% CI* Exp(*b*) [1.44, 2.06], *z*=5.92, *p*<*.001;* Sample B: *y* = .63, Exp(*b*) = 1.89, *95% CI* Exp(*b*) [1.59, 2.24], *z*=7.25, *p*<*.001*). This suggests that participants were most likely to disengage from the goal in which they experienced the greatest action crisis. Furthermore, between-person levels of action crisis were also associated with an increased probability of initiating disengagement from a goal, (Sample A: *y* = .52, Exp(*b*) =1.67, *95% CI* Exp(*b*) [1.35, 2.10], *z*=4.65, *p*<*.001;* Sample B*: y* = .20, Exp(*b*) =1.22, *95% CI* Exp(*b*) [1.01,

1.47], $z = 2.06$, $p = .04$) , suggesting that people who tended to experience more severe action crises with their goals in general were more likely to disengage from their goals at T3. The second model including within and between-person levels of mid-semester action crisis severity as predictors yielded a better fit as judged by the Akaike information criterion (AIC).

Predicting Disengagement Progress. After having established how motivational factors and action crises during goal pursuit affect the decision to initiate goal disengagement, we sought to predict disengagement progress of these goals over the course of the remaining three months of the studies. In other words, the subsequent analyses were only performed on the goals that had been relinquished at T3 (which constituted approximately fifteen percent of the total personal goals that were set). Since the majority of participants did not initiate disengagement for any of their three personal goals by T3, and the majority of participants who did endorse initiating disengagement only did so for one goal (see methods section for break-down of percentages by sample), we did not have the statistical power to conduct MLM analyses for disengagement progress at the within-person level. For the participants that listed more than one disengagement goal, we computed the mean of all goal specific factors for that goal (i.e., autonomous/controlled motivation for goal engagement, autonomous/controlled disengagement motivation, action crisis, inaction crisis, and goal disengagement progress).

The aim for this analysis was to use predictors from different phases of the goal's lifecycle to understand how motivation (for goal engagement and for goal disengagement) as well as decisional conflict about the goal (during goal engagement - action crisis - and during goal disengagement - inaction crisis) impacted disengagement progress. Given the temporal sequence in which these motivational processes and goal-specific experiences occurred, we conducted a stepwise hierarchical regression with goal disengagement capacity, baseline

autonomous and controlled motivation for goal engagement, and T2 action crisis severity in the first step of the model predicting T4 disengagement progress. In the second step we added T3 autonomous and controlled motivation for goal disengagement, and in the third step we added T4 inaction crisis severity (see Table 8).

At the first step of the regression in both samples, neither goal disengagement capacity, autonomous motivation for goal pursuit, nor action crisis severity predicted T4 goal disengagement progress. Controlled motivation for goal pursuit was negatively associated with disengagement progress in Sample B, but showed no association in Sample A. This step accounted for 3% (Sample A) and 5% (Sample B) of the variance in T4 disengagement progress. At the second step of the regression, autonomous motivation for goal disengagement (T3) was positively associated with disengagement progress at T4 in both samples. Thus, when participants held autonomous motives for disengaging from their goal, they tended to report greater progress in their goal disengagement at the end of the academic year.

Conversely, controlled motivation for goal disengagement was negatively associated with disengagement progress at T4 in Sample B, and unrelated to disengagement progress in Sample A. Thus, when individuals held controlled reasons for relinquishing their personal goals, this either hindered their disengagement progress or did not affect their disengagement progress. This second step accounted for an additional 5% (Sample A) and 5% (Sample B) of the variance in T4 disengagement progress.

At the final step of the regression, T4 inaction crisis was negatively associated with disengagement progress in both studies. Said differently, the more participants felt conflicted and torn about their decision to relinquish the goal, the less progress they made disengaging from their goal. This final step accounted for an additional 12% (Sample A) and 6% (Sample B) of the

variance in T4 disengagement progress, with the total model accounting for 19.3% (Sample A) and 16.1% (Sample B) of the total variance in T4 disengagement progress (Sample A: $F(7, 153) = 5.24$, $p < .001$; Sample B: $F(7, 160) = 4.38$, $p < .001$) .

As in Studies 1 and 2, we tested the indirect path from autonomous motivation for goal disengagement to disengagement progress via inaction crises, finding that the total effect of autonomous motivation on T4 disengagement progress was significant at (Sample A: b =.35, SE = .12, t =2.86, p =.005, CI [.10, .59]; Sample B: b = .37, SE = .14, t = 2.56, p = .01, CI [.08, .65). Indicative of mediation, the indirect effect of autonomous motivation on disengagement progress through inaction crisis severity was significant (Sample A: b = .10, SE = .06, CI [.01, .24]; Sample B: b = .13, SE = .06, CI [.03, .27]). Meanwhile, the direct effect of autonomous motivation on disengagement progress stayed significant in Sample A and became non-significant in Sample B (Sample A: b =.25, SE = .12, t = 2.11, p = .04, CI [.02, .48]; Sample B: b = .24, SE = .14, t = 1.70, p = .09, CI [-.04, .52]). We interpret these results with caution however because both the mediator (inaction crisis) and the dependent variable (disengagement progress) where measured at the same time point in Study 3.

Discussion

The results of Study 3 allowed us examine the role of motivation in goal disengagement from the vantage point of the goal's complete lifecycle. Importantly, this allowed us to reconcile existing research on the role of motivation for goal engagement with our new construct of motivation for goal disengagement.

Our first questions pertained to the prediction of how goal disengagement capacity, goal-specific motivation for engagement and goal-specific action crises during goal engagement would predict the initiation of goal disengagement. Only a small percentage of all goals that were

set (approximately 15%) were relinquished in both longitudinal samples. Goal disengagement capacity was positively associated with initiating disengagement in Sample A, such that the dispositional tendency to relinquish unattainable goals made it more likely for participants to initiate disengagement during the study. This is consistent with Goal Adjustment Theory, which finds that those with a greater capacity for goal disengagement tend to let go of unattainable goals across different context and domains (Mens et al., 2015).

Next, in line with our hypothesis and previous research, we found a negative within-person effect for autonomous motivation for goal engagement on the initiation of goal disengagement in both samples, such that individuals were least likely to initiate goal disengagement for their most autonomous goals. This suggest that the goals people were most likely to let go of were the ones they never really wanted in the first place – the less a goal reflected the person's authentic interests, values and identity, the more likely the goal was abandoned following 6 months of goal pursuit. Given that autonomous goals feel easier to pursue (Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016), are shielded from temptations and distractions (Milyavskaya, Inzlicht, Hope & Koestner, 2015), and tend not to result in action crises (Holding et al., 2017), it may be the case that participants were less likely to disengage from their autonomous goals because these goals tended to be less problematic. Indeed, as predicted, there was a positive association between action crisis severity and the initiation of goal disengagement. Individuals were most likely to initiate disengagement on the goal they experienced the most severe action crisis on, and individuals who experienced more severe action crises in general were also more likely to initiate disengagement than individuals who experienced less severe action crises.

We did not have a specific hypothesis for the possible effect of controlled motivation on initiating goal disengagement and were surprised to find a small negative within-person effect for controlled motivation in both samples, since previous studies that have considered controlled motivation in the sport context have found null effects for controlled motivation in predicting ease of disengagement (Mulvihill, Guilmette, Barker, & Bianco, 2018; Smith & Ntoumanis, 2014). One interpretation of this finding could be that individuals were less likely to initiate disengagement from goals they felt more motivated about in general. However, this finding may also point to a maladaptive consequence of controlled goal striving as it is known that controlled goals are more susceptible to action crises during goal pursuit and have been associated with increased symptoms of depression over time (Holding et al., 2017). The combination of controlled goals being associated with problematic goal striving and resistant to initiating disengagement may give rise to maladaptive persistence with troublesome goals.

Our second and core question in the present research context was which factors allow people to relinquish their goals successfully after goal disengagement had been initiated. Since we had obtained ratings of people's motivation for pursuing the goal they were now disengaging from, we were able to contrast the predictive effects of motivation for goal engagement and disengagement for disengagement progress**.** In line with our hypothesis and the findings of the previous two studies, autonomous motivation for goal disengagement was positively associated with end-of-year disengagement progress in both samples. This effect was robust when controlling for goal disengagement capacity, motivation for goal engagement, and goal-specific action crisis severity. Thus, supporting our theoretical model, people's autonomous motivation for goal disengagement uniquely predicted disengagement progress over time.

Controlled motivation for goal engagement appeared to obstruct disengagement progress in Sample B. In other words, when participants felt pressure from the world around them to pursue a goal, they experienced a harder time letting the goal go. Interestingly, we also observed a positive correlation between controlled motivation for engagement and controlled motivation for goal disengagement in both samples, suggesting that when goal pursuit was governed by external reasons or introjected demands, this failure to internalize motivation persisted throughout goal disengagement. This, in turn, had further negative implications for goal disengagement, as controlled motivation for goal disengagement was negatively associated with disengagement progress (in Sample B).

Lastly, inaction crisis were negatively associated with disengagement progress, replicating the association obtained in Studies 1 and 2. In other words, experiencing internal conflict and doubt about disengagement made it more difficult to relinquish the goal.

General Discussion

Across 3 studies we followed people as they tried to disengage from their idiosyncratic personal goals. We found consistent evidence that autonomous motivation for goal disengagement is an important goal-specific predictor of disengagement progress. To our best knowledge, this is the first comprehensive package of longitudinal studies to consider *motivation for goal disengagement* as an antecedent of disengagement progress. Across all studies, having autonomous motivation for disengagement was robustly associated with disengagement progress over time, even when controlling for people's initial motivation for engaging with the goal, and other dispositional factors associated with adaptive goal striving. That is, the more individuals felt choiceful about letting go of a personal goal, identified with the importance of letting go, and realized the goal no longer aligned with their values or reflected their identity, the more they

reported making progress disengaging from the goal. Across the three studies we also found consistent evidence of a psychological process through which autonomous motivation for disengagement facilitates the disengagement progress. Specifically, we found that people with autonomous motivation for goal disengagement were less likely to experience an "inaction crisis" – a feeling of uncertainty and deliberation over whether to reengage with the abandoned goal. Experiencing less inaction crisis was, in turn, associated with greater success at disengaging from one's goal over time.

Our studies also provide consistent evidence that motivation for disengagement is distinct from the original motivation that one has for engaging with the goal. Indeed, both forms of motivation were not significantly correlated and played unique roles across the goal's lifecycle. During goal engagement, autonomous motivation shielded goals for goal disengagement. Importantly, autonomous motives for goal engagement did *not* relate to whether people could successfully disengage from their goal once initiating this process. In contrast, autonomous motivation for goal disengagement was consistently associated with making greater disengagement progress, and served the adaptive function of bringing the disengagement process closer to completion. Together, these findings show that autonomous motivation for goal engagement and disengagement operates independently and may serve different adaptive functions at different stages of the goal's lifecycle.

The effects of autonomous motivation can be contrasted with the effects of controlled motivation. Controlled motivation for engaging with the goal also appeared to shield goals from disengagement. However, the adaptiveness of this goal regulation is questionable, given that controlled motivation for goal engagement was positively associated with action crisis severity during goal pursuit. In other words, people who tended to hold on to their goals for controlled

reasons were doing so even though these goals tended to be more problematic and beset with internal conflict. Moreover, feeling pressure from others to disengage or feeling ashamed for holding on to a goal (i.e., controlled motivation for disengagement) was either not associated with making disengagement progress (Study 2 and 3a) or negatively associated with making disengagement progress (Study 1 and 3b). This underscores the potential costs of both pursuing and abandoning goals for reasons that are not aligned with one's core interests and values.

Implications for Self Determination Theory

By considering the role of autonomous motivation in the context of disengagement our research provides an important extension to Self-Determination Theory[10] (SDT; Ryan & Deci, 2017). Previous SDT-based research has mostly considered the different effects of autonomous and controlled motives in goal striving for self-regulatory outcomes such as effort, performance, persistence, progress and attainment. Importantly, autonomous motivation appears to optimize goal pursuit because it is associated with adaptive goal processes including greater subjective ease of effort (Werner et al., 2016), the perception of fewer future obstacles (Leduc-Cummings, Milyavskaya, & Peetz, 2017), less severe action crises (Holding et al., 2017), decreased conflict between goals (Kelly, Mansell, & Wood, 2015), shielding of goals from temptations and distractions (Milyavskaya et al., 2015), task-oriented coping (Gaudreau, Carraro, & Miranda, 2012) and more effective use of implementation plans (Koestner, Lekes, Powers, & Chicoine, 2002; Koestner et al., 2006). The present research builds on this past work by introducing a parallel process for the role of autonomous motivation in goal striving. In the same way that autonomous motives for attaining a goal facilitate goal progress and achievement, autonomous motives for relinquishing a goal seem to facilitate goal disengagement.

[10]) Specifically, Organismic Integration Theory (OIT).

Our concept of motivation for disengagement builds on the preliminary work of Holding et al., (2018) who studied autonomous and controlled motives for career termination in professional athletes. The study found that athletes with autonomous motives for career termination made more progress disengaging from their athletic careers in retirement and reported greater subjective well-being than athletes with predominately controlled motives for career termination. Our work also extends upon a small set of studies which have explored the non-intuitive idea that people can have different motivations for *not* engaging with a target goal. Previous work has documented how unemployed peoples' (Vansteenkiste, Lens, De Witte, De Witte and Deci, 2004) and nurses' (Halvari, Vansteenkiste, Brørby, & Karlsen, 2013) can have autonomous and controlled reasons for *not* searching for a job. Motivation for not engaging in behaviour was consequential, relating to job-search behaviour and well-being beyond peoples motivation to search for a job. Similar to motivation for not engaging with a goal, motivation for disengagement also involves motivation that targets a reduction in behavioural effort (although these constructs differ, in that motivation for disengagement also targets a reduction in psychological commitment towards the goal). While motivation is often considered with respect to people engaging in active goal pursuit, our work further shows the importance of considering motivational processes in relation to trying to *reduce* active goal pursuit.

Implications for Goal Adjustment Theory

The idea that goal-specific motives underlying goal disengagement can have consequences for the success of disengagement also has important implications for Goal Adjustment Theory. To date, Goal Adjustment Theory proposes that goal disengagement is shaped by personality characteristics and that people vary in the manner in which they generally react to blocked goals across life domains. As a consequence, the majority of research in this

area has employed a dispositional measure of goal adjustment capacity called the Goal Adjustment Scale (GAS; Wrosch et al., 2003). While personality characteristics are useful for understanding who generally tends to disengage in the face of blocked goals, we argue that considering people's motivation for relinquishing specific goals is critical because it is context (goal) specific. Our findings suggest that even people who have traits that make them well-suited for goal disengagement may struggle to disengage from goals that they harbour little autonomous motivation to disengage from. Indeed, our focus on goal-specific disengagement is in line with a growing body of research suggesting that the appropriate level of analysis for understanding goal characteristics and outcomes is at the goal level (Milyavskaya & Werner, 2018).

Implications for Action Crises in Goal Pursuit

By introducing the concept of an "inaction crisis" which can follow the decision to disengage, we extend past research which has considered the role of "action crisis" during the disengagement process (e.g., Brandstätter, Hermann, Schüler, 2013). Although Herrmann and Brandstätter (2015, p.122) argue that "goal disengagement frequently results from, and represents the *endpoint* of, a long-lasting decision process", our results suggest that the decisional conflict about engaging with or abandoning a goal may re-surface or linger even after goal disengagement has been initiated.

Consistent with Klinger's (1975, 1977) theoretical propositions about disengagement being a process that unfolds over time, we suggest that conflicts and doubts may precede the decision to disengage (action crisis), but can also resurface or emerge once the decision to disengage has taken place *(inaction crisis).* Theoretically, this points to the possibility of extending Gollwitzer's Rubicon Model (1990) in which individuals "cross the Rubicon" once they transition from a pre-decisional phase to choosing a goal and forming a commitment.

Indeed, with the introduction of the action crisis as a critical phase before goal disengagement (Brandstätter, et al., 2013), and the conceptualization of disengagement as a process that can be wrought with internal conflict, it appears as though individuals who are stuck with a goal must cross a second Rubicon to initiate disengagement and activate inhibitory functions that result in a reduction of effort and psychological commitment.

Clinical/Applied Implications

Our work answers the call of goal adjustment researchers "to identify factors that facilitate goal adjustment processes [beyond dispositional traits], as such research could be used to improve quality of life for individuals who have difficulty adjusting to unattainable goals, or individuals who frequently encounter unattainable goals" (Mens, Scheier, & Wrosch, 2015, p. 3). The present research could be applied in contexts where goal disengagement is an important task for maintaining adaptive functioning. For example, goal disengagement has been shown to be highly adaptive in certain medical contexts in which goals can become unattainable or overly costly, such as following cancer treatment (Castonguay, Wrosch, & Sabiston, 2014; Schroevers, Kraaij, & Garnefski, 2008), multiple sclerosis (Neter, Litvak, & Miller, 2009), fertility issues (Heckhausen, Wrosch, & Fleeson, 2001; Kraaij, Garnefski, Schroevers, Weijmer, & Helmerhorst, 2010; Thompson, Woodward, & Stanton, 2011), and as a result of being a caregiver (Wrosch, Amir, & Miller, 2011). Likewise, goal disengagement is important during career transitions, such as following athletic career termination (Holding et al., 2018), or during retirement (Farquhar, Wrosch, Pushkar, & Li, 2013; Gagné, Wrosch & Brun de Pontet, 2011).

In these contexts, clinical practitioners and counsellors may play an important role in educating clients about goal disengagement. For example, counsellors working in these services can help their clients identify possible goals that they want to let go of, normalize

disengagement, and provide psychoeducation about the benefits of goal disengagement. Our findings suggest that it may also be important to explore the motivations underlying the goal(s) in question, both the reasons one had for pursuing the goal, as well as the reasons for letting go, in order to optimally facilitate disengagement. Clients with few autonomous reasons for disengagement may benefit from autonomy enhancing interventions designed to help the client internalise their motivation for letting go. These interventions could, for example, explore attitudes about disengagement, validate clients' emotional responses about disengagement, and help clients generate autonomous reasons for why disengagement may be in their best interest or congruent with other life values. Clinical interventions drawn from Acceptance and Commitment Therapy (ACT) may be especially useful, as this therapy invites people to open up to unpleasant feelings (e.g., sadness, shame, anger or fear about losing the goal) and to move toward valued behaviour (Hayes, Strosahl & Wilson, 2012). By accepting negative emotions associated with loss and thinking about important values, interventions based in ACT may enhance autonomous motives for relinquishing a goal and facilitate moving towards other pursuits that encompass core values.

Limitations and Future Directions

It is also important to note the limitations of the present research. Although all of our studies used prospective longitudinal methodology to track goal pursuit and goal disengagement, replicating these effects with other methodologies, such as experimental paradigms or experience sampling, is warranted. This is important for establishing the causality of the reported effects, which cannot be achieved with longitudinal prospective studies. The present studies also relied on self-report measures that may introduce the potential for socially desirable responding (Braun, Jackson & Wiley, 2001), or inaccurate self-perceptions (Paulhus & Vazire, 2007). This could be

addressed with future studies that provide informant reports of goal disengagement, or where disengagement is measured using more objective metrics (e.g., monitoring posts on social media that relate to the former goal).

Typically, goal disengagement is studied with specific populations who have faced certain life events or have passed developmental deadlines which render specific goals unattainable, such as studies focusing on late-midlife adults who disengage from time-framed goals, such as bearing a child or finding a romantic partner (Heckhausen, Wrosch & Fleeson, 2001; Wrosch & Heckhausen, 1999). However, rather than focus on one specific type of goal or population, we studied goal disengagement in a general population of young and middle-aged adults who nominated heterogeneous blocked goals. A strength of this approach is the relative generalizability of our motivational model of disengagement to a broad population of North American adults and a diverse number of personal goals, as opposed to limiting our conclusions to specific groups or specific goals. However a limitation is that the objective unattainability or blockage of goals was unknown and could not be controlled for in our analyses. Even when the same goal was nominated by different participants (e.g., "Going to graduate school"), we could not judge whether this goal was feasible and within reach for some, and truly unattainable for others. Therefore, our findings cannot speak to whether goal disengagement was necessarily warranted for any given goal. That being said, a goal's objective unattainability may be less relevant in justifying the decision to disengage than the participants' subjective sense of a goal being overly costly, demanding, unrealistic or problematic. Furthermore, since the majority of goal adjustment research has focused on the adaptive outcomes associated with disengagement, such as improved subjective well-being and physical health (for a review see Wrosch, Scheier, & Miller, 2013), we did not consider well-being outcomes in the scope of the present research,

focusing instead on the initiation and progression of goal disengagement as our key dependent variables. However, future research should consider a comprehensive model of motivation, action crisis, disengagement and well-being outcomes.

Goal Adjustment Theory identifies two processes – goal disengagement and goal reengagement - that enable a person to adapt to the experience of unattainable goals. Therefore an important area for future research is to examine whether motivation for goal disengagement impacts goal reengagement. According to Goal Adjustment Theory, goal reengagement consists of three components: identifying, committing to, and putting effort toward achieving alternative goals. Mens and collegues (2015, p. 2) argue that ideally, these alternative goals will express a core aspect of the self that the previous unattainable goal served. From an SDT perspective, this would be operationalized as the reengagement goal(s) being autonomously motivated, reflecting the person's core interests or values. Future research should investigate whether motivation for goal disengagement is related to the likelihood of selecting an alternative goal to pursue, and the motivation for reengaging with the new goal(s). For example, it may be the case that individuals who feel controlled about relinquishing a goal, (e.g., being accepted to medical school), may adopt new goals that reflects controlled motives, (e.g., applying to another prestigious profession out of feelings of pressure). Likewise, individuals who feel choiceful and agentic about relinquishing a goal may feel free to choose a new goal that encompasses their authentic self.

While much SDT research is concerned with the reasons *why* someone engages in goal pursuit (i.e., Organismic Integration Theory, Ryan & Deci, 2017), future research may bridge other important SDT mini-theories with Goal Adjustment Theory to better understand adaptive goal disengagement. For example, considering the aspirational content of people's goals, the *what* of people's goal disengagement, may also be relevant for understanding which goals are

easy or difficult to relinquish (Goal Contents Theory; Ryan & Deci, 2017). Goal Contents Theory differentiates between two broad categories of goals: *extrinsic* aspirations (pursuit of wealth, fame, and image) and *intrinsic* aspirations (pursuit of personal growth, relationships, and community contribution), finding that a strong focus on extrinsic aspirations is related to lower well-being, whereas placing a priority on intrinsic aspirations is related to greater well-being (Kasser & Ryan, 1993;1996; Hope, Holding, Verner-Filion, Sheldon, & Koestner, 2019). Future research could investigate whether Goal Contents Theory may contribute to our understanding of motivation for goal disengagement. For example, disengaging from an extrinsic goal, like being a high earning corporate lawyer (Sheldon & Krieger, 2004), may be associated with controlled motives for disengagement.

Likewise, Basic Psychological Needs Theory (BPNT) offers a second promising avenue through which to bridge SDT and goal adjustment research. BPNT focuses on the relations of basic psychological need satisfaction/frustration to well-being and ill-being. The three needs of autonomy, competence and relatedness are thought to be essential psychological nutrients for promoting optimal wellness and thriving (Ryan & Deci, 2017). In contrast, need frustration, is associated with greater ill-being and impoverished functioning (Vansteenkiste & Ryan, 2013). Assessing goal-specific need satisfaction and frustration may lead to additional insights with regards to which goals are adaptive to disengage from, and how disengagement from a need satisfying or a need frustrating goal typically unfolds. For example, it may be less adaptive to disengage from goals, such as recreational reading, which tend to satisfy basic psychological needs and buffer against emotional distress (Levine, Cherrier, Holding & Koestner, in press). In contrast, it might be more adaptive to disengage from goals that frustrate needs for autonomy, competence and relatedness.

In summary, our research suggests that internalizing the reasons for goal disengagement can help individuals to let go of personal goals, but future research is needed to examine if the aspirational content of the goal or need-related experiences associated with goal striving may shed further light on factors that facilitate or hinder goal adjustment.

Conclusion

Abandoning the stranded or sinking ship of a blocked goal can be difficult. By examining the motivational underpinnings of goal disengagement, the present studies demonstrate that autonomous motives for letting go help people successfully disengage from blocked personal goals. When people feel autonomous about disengaging, they tend to experience less inaction crisis (i.e., internal conflict) about letting go, and with this clarity, are able to part ways with the goal. This research considered *both* the roles of motivation for goal engagement and goal disengagement, arguing that these are two distinct motivational processes that are relevant for different stages of a goal's lifecycle: the former for the initiation of disengagement, and the later for the progression of disengagement. During goal engagement, autonomous motivation optimizes goal pursuit and shields goals from disengagement. However, during goal disengagement, when relinquishing the goal is vital for preserving health, well-being, and motivational resources, autonomous motivation for disengagement helps set people free of their burden.

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Tables Article 5

Table 1
All items and factor loadings of the motivation for disengagement scale (Study 1).

Items	Autonomous Motives Factor	Controlled Motives Factor
This goal no longer reflects who I am.	**.92**	-.18
I have come to see that this goal doesn't align with my values.	**.86**	-.02
I have accepted that I will never attain this goal.	**.43**	.14
I have come to realize that this goal isn't good for me.	**.74**	.16
Continuing to pursue this goal would be a waste of time.	**.76**	.01
I feel pressured to "move on" from this goal.	-.03	**.71**
People have been telling me I have to let this goal go.	-.02	**.82**
I feel badly about how long I have held on to this goal.	.09	**.68**

Table 2
Descriptive Information and Correlations Between Variables of Study 1.

	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Autonomous Motivation for Disengaging (T1)	3.96 *(1.53)*	-										
2. Controlled Motivation for Disengaging (T1)	3.19 *(1.48)*	.41***	-									
3. Goal Importance (T1)	5.36 *(1.31)*	.10**	.30***	-								
4. Perceived Challenge (T1)	4.09 *(1.92)*	.18***	.46***	.45***	-							
5. Time Disengaging (T1)	8.11 *(13.40)*	.06	.00	.02	-.00	-						
6.Goal Disengagement Capacity	2.66 *(.88)*	-.03	-.21***	-.25***	-.30***	.08	-					
7. Failure-Related Action Orientation (T1)	2.09 *(1.66)*	-.07	-.13**	-.14**	-.12**	-.01	.19***	-				
8. Decision-Related Action Orientation (T1)	2.99 *(1.77)*	-.08	-.02	-.06	-.04	-.01	-.09	.16***	-			
9. Dispositional Optimism (T1)	3.43 *(.72)*	-.05	-.06	-.12**	-.07	-.05	.11	.27***	.22***	-		
10. Inaction Crisis Severity (T2)	4.03 *(1.74)*	-.23***	.04	.22***	.12*	-.06	-.08	-.05	-.06	-.19***	-	
11. Inaction Crisis Severity (T3)	3.66 *(1.73)*	-.24***	.01	.18***	.00	-.08	-.05	-.03	-.07	-.14**	.56***	-
12. Disengagement Progress (T4)	4.83 *(1.72)*	.22***	-.04	-.10	-.06	.06	.08	-.02	.05	.09	-.37**	-.40***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 3
Hierarchical Regression Predicting T4 Disengagement Progress in Study 1.

Step	Variable	*B*	*t*	*95% CI*	F^{Δ}	R^{Δ}
1	Age	-.15**	-2.98	[-.10, -.02]	(1, 391) = 8.90 **	.02
	Failure-Related Action Orientation (T1)	-.03	-.52	[-.14, .08]		
2	Decision-Related Action Orientation (T1)	.04	.73	[-.06, .14]	(4, 387) = 1.27	.01
	Goal Disengagement Capacity (T1)	.07	1.39	[-.06, .33]		
	Dispositional Optimism (T1)	.08	1.49	[-.06, .44]		
	Time Disengaging (T1)	.07	1.29	[-.00, .02]		
3	Importance of Goal (T1)	-.07	-1.13	[-.23, .06]	(3, 384) = 1.10	.01
	Perceived Challenge (T1)	-.01	-.216	[-.11, .09]		
4	Autonomous Motivation for Disengaging (T1)	.25***	4.66	[.16, .40]	(2,383) = 10.90***	.05
	Controlled Motivation for Disengaging (T1)	-.11+	-1.92	[-.27, .00]		
5	Inaction Crisis Severity (T2)	-.16**	-2.84	[-.28, -.05]	(2, 380) = 33.25***	.14
	Inaction Crisis Severity (T3)	-.30***	-5.14	[-.41, -.18]		

Note. *** $p < .001$, ** $p < .01$, * $p < .05$, +$p = .056$; Gender was not significantly related to disengagement progress and was therefore not included in the final model for clarity.

Table 4
Descriptive Information and Correlations Between Variables of Study 2.

	M (SD)	1.	2.	3.	4.	5.	6.	7.
1. Autonomous Motivation for Disengaging (T1)	75.60 (26.96)	-						
2. Controlled Motivation for Disengaging (T1)	23.87 *(28.9)*	-.62***	-					
3. Goal Importance (T1)	5.28 *(1.31)*	-.11*	.24***	-				
4. Perceived Challenge (T1)	3.92 *(1.90)*	-.18***	.20***	.32***	-			
5. Time Disengaging (T1)	14.04 *(25.94)*	.01	-.01	-.08	-.08	-		
6.Goal Disengagement Capacity (T3)	2.91 *(.87)*	.07	-.10	-.21***	-.21***	-.02	-	
7. Inaction Crisis Severity (T2)	3.97 (1.76)	-.25***	.24***	.20***	.20***	-.10*	-.26***	-
8. Disengagement Progress (T3)	4.90 (1.76)	.17***	-.10*	-.12*	-.21***	-.01	.19***	-.37***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 5
Hierarchical regression predicting T3 disengagement progress from a personal goal in Study 2.

Step	Variable	*B*	*t*	*95% CI*	F^{Δ}	R^{Δ}
1	Age	-.09	-1.63	[-.03, .00]	(2, 366) = 3.44 *	.02
	Wave of Data Collection	-.10	-.1.91	[-.71, .01]		
2	Goal Disengagement Capacity (T3)	.20***	3.99	[.20, .60]	(1, 364) = 15.92***	.04
3	Time Disengaging (T1)	-.02	-.38	[-.01, .01]	(3, 362) = 3.95**	.03
	Importance of Goal (T1)	-.02	-.40	[-.18, .12]		
	Perceived Challenge (T1)	-.17**	-3.14	[-.25, -.06]		
4	Autonomous Motivation for Disengaging (T1)	.17**	2.62	[.00, .02]	(2,360) = 4.27*	.02
	Controlled Motivation for Disengaging (T1)	.04	.61	[-.01, .01]		
5	Inaction Crisis Severity (T2)	-.31***	-6.11	[-.61, -.41]	(1, 359) = 37.32***	.08

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; Gender was not significantly related to disengagement progress and was therefore not included in the final model for clarity.

Table 6
Descriptive information of and correlations between variables of Study 3.

	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.
1. Autonomous Motivation for Goal Pursuit (T1)	5.25 *(.89)* 5.21 *(.83)*	-	-.06	-.09	.07	.06	.08	.12	-.11*
2. Controlled Motivation for Goal Pursuit (T1)	3.18 *(1.12)* 3.02 *(1.13)*	-.13**	-	.32***	.13	.21**	.12	-.12	.02
3. Mean Action Crisis (T2)	3.72 *(.77)* 3.69 *(.83)*	-.21*	.30***	-	.08	.22**	.12	-.07	-.08
4. Autonomous Motivation for Goal Disengagement (T3)	3.01 *(1.50)* *2.92 (1.55)*	-.05	.08	.05	-	.39***	-.17*	.13	.11
5. Controlled Motivation for Goal Disengagement (T3)	2.51 *(1.25)* 2.30 *(1.19)*	-.01	.17*	.15	.43***	-	.13	-.12	.07
6. Inaction Crisis (T4)	4.32 *(1.65)* *4.52 (1.67)*	-.00	.27**	.24***	-.13	.08	-	-.33***	-.13
7. Disengagement Progress (T4)	4.55 *(1.43)* 4.83 *(1.67)*	-.02	-.10	-.02	.19*	-.01	-.39***	-	.06
8. Goal Disengagement Capacity	2.86 *(.80)* 2.66 *(.88)*	.19***	.00	-.01	-.02	-.05	-.09	.10	-

Table 7

Multilevel binomial logistic regression predicting the T3 decision to disengage from personal goals across two samples

	Study 3 Sample A					Study 3 Sample B				
	y	*SE*	*z*	Exp (*b*)	*95% CI*	*y*	*SE*	*z*	Exp (*b*)	*95% CI*
Model 1										
Goal Disengagement Capacity	0.26**	0.10	2.67	1.30	[.07, .46]	0.01	0.09	0.06	1.00	[-.16, .17]
Autonomous Motivation for Goal Engagement (within person)	-0.30***	0.08	-3.62	0.74	[-.47, -.14]	-0.44***	0.08	-5.64	0.65	[-.59, -.29]
Autonomous Motivation for Goal Engagement (between person)	-0.06	0.09	-0.79	0.93	[-.24, .01]	-0.18*	0.09	-1.99	0.84	[-.35, -.00]
Controlled Motivation for Goal Engagement (within person)	-0.16*	0.08	-2.15	0.85	[-.31, -.01]	-0.27***	0.07	-3.81	0.76	[-.41, -.13]
Controlled Motivation for Goal Engagement (T1) (between person)	-0.05	0.07	-0.75	0.95	[-.19, .08]	-.02	0.07	0.26	1.02	[-.11, .14]
Model 2										
Action Crisis Severity (within person)	0.54***	0.09	5.92	1.72	[.36, .72]	0.64***	0.09	7.25	1.89	[.46, .80]
Person's Average Action Crisis Severity (between person)	0.52***	0.11	4.65	1.69	[.30, .74]	0.20*	0.10	2.06	1.22	[.01, .39]

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 8

Hierarchical regression predicting disengagement progress (T4) from goals that were spontaneously disengaged from in Study 3.

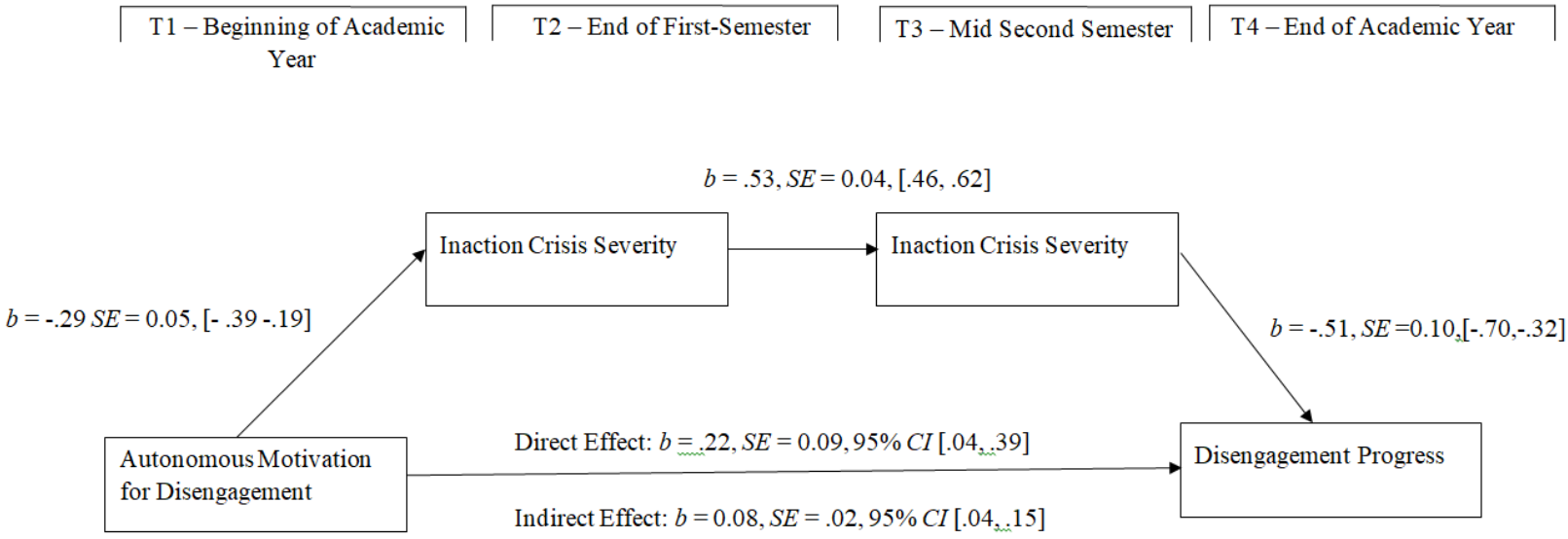
		Study 3 Sample A					Study 3 Sample B				
Step	Variable	*B*	*t*	*95% CI*	F^{Δ}	R^{Δ}	*B*	*t*	*95% CI*	F^{Δ}	R^{Δ}
1	Goal Disengagement Capacity	.14	1.71	[-.04, .54]			.06	.79	[-.18, .42]		
	Autonomous Motivation for Goal Pursuit (T1)	.13	1.48	[-.05, .32]			.07	.94	[-.11, .29]		
	Controlled Motivation for Goal Pursuit	.01	.17	[-.14, .16]			-.20*	-2.53	[-.41, -.05]		
	Action Crises (T2)	.03	.42	[-.16, .24]	(4, 156) = 1.12	.03	.08	.94	[-.11, .31]	(4, 163) = 2.13	.05
2	Autonomous Motivation for Disengaging (T3)	.24**	2.69	[.06, .39]			.21**	2.50	[.05, .42]		
	Controlled Motivation for Disengaging (T3)	-.08	-.86	[-.31, .12]	(2, 154) = 3.70*	.05	-.22*	-2.59	[-.58, -.08]	(2, 161) = 4.82**	.05
3	Inaction crisis about Disengaging (T4)	-.37***	-4.79	[-.45, -.19]	(1, 153) = 22.93***	.12	-.26***	-3.31	[-.41, -.11]	(1, 160) = 10.95***	.06

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Figures Article 5

Figure 1

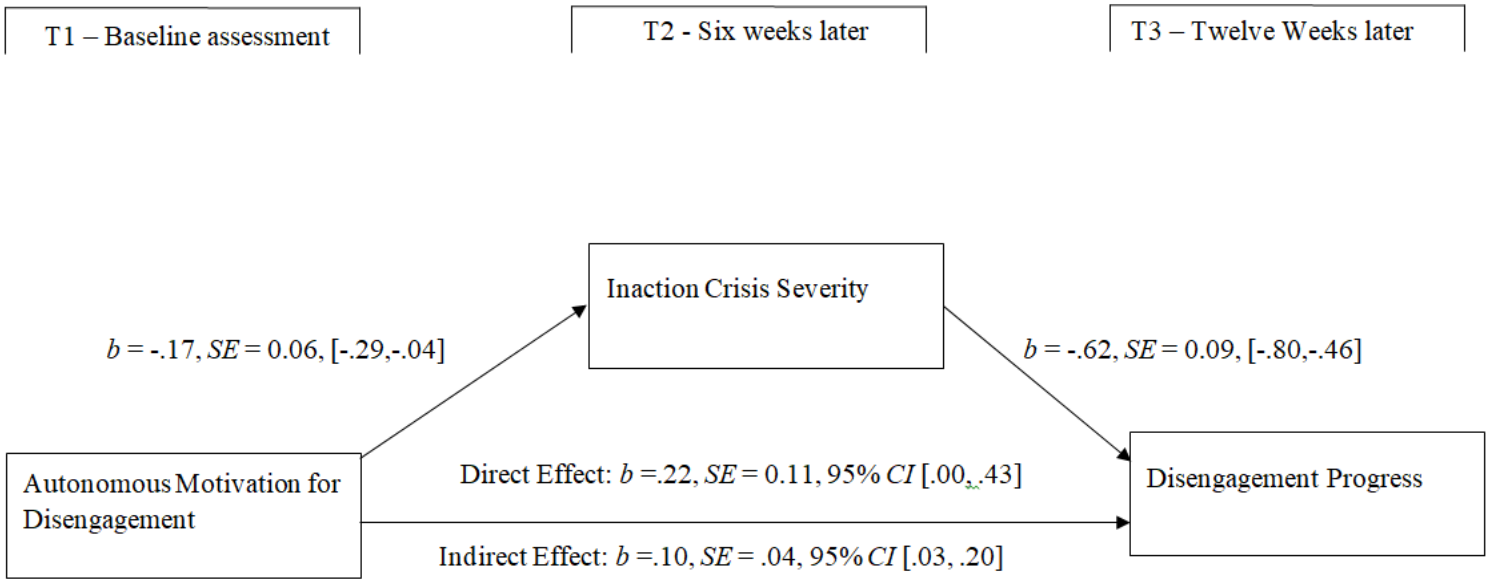
Study 1 test of indirect effects of autonomous motivation for disengaging on disengagement progress via inaction crisis severity.



Note: The confidence intervals represent the 95% CIs, baseline controlled motivation controlled for in analysis.

Figure 2

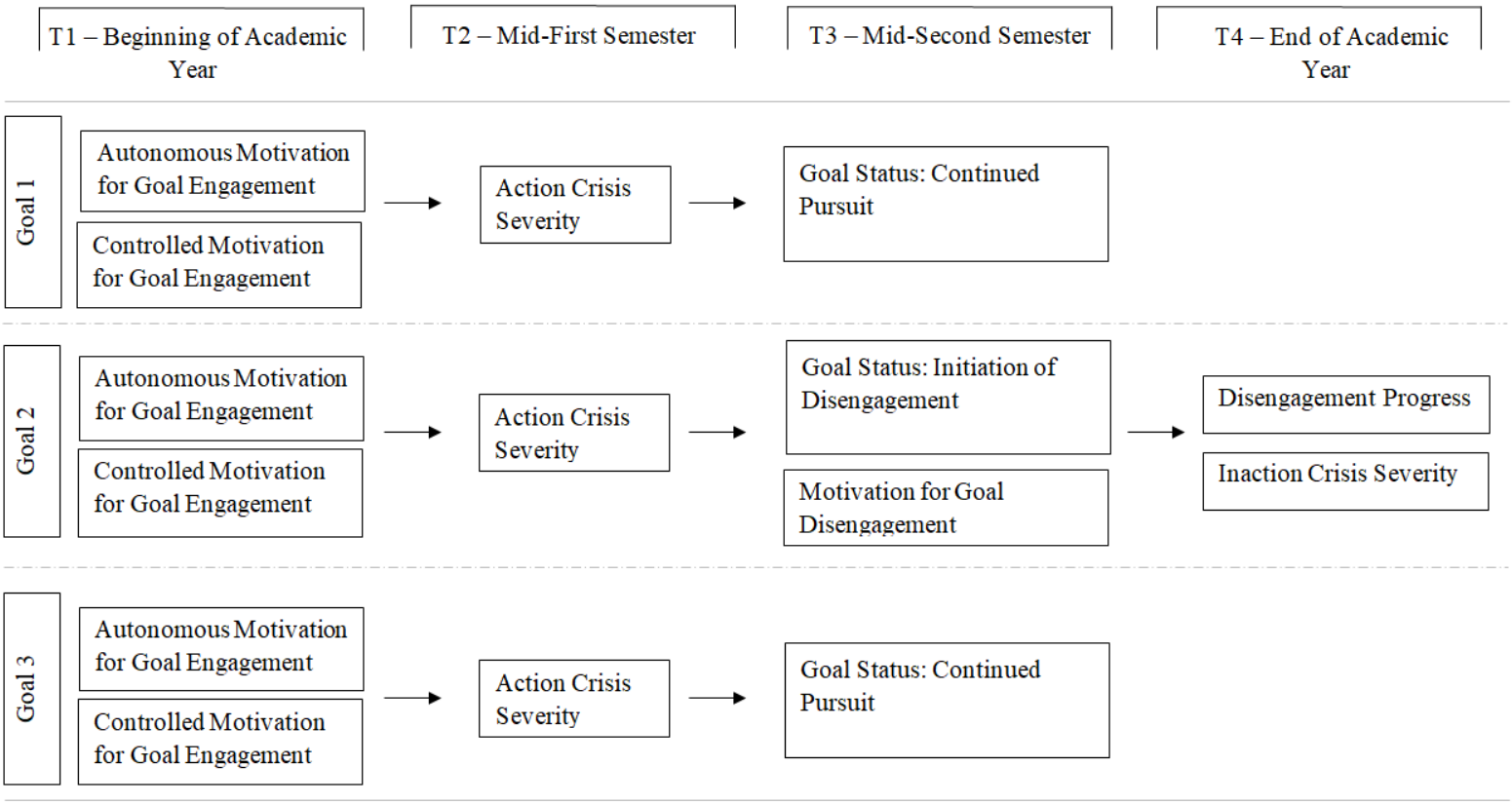
Study 2 test of indirect effects of autonomous motivation for disengaging on disengagement progress via inaction crisis severity in the community sample.



Note: The confidence intervals represent the 95% Cis, baseline controlled motivation controlled for in analysis.

Figure 3

Illustration of the longitudinal study design for Study 3 Sample A and B.



Note: This illustration of the study design for Study 3 depicts the assessment schedule for a participant who indicated she was disengaging from her second personal goal at T3.

General Discussion

"I believe it will have become evident why, for me, adjectives such as happy, contented, blissful, enjoyable, do not seem quite appropriate to any general description of this process I have called the good life, even though the person in this process would experience each one of these at the appropriate times. But adjectives which seem more generally fitting are adjectives such as enriching, exciting, rewarding, challenging, and meaningful. This process of the good life is not, I am convinced, a life for the fainthearted. It involves the stretching and growing of becoming more and more of one's potentialities. It involves the courage to be. It means launching oneself fully into the stream of life. Yet the deeply exciting thing about human beings is that when the individual is inwardly free, he chooses as the good life this process of becoming."

— Carl R. Rogers, On Becoming a Person: A Therapist's View of Psychotherapy

The quote above, authored by the father of humanist psychology, Carl Rogers, beautifully describes how human nature is inherently growth-oriented and guided by choice. The findings obtained in this doctoral thesis support Roger's proposition that individuals benefit from being inwardly free. The good life we strive for involves setting goals that reflect our core interests and values. However, even meaningful and positive goals can become strenuous and unattainable. In line with the quote above, letting go of valued goals is not for the faint-hearted. It involves the courage to stretch out of our comfort zone. While neither blissful nor enjoyable, the challenge of re-evaluating goals, overcoming inner conflicts, and setting goals free offers us an opportunity to launch into the ever-changing stream of life, to change and evolve.

Personal goals are ubiquitous - our lives are filled with goals that we have recently set, goals we are steadily progressing towards, or goals that we are in the painful process of relinquishing. Certain times of the year promote goal setting, such as the start of a new academic year or New Year. Changes in our life stage, career path, or relationship status can also bring about new goals. Meanwhile, certain conditions bring about doubt, uncertainty and a re-evaluation of goals, particularly when these become overwhelming, demanding, resource-intensive or unrealistic. Extraordinary circumstances, such as illness or loss of a loved one, may bring important goals to a shattering halt. However, for most goals, we do not have a clear roadmap delineating the best path forward when setbacks and difficulties set in (Brandstätter et al., 2013). We may feel torn, asking ourselves whether continuing with the goal is foolhardy or brave. Stuck in this dilemma, goals may percolate in an extended limbo, and slip through our fingers slowly, as the opportunities for goal attainment trickle away. At any given moment we may be holding on to several different goals, all in varying stages of progression or stagnation, that represent the different phases of the goal's lifecycle.

This thesis examined the role of autonomous and controlled motivation for goals throughout different phases of the goal's lifecycle. Findings from the five Articles reinforce earlier research that advocates for the importance of analyzing autonomous and controlled motives for goals separately (Judge et al., 2005; Koestner et al., 2008), as they are associated with different outcomes. Autonomous motivation appears to consistently optimize goal regulation, while controlled motivation promotes maladaptive self-regulation (e.g., inner conflict, psychological needs sacrifice) and is associated with worsening symptoms of mental health, physical health and increased stress.

Autonomous Motivation in the Goal's Life Cycle

During the goal engagement phase of goal striving, autonomous motivation facilitates goal progress. While the positive association between autonomous motivation and goal progress is firmly established (e.g., Koestner et al., 2008), the findings of Article 1 point to a novel mediator: protecting the goal from conflict and inertia (i.e., the action crisis). Specifically, we found that individuals tend to exert greater effort for their autonomous goals, which in turn makes these goals less susceptible to action crises. Our findings are consistent with previous research that has found that autonomous goals feel easier to pursue (Werner et al., 2016) and are less obstacle-ridden (Leduc-Cummings, et al., 2017). Future research is needed to integrate these findings. For example, it may be that autonomous goals are less likely to result in action crises precisely because they feel easier to pursue and are relatively free of obstacles. An alternative explanation may be that the construct of action crisis captures other established mediators, since items of the action crisis scale (e.g., "*So far my goal pursuit has been smooth and unproblematic*" Brandstätter et al., 2013) appear to indirectly measure obstacles and subjective ease of goal pursuit.

Moving past the action crisis, we found that autonomous motivation for goal pursuit was negatively associated with initiating disengagement following 6 months of active goal pursuit (Article 5). Perhaps the fact that autonomous goals are less problematic to the pursuer – as evidenced by less severe action crises – means there is less need to abandon these goals. Another explanation may be that because autonomous goals tend to be interwoven with a person's core values and interests they are less readily abandoned (Ryan, 1995). In general, this finding is thought provoking, because it can be interpreted through both lenses of the "disengagement paradox" (i.e., whether the tendency to disengage is good or bad; Carver & Scheier, 2000, p. 62).

Sheldon and Elliott's (1999) "integrated model of the conative process[11]" offers tentative support for the argument that the shielding of autonomous goals from disengagement impulses during goal engagement may be adaptive. Across three longitudinal data sets, Sheldon and Elliott (1999) found that individuals pursuing self-concordant goals (i.e., highly autonomous goals) were more likely to put effort into these goals, and to attain them. Results from Article 1 replicate these findings. Furthermore, Sheldon and Elliott (1999) found that the attainment of autonomous goals was more rewarding for the pursuer in terms of gains in well-being. These attainment-to-well-being effects were mediated by daily experiences of need satisfaction, such that individuals pursuing autonomous goals experienced more satisfaction of their needs for autonomy, competence, and relatedness during the period of goal striving. Thus, pursuing autonomous goals tends to be highly rewarding and results in enhanced well-being, which is congruent with our finding that autonomous goals are less likely to be abandoned 6 months following goal engagement.

However, future research is needed to investigate whether individuals pursuing autonomous goals are still less likely to initiate disengagement when it is clear that goal disengagement is warranted (e.g., when a goal becomes unrealistic or unattainable). Preliminary evidence from the athlete retirement study (Article 4) suggests that autonomous motivation for engaging with the goal does not impede disengagement when relinquishing the goal is warranted

[11] The conative process is defined by the authors as "the motivational sequence that begins at goal inception, continues through the period in which goals are pursued and either attained or abandoned, and has important ramifications for individuals' happiness and further motivation" (Sheldon & Elliott, 1999, p. 482)

(e.g., during athletic retirement), but future research is needed to replicate this finding in a fully prospective longitudinal study.

Once goal disengagement is initiated, a central finding of this thesis is that autonomous motives for disengagement facilitate disengagement progress, mirroring the positive effects observed for autonomous motivation in goal pursuit. We replicated this finding in professional athletes, university students, as well as a general sample of American adults. In addition, we found evidence that disengagement resulted in improved well-being (Article 4), which parallels Sheldon and Elliott's (1999) attainment-to-well-being effects during goal engagement.

Moreover, our results showed that a similar mechanism mediated the relation between both autonomous motives for goal engagement and progress (Article 1), and the relation between autonomous motives for goal disengagement and disengagement progress (Article 5, Studies 1-3). During goal engagement, the relative absence of action crises allowed more autonomously regulated goals to result in greater progress (Article 1). Similarly, the relative absence of "inaction crises" helped individuals distance themselves from their blocked goals during goal disengagement (Article 5, Studies 1-3).

Consistent with Klinger's (1987, p. 345) theorizing that "relinquished goals continue to carry an emotional charge. Old griefs remain ready to reemerge", we found evidence that internal conflict and doubts may precede the decision to disengage (action crisis– Article 1), but can also resurface or emerge once the decision to disengage has been taken *(*inaction crisis – Article 5, Studies 1-3*).* These internal conflicts and doubts interfered with goal attainment during the goal striving phase and impeded disengagement progress during the disengagement phase. Together, these findings underscore the benefits of anchoring decisions about goal engagement and goal disengagement firmly within one's own values, beliefs and priorities.

Controlled Motivation in the Goal's Life Cycle

While most research on goal motives and outcomes has relied on the motivation index to establish links between motivation and adjustment, results from this thesis uncovered the mental and physical health costs of controlled goal striving. Previous research provides support for the association between controlled motivation and ill-being, with a study on religious beliefs linking introjected motivation for one's religiosity with worsened well-being and mental health (Ryan, Rigby & King, 1993) and a study of junior athlete burnout linking perfectionistic tendencies and controlled motives to an increased risk of burnout (Jowett, Hill, Hall, & Curran, 2013)[12]. Likewise, perceived conflict between goals and ambivalence about goals has been previously associated with greater symptoms of ill-being (Emmons & King, 1988).

Our studies identified two pathways through which controlled motivation during goal striving was associated with increased distress and ill-being. Controlled goal motivation was consistently linked to more severe action crises during goal pursuit (Articles 1, 2, 5), which, in turn, were associated with increased symptoms of depression, biological stress, perceived stress and symptoms of poor health (Articles 1 and 2). Controlled motives also appeared to promote basic psychological need sacrifice during goal striving, which, in turn, was associated with

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[12] While perfectionism was not considered as an antecedent of controlled striving in this thesis, self-critical forms of perfectionism should be considered in future research given that self-critical perfectionism has been linked with a tendency towards more controlled goal striving (Moore, Holding, Hope, Harvey, Powers, Zuroff & Koestner, 2017).

increased psychological distress and hampered goal progress (Article 3). It seems cruel that the very goals individuals do not "want" in the first place – the goals pursued out of internal or external pressures – are associated with increases in psychological distress and ill-being.

However, future research is needed to investigate the directionality of these effects. For example, it is plausible that more vulnerable individuals, such as those experiencing a depressive episode or a stressful life event, gravitate towards more controlled goal striving. In tentative support of this hypothesis, a study by Emmons and King (1988) found that individuals with greater symptoms of depression were more likely to have conflicting goals than individuals with less symptoms of depression. Likewise, individuals may already be "in two minds" about a goal upon crossing the Rubicon, and this underlying action crisis may promote controlled goal striving.

Despite the tendency for controlled goals to be more beset with action crises (Article 1, 2, 5), controlled motivation for goal engagement did not promote goal disengagement (Article 5, Study 3). Instead, controlled motivation for goal engagement was positively correlated with controlled motivation for goal disengagement (Article 5, studies 3a & 3b). This suggests that once an individual feels controlled about pursuing a personal goal, the individual will likely continue to feel controlled about the goal when the goal is abandoned. Controlled motives for disengagement appeared to thwart disengagement progress (Article 5, Study 1 and 3b) and promote inaction crisis (Article 5, studies 1, 2, 3a & 3b), paralyzing controlled goals in a state of semi-detachment.

Thus, pursuing a controlled goal is an arduous journey marked by sacrifice and wrought with internal conflict. Moreover, it appears that controlled striving does not confer benefits in

terms of goal progress and is associated with increased stress and ill-being. This underscores the burden of both pursuing and abandoning goals for reasons not in harmony with one's authentic character.

Limitations and Future Directions

While the strengths of the studies of Articles 1 -5 include (1) large sample sizes, (2) prospective longitudinal designs, and (3) the inclusion of two non-college student samples, there are certain limitations to the present work. These limitations are (1) a lack of experimental design, (2) reliance on self-report assessment of key variables (Article 2 is an exception with the hair-cortisol sampling) and (3) lack of an objective assessment of goal's attainability.

Firstly, due to the lack of experimental design in our studies it is impossible to infer causality or rule-out third variables. In line with Sheldon and Elliott (1999), we are confident that the longitudinal, goal-based methodology we chose to test our questions is a powerful framework to study the naturally unfolding process of goal pursuit and goal disengagement. Importantly, since our models specify horizontal rather than vertical relations between variables (i.e., we predicted sequential relationships among variables over time as opposed to hierarchical relations between constructs), it would be difficult to test our questions in a laboratory setting. It would also be questionable, from an ethical point of view, to assign participants to an action crisis, need sacrifice, or goal disengagement condition. Nevertheless, specific aspects of the model could be experimentally manipulated. For example, future research would benefit from experimentally manipulating participants' motivation for goal engagement or goal disengagement and examining whether the effects reported here replicate in such settings.

While self-report remains an invaluable tool for assessing cognitions and subjective experiences, our reliance on self-report measures may have introduced biases such as

acquiescence (Winkler, Kanouse & Ware, 1982), a consistency motif (Osgood & Tannenbaum, 1955), socially desirable responding (Braun, Jackson & Wiley, 2001), or distorted self-perceptions, that resulted in systematic error. In addition, we cannot rule out that the observed effects may be due to shared method variance (Campbell & Fiske, 1959; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, longitudinal designs do overcome some shared method limitations through the temporal separation of survey assessments. Future research would benefit from incorporating other methods (e.g., experience sampling) and corroborating self-report assessments with information from other sources (e.g., informant reports). Indeed, in Article 2 we supplemented our assessment of self-reported stress with a more objective marker of stress (e.g., hair-cortisol), finding that both the subjective and biological marker of stress increased as a function of action crisis severity.

A third limitation of the present work was that we did not have an "objective" indication of the goal's attainability. Having a more objective indicator of the goal's attainability would allow us to examine if certain goals are abandoned prematurely, or other costly goals are retained for too long. Researchers working within the framework of the action-phase model of developmental regulation (Heckhausen, 2007; Wrosch & Heckhausen, 1999) can rely on "developmental deadlines" to determine goal attainability. The action-phase model extends the non-developmental Rubicon model (Gollwitzer & Heckhausen, 1987) by including the developmental deadline as a second motivationally relevant transition following the Rubicon. Particularly relevant for health and aging research, the deadline for action represents a point in time after which opportunities for goal success radically decline, and gives researchers the advantage of being able to rely on objective standards, such as a person's age, by which to judge a goal's attainability. For example, Heckhausen, Wrosch, and Fleeson (2001, p . 412) studied

disengagement in the context of women's "biological clock" for childbearing, arguing that "the deadline for this task is relatively uncontrollable, relatively nonnegotiable, and relatively narrow in terms of the number of years it spans".

While the action-phase model of developmental regulation is useful in the study of populations with clearly defined biological/developmental deadlines, it is harder to apply to studies examining disengagement from heterogeneous goals across the lifespan. One can argue that goals are generally subjective, and that an individual's perception of feeling stuck and inclined to abandon a goal are to be taken at face value. After all, the same goal of "Attaining a 3.5 GPA" or "Becoming a dentist" might be reasonable and attainable for one student and completely unrealistic and stress-inducing for another. Nevertheless, future studies would benefit from assessing participant appraisals of the goal's desirability and perceived attainability at different phases of its lifecycle.

Future studies could also improve upon the motivational model for goal disengagement by integrating the "conative process" into our model of disengagement (i.e., including both the motivation-to-disengagement as well as the disengagement-to-well-being links in the same model) (Sheldon & Elliott, 19990). These links have been tested separately in Articles 4 and 5 (i.e., athletes reported greater well-being when disengaging from their athletic careers, and individuals reported enhanced disengagement when disengaging for autonomous reasons), but it would be more rigorous to test both these links in the same structural equation model. Thus, in addition to tracking goals and motivation from goal selection to disengagement, it would be valuable to assess subjective well-being and depressive symptoms at different phases of the goal's lifecycle.

While the benefits of goal disengagement have been firmly established (Wrosch et al., 2013), the mechanisms that promote or hinder this goal process are only starting to be uncovered and there is much left to explore. This thesis focused primarily on the *motives* underlying goal pursuit and goal disengagement, but future research may benefit from investigating *goal contents* to understand whether certain features of the goal's content moderate the progression of goal disengagement. As such, incorporating SDT's Goal Contents or Basic Psychological Needs mini-theories (Ryan & Deci, 2017) into the study of goal disengagement may lead to interesting research questions, such as whether goals that represent "need substitutes", (i.e., highly extrinsic goals that provide limited need satisfaction; Vansteenkiste & Ryan, 2013) are more difficult to relinquish.

Given the importance of romantic partners and family members for the pursuit of personal goals (Fitzsimons, Finkel & vanDellen, 2015; Koestner, Powers, Holding, Milyavskaya, & Hope, 2020), future research would also benefit from examining the role of close others in action crises and goal disengagement. For example, recent research suggests that receiving autonomous support for one's goals seems to be especially helpful for goal attainment (Koestner et al, 2020; Koestner, Powers, Milvayskaya, Carbonneau & Hope, 2015). As such, future studies could investigate if autonomy support also facilitates resolving action crises and disengaging from blocked goals effectively. Relatedly, the motivation one has for being in a relationship with a close other also appears to affect goal progress. A recent dyadic longitudinal study by Holding, Barlow, Wrosch and Koestner (2019) uncovered that autonomous relationship motivation (i.e., person's willingness to wholeheartedly participate in the relationship) was positively associated with making progress on both goals pertaining to the relationship as well as self-oriented goals.

Future research could examine how relationship motivation impacts goal striving at later phases of the goal's lifecycle, especially if the blocked goal pertains to the relationship.

The findings of this thesis also point to the potential benefits of designing interventions aimed at enhancing autonomous motivation and internalizing controlled motivation. Such interventions may have significant clinical utility for practitioners helping individuals cope with demanding goal pursuit and life transitions. Results presented in this thesis suggest that many of the goal-related problems that individuals struggle with – whether caught in an action crisis, sacrificing basic psychological needs, or failing to disengage from an unattainable goal – are associated with the individual's goal-specific motivation. As such, interventions focused on internalizing motivation may be a promising approach to protect individuals from experiencing action crises in personal goal pursuit (Articles 1 & 2), from sacrificing basic psychological needs (Article 3), and helping individuals relinquish overly demanding goals (Articles 4 & 5). Autonomous motivation has already been identified as a common treatment factor in psychotherapy (Zuroff et al., 2007) with numerous studies finding that clients benefit more from psychological treatment when they feel autonomous about engaging in therapy. Building on the research by Zuroff and colleagues, it may be the case that clients benefit not only from feeling volitional about treatment, but also from feeling autonomous about the personal goals they set, pursue, and disengage from during therapy.

Final Conclusion

The studies presented in this thesis highlight the optimizing force of autonomous motivation at different stages of the goal's lifecycle: protecting goals from conflict and abandonment during goal engagement and facilitating the release of blocked goals during goal disengagement. Together, these five articles speak to the benefits of building bridges between

SDT and other motivation theories - integrating valuable perspectives from Life-Span, Rubicon and Goal Adjustment perspectives - to advance our understanding the role of motivation throughout a goal's lifecycle.

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