PSYCHOLOGICAL NEED SATISFACTION IN IMPORTANT LIFE DOMAINS.

Marina Milyavskaya

Department of Psychology
McGill University, Montreal
September 2011

A thesis submitted to McGill University Faculty of Graduate Studies and Research at in partial fulfillment of the requirements of the degree of Doctorate of Philosophy

© Marina Milyavskaya, 2011
# TABLE OF CONTENTS

Abstract.........................................................................................................................v

Résumé..............................................................................................................................vi

Acknowledgments............................................................................................................vii

Contribution of Authors.................................................................................................ix

Statement of Original Contributions...............................................................................xi

*Chapter 1:*

General Introduction.........................................................................................................1

  Psychological Need Satisfaction....................................................................................2

  Psychological Need Satisfaction and Motivation.........................................................7

  Psychological Need Satisfaction and Well-Being.......................................................11

  Psychological Need Satisfaction in Multiple Domains.............................................13

  Role of Domains.........................................................................................................15

  Between and Within-Person Variability.....................................................................16

  Present Work.............................................................................................................18

*Chapter 2:*

Psychological Needs, Motivation, and Well-Being: A Test of Self-Determination Theory Across Multiple Domains.................................................................19

  Abstract....................................................................................................................20

  Introduction...............................................................................................................21

  Method.......................................................................................................................26

  Results.......................................................................................................................29
**Discussion**

References.................................................................................................................33
Tables..........................................................................................................................42

**Bridge To Article 2** ...............................................................................................44

*Chapter 3:*

**Where Do Self-Concordant Goals Come From? The Role of Domain-Specific Psychological Need Satisfaction** .................................................................47

Abstract......................................................................................................................48
Introduction..................................................................................................................49
Study 1.........................................................................................................................61
Study 2.........................................................................................................................64
Study 3.........................................................................................................................71
Study 4.........................................................................................................................80
Study 5.........................................................................................................................90
General Discussion.....................................................................................................96
References..................................................................................................................107
Footnotes....................................................................................................................116
Tables.........................................................................................................................119
Figures.......................................................................................................................125

**Bridge to Article 3** ...............................................................................................129

*Chapter 4:*

**Balance Across Contexts: Importance of Balanced Need Satisfaction Across Various Life Domains** ...............................................................132
ABSTRACT

Although the importance of studying central constructs across different levels of experience has long been recognized, most research on psychological need satisfaction has focused on general need satisfaction or need satisfaction in specific, isolated domains or situations. The present thesis aims to address this problem by investigating the role of psychological need satisfaction in multiple domains simultaneously for motivational and well-being outcomes at different levels of generality, as well the interplay among domains. The first article examines the associations between psychological need satisfaction, autonomous motivation, and subjective well-being simultaneously across multiple domains. Results show that need satisfaction is strongly related to both autonomous motivation and well-being in multiple domains, and that motivation acts as a partial mediator of the path between need satisfaction and well-being. The second article investigates how domain need satisfaction influences the adoption of self-concordant goals, laying the foundation for successful goal pursuit. Both these articles use an idiographic approach to look at the differences and similarities between the many important life domains in which individuals are involved, and consider the within-person variability between domains. The third article directly looks at the effects of experiencing such variability on school and overall adjustment. Overall, the three articles reveal new information about the variability and relative role of psychological needs in important life domains obscured by the previous focus on global need satisfaction. These findings highlight the importance of examining psychological need satisfaction in multiple life domains.
RÉSUMÉ

Bien que l'importance d'examiner des concepts centraux dans différents niveaux d'expérience soit reconnue depuis longtemps, la plupart des études sur la satisfaction des besoins psychologiques mettent l'accent sur la satisfaction des besoins en général ou dans des domaines ou des situations isolés. Le but de la présente thèse était de remédier ce problème en examinant le rôle de la satisfaction des besoins dans plusieurs domaines simultanément ainsi que l'interaction entre les domaines sur la motivation et le bien-être à plusieurs niveaux de généralité. Le premier article examine les liens entre la satisfaction des besoins psychologiques, la motivation autonome et le bien-être subjectif simultanément dans de multiples domaines. Les résultats démontrent que la satisfaction des besoins est liée à la fois à la motivation autonome et au bien-être dans plusieurs domaines, et que la motivation agit comme un médiateur partiel de la voie entre la satisfaction des besoins et le bien-être. Le deuxième article examine la façon dont la satisfaction des besoins dans les domaines influence l'adoption de buts autonomes, établissant un fondement pour l'accomplissement des buts. Ces deux articles utilisent une approche idiographique pour examiner les différences et les similitudes entre les nombreux domaines importants et considèrent la variabilité intra-personnelle entre domaines. Le troisième article examine les effets de cette variabilité sur l'expérience scolaire et l’ajustement global. Ensemble, les trois articles révèlent de nouvelles informations sur le rôle des besoins psychologiques, soulignant l'importance d'examiner la satisfaction des besoins dans de multiples domaines.
ACKNOWLEDGEMENTS

I would first like to thank my supervisor, Richard Koestner, for showing me the true meaning of autonomy support. Thank you for always encouraging me to pursue my ideas and interests, however outlandish or farfetched they may have been. Your unwavering support and confidence in my abilities have helped me become a more creative and audacious researcher. I would also like to thank the other social area faculty members, Mark Baldwin, John Lydon, and Don Taylor, for your feedback and suggestions and for helping me develop how I think about research and improve as an academic.

I have been privileged to spend my years at McGill in the company of intelligent, resourceful and supportive social area graduate students and postdocs: Esther, Julie, Mike, Ben, Joy, Lisa, Carolyn, Sara E., Régine, Frank, Sara Q., Natsumi, and Sebastien, I have tremendously enjoyed and benefited from our interactions at Tupperware meetings and social student lunches. I am also grateful for my wonderful labmates, Gen Taylor, Natasha Lekes, Sook Chua, Fred Phillipe, and Nora Hope who have offered suggestions and insights on this and other projects. It was a pleasure working with and learning from all of you.

I would also like to thank all the people I have met and collaborated with outside of McGill University. This includes Rémi Radel, Daniel Nadolny, Stuart Daman, as well as many others who I have met at the Summer Institute of Social Psychology and at various conferences. I appreciated discussing research ideas and planning new projects with you – you have been a wonderful source of intellectual stimulation.
I would like to acknowledge the hard work of all the honours and research students and volunteers whom I have had the pleasure to co-supervise throughout my time at McGill. Some of them assisted with the data collection for the studies included in the present thesis, and many contributed innovative ideas and insights that have helped me improve my research. Although there are too many to name here, it was a privilege working with all of you.

I would also like to acknowledge the financial support I received from the Social Sciences and Humanities Research Council of Canada (SSHRC), the Faculty of Graduate Studies and the Department of Psychology of McGill University, and the Society for Personality and Social Psychology.

Outside of academia, I would like to thank my family and especially my parents for instilling in me the value of hard work and for your unconditional encouragement, love and support. Finally, to my husband Oren, thank you for listening to all the psychological jargon, for knowing how to make me laugh and smile when I was stressed, and most of all for your unwavering love and support.
CONTRIBUTION OF AUTHORS

The present thesis comprises three manuscripts. For all the manuscripts, I developed the ideas, conducted all the analyses, and wrote the initial draft. Richard Koestner, my co-author on all three articles, advised me in generating and developing the ideas presented in these articles, and assisted in editing and revisions. The first article, “Psychological Needs, Motivation, and Well-Being: A Test of Self-Determination Theory across Multiple Domains”, is published in the Journal of Personality and Individual Differences. This article is co-authored by myself and Richard Koestner. The second article, “Where do self-concordant goals come from? The role of domain-specific psychological need satisfaction”, has been invited for resubmission to the Journal of Personality and Social Psychology and is currently under review. It is co-authored by myself, Daniel Nadolny, and Richard Koestner. I coordinated the data collection and analysed all the data. Daniel Nadolny was involved in developing the ideas for studies 2 and 5, helped draft the introduction and discussion sections, and also with the editing and revisions. The third article, “Balance Across Contexts: Importance of Balanced Need Satisfaction Across Various Life Domains” is published in the Personality and Social Psychology Bulletin. It is co-authored by myself, Isabelle Gingras, Geneviève Mageau, Richard Koestner, Hugo Gagnon, Jianqun Fang, and Julie Boiché. Isabelle Gingras designed the larger study from which the data for studies 1 and 2 was used, and oversaw and coordinated all the data collection for those studies. Hugo Gagnon coordinated all the data collection for study 3. Jianqun Fang and Julie Boiché collaborated in collecting the data in China and
France, respectively. Genevieve Mageau was also directly involved with the planning of the original studies.
STATEMENT OF ORIGINAL CONTRIBUTION

Prior research on psychological need satisfaction has typically focused on global need satisfaction or need satisfaction in specific, isolated domains or situations. This thesis contributes to the existing literature by looking at the role of psychological need satisfaction in multiple domains simultaneously, thereby providing a comparison of the effects of need satisfaction across domains as well as an examination of the interplay among domains. In demonstrating that the effects on downstream outcomes differ based on domain, the present research opens the door for future research to investigate the specific features of a domain which could influence the magnitude of these effects.

A second contribution of this thesis was its focus on within-person variance in domain need satisfaction, which has never been investigated. The present research identified that a very large proportion of variance is within person (between domains), and directly tested the effects of having high variability. Using within-person analyses also tests the proposed effects of domain need satisfaction on important outcomes untainted by the effects of personality, which has not previously been possible using aggregated or global measures of need satisfaction, or conducting between-person analyses.

Another contribution of the present work was to identify domain need satisfaction as a precursor of setting self-concordant goals (Article 2). Although there is an extensive body of literature on self-concordant goals, no research has investigated the factors which influence the adoption of self-concordant goals. Article 2 identifies domain need satisfaction as an important factor in goal
adoption, using both experimental and prospective studies. Importantly, this research also shows that domain need satisfaction influences goal self-concordance both because in need-satisfying domains people are both more likely to choose the ‘best’ goal (among a set of comparable choices), and are more likely to see the personal relevance, interest and value of any goals set in the domain.
GENERAL INTRODUCTION

Researchers in psychology have long been aware that people show substantial variability across contexts or situations (Mischel, 1968). Indeed, this viewpoint has come to be integrated with earlier perspectives which considered the self as a stable structure (e.g., Allport, 1955). This integration can most commonly be found in hierarchical approaches which conceptualize the self as a construct existing at multiple levels of abstraction, including a global level as well as contextual and situational levels (e.g., McAdams, 1994; McConnell, 2011; Vallerand, 1997). Such hierarchical approaches highlight the importance of looking beyond the general or global level of analyses and focusing on contexts and situations to better understand people’s functioning including affect, cognition, and behaviours. Although the importance of looking at these variables across multiple levels is generally recognized within psychology, the extent to which this has actually been implemented has varied considerably. In particular, within research on psychological need satisfaction, studies typically examine either global need satisfaction or need satisfaction experienced in specific, isolated domains or in a given situation, drawing conclusions about the effects of need satisfaction without considering whether need satisfaction was measured at the global, contextual, or situational level. The present work seeks to address this concern by focusing on the role of need satisfaction at the contextual or domain level, examining the consequences of need satisfaction within important life domains, including an investigation of within-person variability. Using the framework of Self-Determination Theory (Deci & Ryan, 2000, 2008), this work
Chapter 1

will first review past research on psychological need satisfaction and its aftermath, and then focus on the importance of the contextual or domain level of analysis. Three articles comprising a total of 9 studies will then be presented, followed by a discussion of outstanding issues and future directions.

**Psychological Need Satisfaction**

Self-determination theory uses the concept of innate, universal, psychological needs to understand human motivation and development (Deci & Ryan, 2000, 2008). Unlike other theories which consider needs to be individual differences (e.g., McClelland, 1985), where people might experience different levels of a need such as a need for achievement or for power, self-determination theory views needs as nutrients that are universally required for psychological health (Deci & Ryan, 2008). The main question posed by self-determination theory concerns not the amount of a need, but the degree to which each need is satisfied for each individual. Three psychological needs are considered to be essential: the needs for autonomy, competence, and relatedness.

Autonomy refers to the experience of choice and personal endorsement of one’s activities and actions (deCharms, 1968; Deci & Ryan, 1985). People are autonomous when their behaviour is congruent with their personal enduring beliefs, values and interests. Importantly, autonomy can be distinguished from independence in that behaviours proposed or dictated by others can be personally endorsed and thereby autonomous (Iyengar & Lepper, 1999). Similarly, a person who is pressured into behaving ‘independently’ from others is not acting autonomously (Koestner & Losier, 1996), as can be seen in adolescents who resist
any attempt from their parents to influence their behaviours. Experimental studies have consistently shown benefits of autonomy for engagement, well-being, and adjustment, and research on naturally occurring environments that nurture or obstruct autonomous functioning has supported these findings (see Deci & Ryan, 2000; Ryan & Deci, 2006 for a review).

Competence refers to feelings of mastery over one’s environment and the ability to bring about desired outcomes (White, 1959). According to White, all human beings have an inborn propensity to explore, manipulate and attempt to control their environment. This is first evidenced in infants and very young children, and remains a driving force throughout the life span. People’s actual and perceived success and skill in such interactions defines their competence; when a person perceives themselves to be successful in exerting the desired effect on the environment, he or she feels a sense of competence. In both animals and humans, an inability to control one’s environment and outcomes leads to learned helplessness (Maier & Seligman, 1976). This has in turn been linked to depression and other maladaptive outcomes (e.g., Miller & Seligman, 1975).

Finally, relatedness reflects feelings of closeness and connection with significant others (Baumeister & Leary, 1995). As documented in the extensive literature on attachment, humans are predisposed to make social bonds from infancy (Bowlby, 1969). Such bonds form naturally and easily, but are often difficult to dissolve. According to Baumeister and Leary, people need both frequent interactions with others and for these interactions to take place in the context of stable and ongoing interpersonal relationships characterized by feelings
of care and intimacy. When a person experiences regular contact with others in the context of such caring relationships, their relatedness need is satisfied; this has been linked to positive psychological adjustment and physical health (e.g., Delongis, Folkman, & Lazarus, 1988; Lynch, 1979). Conversely, lack of attachments and loneliness has severe negative consequences on mental health and general well-being (Baumeister, 1991), as well as on physical health (e.g., the deterioration of the immune system, Kiecolt-Glaser, Garner, Speicher, Penn, & Glaser, 1984), and even mortality (for a review see Hawkley & Cacioppo, 2010).

In self-determination theory, these three needs are considered universal requirements or nutrients, akin to a plant’s requirements for sun, water, and soil to flourish (Deci & Ryan, 2000). This is a markedly different approach from other views on the concept of needs (e.g., McClelland, 1985; Murray, 1938), which conceptualize needs as ‘drives’ or ‘motives’. For example, Murray defined a need as a force which acts on the brain to influence perception and behaviour (Murray, 1938). By this definition, virtually anything that propelled a person to action could be considered a need, and indeed Murray identified 27 sets of universal behavioural motives including such motives as abasement and dominance. This view of needs as motives was further elaborated on by McClelland (1985), who asserted that there were individual differences in the extent to which specific needs or motives, such as need for achievement, affiliation, and power, drove people’s behaviours. However, although these motives are commonly seen in human behaviour, they are not actually necessary for individual growth and
thriving. Indeed, people are sometimes motivated to pursue certain things they do not truly need, such as greater accumulation of wealth and power, sometimes at the expense of other things they do need, such as meaningful personal relationships (see Sheldon, 2011 for a detailed discussion of distinguishing and integrating these two perspectives on psychological needs). Similarly, sometimes people are not motivated to pursue what they do need for optimal functioning (often because of a persistent lack of the satisfaction of a need), and instead focus on pursuing ‘need substitutes’ (Deci, 1980; Kasser, Ryan, Zax, & Sameroff, 1995).

Thus, unlike the needs-as-motives perspective, the needs-as-experiential-requirements view advanced by self-determination theory limits the psychological needs to autonomy, competence, and relatedness, which have reliably been shown to be necessary for psychological growth and well-being (see Deci & Ryan, 2000, 2008 for a review). Along with research on the outcomes of experiencing these three needs, research has shown that all three needs are implicated in satisfying and positive experiences (Sheldon, Elliot, Kim, & Kasser, 2001) across multiple cultures, pointing to the universality of these needs.

Research on the three needs has consistently found that all three needs are essential for motivation, well-being and other positive outcomes. Failing to satisfy any of the needs is thought to result in sub-optimal outcomes, akin to there being only one way to be healthy but multiple ways of being sick. Indeed, research which considered all three needs has found similar effects of the three needs on outcomes including life satisfaction, self-esteem, happiness, psychological well-
being, and depression, among others (Meyer Enstrom, Harstveit, Bowles, & Beevers, 2007; Niemiec, Ryan, & Deci, 2009; Vansteenkiste, Lens, Soenens, & Luyckx, 2006; Wei, Philip, Shaffer, Young, & Zakalik, 2005). Scales of satisfaction of the three needs are often highly correlated with each other (e.g., Gagné, 2003; Vlachopoulos & Michailidou, 2006). These similar effects and high correlations have led researchers to combine the three needs into one overall measure of need satisfaction. For example, overall need fulfillment at work has been linked with job satisfaction and other job-related outcomes (Vansteenkiste Neyrinck, Niemiec, Soenens, De Witte, & Van den Broeck, 2007), and general need satisfaction in relationships was shown to influence numerous indicators of individual and relational well-being (Patrick, Knee, Canevello, & Lonsbary, 2007). Alternatively, the three needs are often included as indicators of a latent construct of need satisfaction in measurement models, with the latent variable of overall need satisfaction then used in the structural part of the models (e.g., Deci et al., 2001; Niemiec et al., 2009). In the present studies, the tradition of combining these three needs was followed, both for the reasons outlined above and because of the focus on experiencing need satisfaction in specific domains rather than in general, which will be further discussed below.

Theories on the role of the needs have pointed to the importance of need satisfaction for both personality development (Sheldon, Cheng, & Hilpert, 2011), psychological well-being (Deci & Ryan, 2000; Sheldon et al., 2011), and motivation and behaviour (Deci & Ryan, 2000; Vallerand, 1997). Most of these models consider needs in general as universal requirements underlying the
aforementioned positive outcomes (e.g., Deci & Ryan, 2000; Sheldon et al., 2011). One exception is Vallerand’s hierarchical model of motivation, which posits need satisfaction as a proximal precursor of autonomous and controlled motivation and distal precursor of affect, cognition, and behaviours at three levels of specificity – the global (personality), life contexts/domains, and situational/state. Motivation at each level is thought to be a result of the extent to which social factors satisfy the basic needs at that level. In turn, the motivation at each level is expected to influence outcomes at that level, including affect, cognition and behavior. For example, a supportive work environment (at the domain level) would lead a person to experience psychological need satisfaction at work, and the person would be autonomously motivated to go to work, leading to better job performance and higher job satisfaction. Vallerand’s (1997) model draws attention to the importance of looking beyond general (global) need satisfaction and focusing on the contextual and situational levels in examining the role of psychological need satisfaction on motivation and well-being.

**Psychological Need Satisfaction and Motivation**

In self-determination theory, motivation is conceptualized as a continuum ranging from a motivation that is autonomous, originating within the self, to one which is controlled and stems from outside pressure (Deci & Ryan, 2008). The most autonomous form of motivation is intrinsic motivation, which is characteristic of engagement in a behaviour for the behaviour’s own sake. Intrinsically motivating behaviours are interesting and pleasurable, and do not provide any external benefits other than the enjoyment inherent in the activity.
Children who play and explore their environment for the joy and pleasure such experiences provide are said to be behaving for intrinsic reasons. This is the most self-determined type of motivation as it is thought to stem from the innate propensity of all humans towards exploration, spontaneous interest and mastery.

Outside of intrinsic motivation lies the motivation for most of the activities and behaviours in which people engage in their everyday lives. Activities such as doing the dishes, going to school or changing diapers are not inherently pleasurable, yet people still perform them willingly. These activities are necessary for some important outcome, and are termed extrinsically motivated — that is, they are not done for their own sake but because of the outcomes they help bring about. However, these activities can still be performed with various degrees of autonomy, which depends on the extent to which the value of the activity is internalized or integrated into the self.

The most autonomous type of extrinsic motivation is integration, when the importance of a behaviour is internalized to such a degree that it is integrated with other aspects of the self. For example, the father of a young child might gladly and willingly change the baby’s dirty diaper if he views his role as a father as an integral part of himself. In such a case, the behaviour is considered to be guided by integrated motivation.

In identified regulation, people internalize the importance and value of an activity or behaviour, and perform it volitionally because of this value. Someone who identifies with the importance of obtaining a good education will freely choose to pursue their education and to invest the time necessary to study and do
their homework. This type of regulation is said to be autonomous because it stems from within the self, and behaviours which are identified are more likely to be maintained, with people exhibiting greater commitment and performance. Together, intrinsic, integrated, and identified regulation comprise autonomous, or self-determined motivation.

The next type of regulation is *introjection*, which occurs when individuals internalize the external regulations without integrating them into the self. For example, someone who stays in a relationship because she would feel guilty if she were to leave is doing so because of introjection. This type of motivation involves internal rewards and punishments, and is characterized by having one’s self-worth contingent on the behaviours, including contingent self-esteem, shame, or guilt. While no longer outside the individual, introjection is nevertheless not truly part of a person’s core self, and is thus a non-self-determined (controlled) form of motivation.

The least autonomous form of extrinsic motivation is *external regulation*, when one does something because of external contingencies. People behave in a certain way to produce a desirable outcome or to avoid an undesirable one. Rewards, punishments, and threats are necessary to produce the behaviour, and if these would cease so would the behaviour. A child who cleans his room because his parents threaten to punish him if he fails to do so can be said to be externally regulated, and if the parents were out of town for a month or ceased to monitor the child’s activities, the room would most likely not get cleaned while they were away.
Although this continuum of autonomous motivation is typically used to describe people’s motivation for their behaviours, different terms have been applied when motivation is examined for other constructs. For example, in the literature on goals, the extent to which a goal is autonomous versus controlled has been termed self-concordance (Sheldon & Elliot, 2009), with goals that are congruent with one’s interests and values rather than pursued because of internal or external pressures deemed self-concordant.

According to self-determination theory, the most important ingredient in developing and maintaining intrinsic motivation or completely internalizing extrinsic motivation in a given context is the amount of psychological need satisfaction experienced in that context (Deci & Ryan, 2000). The process of internalization is particularly crucial given that most behaviours that are required to be functioning members of a society (e.g., being polite to others, going to school, refraining from engaging in unlawful or fraudulent activities) are not inherently intrinsically motivating. Engaging in and personally endorsing such behaviours and other societal values allows the individual to become socialized and integrated within society and the larger culture. Although all individuals can be said to have a “natural developmental tendency” (Deci & Ryan, 2000, pg. 238) towards internalization, parents and other societal agents (teachers, coaches, other relatives, friends, etc.) aid in this endeavour by supporting autonomy, competence, and relatedness, which are considered essential nutrients required for this process (Deci & Ryan, 2000). Indeed, numerous studies have shown that psychological need satisfaction experienced in a given environment or domain
influences people’s motivation for pursuing further activities in that domain. For example, children are more likely to internalize school-related behaviours when their parents and teachers are autonomy supportive (e.g., Chirkov & Ryan, 2001; Grolnick, Ryan & Deci, 1991). This has also been shown in the health care (Williams et al., 2006), sports (e.g., Gagné, Ryan, & Bargmann, 2003), and work (Baard et al., 2004) domains.

Psychological Need Satisfaction and Well-Being

In addition to being important for motivation, the satisfaction of the three basic psychological needs is considered essential for optimal psychological functioning (Deci & Ryan, 2008). To demonstrate this, researchers have linked need satisfaction to numerous indices of adjustment both in general and in various specific domains. Experiencing autonomy, competence and relatedness in one’s life has been linked with subjective well-being (including positive affect, negative affect, and life satisfaction; e.g., Sheldon & Tan, 2007; Sheldon et al., 2011), as well as experiences of growth, vitality (Ryan & Frederick, 1997), and self-actualization, which could all be conceptualized as eudaimonic well-being (Ryan & Deci, 2001). Experiencing need satisfaction is also related to better mental health, including lower depression (Wei et al., 2005). Conversely, need thwarting, or experiencing a lack of any of the three needs or conflict between the needs has been related to more negative outcomes, including psychopathology (Wei et al., 2005) and increased extrinsic aspirations (Kasser, Ryan, Zax, & Sameroff, 1995).
In addition to these general consequences of need satisfaction and need thwarting, research in multiple domains has demonstrated the positive effects of experiencing general need satisfaction in specific domains. Research in schools, organizations, and sports consistently finds that experiencing greater need satisfaction is related to increased performance, persistence and satisfaction. Furthermore, research has found that that daily variations in autonomy, competence and relatedness predicted fluctuations in daily well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In addition to this research which has investigated the consequences of experiencing general or global need satisfaction on outcomes at multiple levels of experience, research has also examined the consequences of experiencing need satisfaction in specific domains; this will be reviewed further below in the introduction.

In addition to the satisfaction of each individual need, the balance across the needs has been shown to influence well-being (Sheldon & Niemiec, 2006). In four studies, Sheldon and Niemiec showed that university students’ subjective well-being and happiness were influenced by the balance among the three needs, even after controlling for the level of satisfaction of each individual need. The rationale for those studies stemmed from prior research on personal variability and work/life balance. Indeed, prior studies have shown that variability both across contexts and across time to be detrimental for psychological well-being. For example, research has shown that people suffer when their self-concept is more variable across roles (Donahue, Robins, Roberts, & John, 1993), or when there are discrepancies between how others perceive them and how they see
themselves (Campbell, Assanand, & Di Paula, 2003). Rather than focusing solely on within-person variability, some research has turned to looking at people’s actual time investments and the balance of resource allocation to important domains or activities. Based on the scarcity hypothesis which posits that time and energy are limited resources that people must allocate to different activities in their lives (e.g., family, work, leisure, etc.), researchers have examined the consequences of an imbalanced allocation of these resources. Such research has shown that involvement in one activity or domain (e.g., work) affects perceptions of the extent to which this domain interferes with other domains (e.g., family), leading to lower satisfaction with the domain itself and with life in general (e.g., Adams, King, & King, 1996). Additionally, Sheldon, Cummins and Kamble (2010) showed this to be the case with two different measures of life-balance, such that both equitable time use across multiple domains and low subjective discrepancy between actual and ideal time use were associated with enhanced well-being. In their research, they also found that this was partly due to increased psychological need satisfaction resulting from living a more balanced life.

**Psychological Need Satisfaction in Multiple Domains**

Although the aforementioned research has focused on the overall, or global, satisfaction of the three needs, the research on life-balance highlights the importance of domain-specific experiences. Not surprisingly, a great deal of research has examined the effects of experiencing psychological need satisfaction in specific life domains. Indeed, domain-specific need fulfillment has been linked to positive outcomes in a variety of domains including greater vitality and lower
exhaustion and burnout in sports (Adie, Duda & Ntoumanis, 2008; Gagné et al., 2003; Perreault, Gaudreau, Lapointe, & Lacroix, 2007), persistence in school (Ratelle, Larose, Guay, & Senecal, 2005), job performance (Baard, Deci, & Ryan, 2004) and job satisfaction, vitality, and dedication (Vansteenkist et al., 2007), involvement in volunteer work (Gagné, 2003), and relationship satisfaction (Patrick et al., 2007), among others. These and countless other studies provide converging evidence on the importance of the need satisfaction across all life domains, and theoretically need thwarting in any social environment is expected to lead to negative outcomes (Deci & Ryan, 2008). However, neither the role of need satisfaction across multiple domains simultaneously, including the magnitude of effects across domains, nor the variability across domains have been thoroughly investigated. One study which assessed need satisfaction in separate contexts examined their effects on general well-being outcomes (Véronneau, Koestner, & Abela, 2005), showing that need satisfaction at school and at home, but not with friends, was related to fewer depressive symptoms both concurrently and prospectively six weeks later. Additionally, one study examined need satisfaction with diverse relational partners (i.e. mother, father, best friend, roommate, etc; LaGuardia, Ryan, Couchman, & Deci, 2000), linking need satisfaction in each relationship to attachment security in that relationship. While participants in that study reported significantly different levels of need satisfaction and attachment across relationships, whether the strength of the association between need satisfaction and attachment differed across relationships was not investigated.
Role of Domains

The importance of investigating need satisfaction in multiple domains is highlighted by the prevalence of other research on the role of multiple domains. Indeed, research on personality and the self-concept has long recognized the importance of domains and roles in the construction of personality and concepts of the self. According to developmental researchers (e.g., Harter, Bresnick, Bouchey, & Whitesell, 1997), children develop distinct self-concepts in different contexts or domains. This has also been addressed by Marsh (Marsh, 1990; Marsh & Hocevar, 1995), who has suggested a self-concept hierarchy where one’s general self-concept is comprised of non-academic and academic (reading and math) self-concepts which are independent of each other. Such separate, domain-specific self-concepts are likely to emerge at least partially as a result of the support for the needs available in each of these domains or environments. For example, a child whose feelings of competence and autonomy are undermined at school would be likely to develop a poor academic self-concept; this may be very different from his self-concept with friends.

Additionally, research in other diverse areas including attachment, well-being, quality of life, and motivation have all pointed to the importance of focusing on domains. For example, judgments of global well-being have been shown to be influenced by experiences in specific domains (see Schimmack, 2008). One meta-analysis has found that satisfaction in domains (including the
marital and job domains) are uncorrelated among themselves but moderately related to global life satisfaction, suggesting that satisfaction with each domain plays an independent and unique role in life satisfaction (Heller, Watson, & Ilies, 2004). Importantly, research on well-being has emphasized that a person must be engaged in multiple domains to truly live a fulfilling life, with extensive research on roles and domains linking certain roles to greater well-being. For example, experiencing normative experiences in school, occupational, relationship, and activities domains all positively contribute to different aspects of psychological well-being (Ryff & Heidrich, 1997). These and other studies point to the importance of understanding the role of need satisfaction not only in individual, specific domains as has been typically done by self-determination theory researchers thus far, but also the interplay of these domains with each other as well as similarities and differences in the effects of need satisfaction across domains.

**Between and Within-Person Variability**

One additional benefit of focusing on multiple domains is the possibility of examining the extent to which people report variability across the multiple contexts or domains in which they are involved. Understanding the source(s) of variability (within versus between person) can point researchers towards the level of analysis (global, contextual, or situational) at which need satisfaction can be most fruitfully examined. Finding that a large proportion of the variability is within person would emphasize the importance of looking within person at contexts and situations to better understand the construct of need satisfaction,
while a focus on trait or global-level determinants and consequences would be more appropriate if most of the variance was between-person. The proportion of variability at each level can also provide a clearer conceptualization of the origins of experiences of need satisfaction. Indeed, if there was little variability within person, then need satisfaction could be considered as a global construct, with some people experiencing greater need satisfaction and others less so. This could occur if psychological need satisfaction was most strongly affected by general personality traits. Indeed, some evidence for the role of personality in perception of need satisfaction has been shown in research on global causality orientations which represent the source of initiation and regulation of behaviour (Deci & Ryan, 1985) and affect the extent to which a person perceives experiences of autonomy, competence and relatedness in their environment (Baard et al., 2004). However, an abundance of research has also shown that experiences of need satisfaction are affected by specific environmental conditions and variables. This has commonly been examined in domain such as school, work, or sports, where it has been shown that teachers, employers and coaches who relate to their subordinates “by taking their perspective, encouraging initiation, supporting a sense of choice, and being responsive to their thoughts, questions, and initiatives” (Deci & Ryan, 2008) can enhance people’s experiences of need satisfaction in these domains. As these interpersonal climates can vary greatly between domains, it is likely that the need satisfaction experienced in these domains will also vary as a consequence. This suggests that there should be at least some variability in
domain need satisfaction due to these environmental supports; however the extent of this variability is currently unknown.

**Present Work**

In the present work, the effects of psychological need satisfaction are examined across multiple domains simultaneously, focusing specifically on the effects of domain need satisfaction on motivation and well-being outcomes. The first article provides an initial look at the role of need satisfaction for domain motivation and domain well-being in six different domains. The magnitude of the effects of need satisfaction is compared among domains, and the sources of variability are explored. The second article uses both experimental and prospective methods to show that domain need satisfaction influences the goals set in a domain, with important consequences for goal pursuit. This article highlights the benefits conferred by domains in which people experience need satisfaction, and demonstrates how need satisfaction can set the stage for an upward spiral of increased well-being. Finally, the third article directly examines the consequences of variability in need satisfaction across important domains for general and domain-specific adjustment.
Psychological Needs, Motivation, and Well-Being:
A Test of Self-Determination Theory across Multiple Domains.

Marina Milyavskaya* and Richard Koestner*

*Department of Psychology, McGill University, 1205 Dr. Penfield Avenue, Montréal, Quebec, Canada, H3A 1B1.
Abstract

The present investigation examined the associations between psychological need satisfaction, autonomous motivation, and subjective well-being simultaneously across multiple domains. Two hundred and three adults completed questionnaires about important life domains in which they were involved, resulting in ratings of over 800 domains. Results show that need satisfaction is strongly related to both autonomous motivation and well-being in multiple domains. Additionally, we demonstrate that motivation acts as a partial mediator of the path between need satisfaction and well-being. By using an idiographic approach, this study looks at the differences and similarities between the many important life domains in which individuals are involved. The current paper also supports the universality of SDT processes by assessing need satisfaction, motivation and well-being simultaneously in multiple life domains.

Keywords: self-determination theory, psychological needs, motivation, well-being, multiple domains.
Chapter 2                Psychological Needs Across Domains   21

Psychological Needs, Motivation, and Well-Being: A Test of Self-Determination Theory Across Multiple Domains.

1. Introduction

Throughout their lives, people enact various roles and pursue various goals through their engagement in a multitude of important life domains. However, not all these domains are experienced in the same way – some may be fulfilling whereas others are depleting. What determines whether one feels happy or energetic in a given domain? Research on self-determination theory (SDT; Deci & Ryan, 2000, 2008) has shown the importance of basic psychological need satisfaction for well-being and other positive outcomes (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). However, few studies have examined the relation of need satisfaction to well-being simultaneously across multiple life domains, or investigated a potential mechanism for this relation. In the present study, we assess whether the association of need satisfaction to well-being is consistent across important life domains, and test the proposition that autonomous motivation may act as a mediator of the path between need satisfaction and well-being.

1.1 Basic Psychological Needs

Self-determination theory conceptualizes psychological needs as essential nutrients that are required for optimal psychological growth and well-being (Deci & Ryan, 2000). The needs for autonomy, competence and relatedness are thought to be universal across people and cultures and applicable throughout all aspects of a person’s life. Autonomy refers to the experience of choice and volition in one’s
behaviour and to the personal authentic endorsement of one’s activities and actions. Competence involves the ability to bring about desired outcomes and feelings of effectiveness and mastery over one’s environment. Finally, relatedness reflects feelings of closeness and connection in one’s everyday interactions (Deci & Ryan, 2000).

Many studies have examined the relation of psychological need satisfaction directly to well-being, both in general and in specific contexts. General need satisfaction has been shown to predict well-being outcomes both between-persons, with people who report greater overall need satisfaction also reporting greater well-being (Reis et al., 2000; Véronneau, Koestner, & Abela, 2005), and within-person on a day to day basis, with daily fluctuations in need fulfillment predicting daily fluctuations in well-being (Reis et al., 2000). Domain-specific need fulfillment has also been linked to positive outcomes in a variety of settings including greater vitality and lower exhaustion and burnout in sports (e.g., Gagné, Ryan, & Bargmann, 2003), persistence in school (Ratelle, Larose, Guay, & Senecal, 2005), job performance (Baard, Deci, & Ryan, 2004), involvement in volunteer work (Gagné, 2003), and relationship satisfaction (Patrick, Knee, Canevello, & Lonsbary, 2007), among others.

1.2 Autonomous Motivation as Mediator

While it is reasonable to expect that the experience of autonomy, competence and relatedness leads directly to well-being, it is also possible that some intervening variable is mediating the effect. One potential mediator which may link need satisfaction in a particular domain to well-being in that domain is
the reason for which this domain is pursued – i.e., the motivation. Self-determination theory often considers the role of motivation as predictor of important outcomes, and has also frequently linked motivation with need satisfaction. It is therefore reasonable to explore the possible mediating relations between need satisfaction, motivation and well-being outcomes in an effort to unify these separate aspects of the theory.

In SDT, motivation is conceptualized as a continuum ranging from a motivation that is autonomous, originating within the self, to one which is controlled and stems from outside pressure (Deci & Ryan 2008). Moreover, the extent to which an activity is integrated into the self is influenced by experiences of need satisfaction or need thwarting (Deci & Ryan, 2000). A domain in which a person experiences adequate support for autonomy, competence and relatedness should thus be associated with more autonomous motivation for participating in that domain, whether it is a hobby, a relationship, school, work, or any other area in which a person may be involved. Previous research has examined this proposition in some specific domains, showing that parental support for psychological needs was positively associated with children’s autonomous motivation for schoolwork (Grolnick & Ryan, 1989), and teacher’s support of these needs was linked to more autonomous motivation in medical students (Williams & Deci, 1996).

Autonomous motivation has in turn been associated with numerous positive outcomes, including greater creativity (Koestner, Ryan, Bernieri, & Holt, 1984), persistence at school (Vallerand, Fortier, & Guay, 1997), healthier
lifestyles and eating behaviour (Pelletier, Dion, Slovenic-D’Angelo, & Reid, 2004) and more positive psychotherapy outcomes (Zuroff et al., 2007). There is thus ample evidence suggesting both that need satisfaction leads to autonomous motivation, and, in a separate set of studies, that autonomous motivation leads to positive outcomes.

Some researchers have begun to test this idea of mediation in specific domains. For example, in the sports domain, motivation has been shown to mediate (at least partially) the link between need satisfaction and a variety of outcomes including affect, effort, further participation intentions, and drop-out (Ntoumanis, 2005; Sarrazin et al., 2002). In the relationship domain, Patrick and colleagues (2007, study 3) tested a mediation model where relationship motivation mediated the path between need satisfaction within the relationship and relationship satisfaction and commitment after disagreements, and found evidence for full mediation. While these studies represent an important contribution to understanding the mechanism through which need satisfaction leads to positive outcomes, it was only examined separately in each of these domains. Our research extends these studies by examining this path simultaneously in multiple contexts to test the hypothesis that these processes operate in a similar fashion in a variety of important life domains.

1.3 Multiple Domains

One of the basic premises of SDT is that it applies universally across cultures and domains. Previous research has confirmed that the key processes theorized by SDT are universal across cultures (e.g., Sheldon et al., 2004).
However, in order to be truly universal, a theory needs to apply not only across multiple cultures, but also across multiple contexts. While research on self-determination theory has been conducted in numerous domains including relationships, sports, school, work, leisure, and many others, virtually no studies have examined multiple domains simultaneously, comparing the strength of the links between need satisfaction, autonomous motivation and positive outcomes across domains. Although SDT expects that need thwarting in any social environment will lead to negative outcomes (Deci & Ryan, 2008), the magnitude of the effects across environments or domains has not been thoroughly examined. Two studies which assessed need satisfaction in separate contexts examined their effects on general well-being outcomes (Milyavskaya et al., 2009; Véronneau et al., 2005). Additionally, one study examined need satisfaction with diverse relational partners (i.e. mother, father, best friend, roommate, etc; LaGuardia, Ryan, Couchman, & Deci, 2000), linking need satisfaction in each relationship to attachment security in that relationship. While participants in that study reported significantly different levels of need satisfaction and attachment across relationships, the authors did not investigate whether the strength of the association between need satisfaction and attachment differed across relationships.

1.4 Present Study

In the present study we sought to address the aforementioned questions regarding need satisfaction in various life contexts and the mechanism through which need satisfaction can impact domain well-being. Over two hundred
participants indicated between 3 and 6 domains in which they were involved and rated each domain on measures of need satisfaction, motivation and well-being. We first tested the strength of the relation of need satisfaction to motivation and well-being and whether these relations vary across domains. While previous studies have shown need satisfaction in different domains to be differentially associated with well-being outcomes (e.g., Milyavskaya et al., 2009), those studies examined general rather than domain-specific well-being. As predicted by SDT, we hypothesized that need satisfaction in a domain would be strongly associated to both motivation and well-being in that domain and that this would be true across all domains. Secondly, based on the theoretical link between need satisfaction, motivation and well-being described above, we hypothesized that motivation for each domain mediates the relationship between need satisfaction and well-being.

2. Method

2.1 Participants and Procedure

Participants were recruited through online classified ads and through a Facebook event, and offered a 10$ gift card to amazon.ca for completing an online survey about important life domains. Two hundred and eighteen adults responded to the survey. As the survey was expected to take approximately 30-45 minutes, we removed all respondents who completed the survey in less than 20 minutes (N=10). We also removed 5 participants who either rated the same domains twice or left some of the measures entirely blank. The final sample consisted of 203 adults (62.6% female; 2 participants did not indicate gender)
ages 18-71 ($M = 24.55$, $SD = 7.03$). Under occupation, 50% of the sample indicated they were students; 8% were graduate students, 35% indicated a job, and 8% did not indicate an occupation.

Participants completed some general questionnaires and then were asked to think about three to six domains: “For the next set of questions, you will be asked about some life contexts, or domains in which you spend your time. Examples of a life domain can include school, work, family, a relationship, friends, sports (e.g., basketball, yoga, skiing, going to the gym, golf, etc.), hobbies (e.g., playing a musical instrument, painting, gardening, etc.), religious or community organizations, volunteering, etc.” Participants were then asked to name the domains in which they were involved and completed measures for each of these domains.

2.3 Measures

*Domain need satisfaction.* A 24-item scale was adapted from previous scales of need satisfaction (Gagné, 2003; LaGuardia et al., 2000) to assess competence (e.g., “In this domain, I feel like a competent person”), relatedness (e.g., “I feel that the other people in this domain sincerely care about me”), and autonomy (e.g., “I am free to express my ideas and opinions in this domain”) in each domain. Responses were made on a 7 point scale, ranging from 1 (*not at all true*) to 7 (*completely true*). As we were interested in need satisfaction in general, we averaged all the items to form one measure of overall need satisfaction in the domain. This scale had a high reliability $\alpha = .92$. 
Domain Motivation. Respondents’ motivation for participating in each domain was measured using a 4-item scale adapted from Sheldon and Elliot (1999). Participants were asked to rate the extent to which they are involved in each domain for intrinsic (“Because of the enjoyment or stimulation that this domain provides me”), identified (“Because I really identify with this domain”), introjected (“Because I would feel ashamed, guilty, or anxious if I was not involved in this domain”), and extrinsic (“Because of external rewards such as money, or because someone else wants me to do it”) reasons. These items were combined into a single relative autonomy index by using the following formula: 2*intrinsic + identified – introjected – 2*extrinsic (Ryan & Connell, 1989).

Domain Subjective Well-being. Participants completed the seven-item subjective vitality scale (Ryan & Frederick, 1997) which assessed the degree to which they felt physically and mentally vigorous and alert in that domain (e.g., “I feel energized in this domain.”). Additionally, participants completed a nine-item scale of affect (Emmons, 1992) which included 4 positive (e.g., joyful) and 5 negative (e.g., frustrated) items. Participants rated each item based on how they typically felt when they were engaged in that particular domain. All responses were made on a scale of 1 (not at all true) to 7 (very true). The reliability for each measure was $\alpha = .92$ for positive affect, $\alpha = .88$ for negative affect, and $\alpha = .94$ for vitality. As subjective well-being is commonly operationalized by aggregating multiple indicators (e.g., Reis et al., 2000), a composite measure of domain well-being was created by taking a mean of the standardized scores for each scale (with
negative affect reverse-scored). The correlation of these measures among themselves (.52 to .82, \( p < .001 \)) was sufficient to warrant combining them.

3. Results

3.1 Preliminary Analyses

Participants indicated three to six domains in which they were involved (median = 4; total of 863 domains). These domains were examined and coded into 6 categories by two independent raters. The categories were family, friends, romantic relationship, work, school, and activities/leisure. Domains which were unclear or ambiguous (e.g., ‘home’; ‘restaurant’ ‘taking care of others’) and those which were missing ratings on any of the key variables were removed from the analyses, resulting in a final sample of 826 domains. Agreement between the two raters was high, kappa = .99, \( p < .001 \), and cases of disagreement were discussed until an agreement was reached so that each domain was assigned a category. Some participants listed more than one domain which was coded in the same category (e.g., playing sports and watching TV both coded as activity/leisure; having two part-time jobs both coded as work). Table 1 shows the mean need satisfaction, motivation and well-being by type of domain. Participants reported the highest need satisfaction and the most autonomous motivation with friends and in relationships, and the least need satisfaction, motivation and well-being at work and at school.

To account for non-independence of each domain rating, we used hierarchical linear modeling (HLM) for our data analysis. HLM is a technique that takes into account similarities of observations within individuals and allows
for a different number of observations for each individual. The HLM software, version 6.06, was used to conduct these analyses using full maximum likelihood estimation. To examine the role of each type of domain separately, we dummy-coded each domain type and included the interaction between the dummy-code and need satisfaction, so that for each domain that a person indicated the measure of need satisfaction takes into account the domain type that is represented. All variables were standardized prior to running the central analyses to allow for an easier comparison among variables.

To ensure that participants were really responding to each domain separately, we computed intraclass correlations (ICC) for our three main variables. The ICC represents the proportion of variance in outcome between participants (rather than between domains). HLM analyses of an empty model predicting need satisfaction, motivation, and well-being were, respectively, 0.19, 0.03, and 0.16. This means that 81% of the variance in need-satisfaction, 97% of the variance in motivation, and 84% of the variance in well-being was between domains.

3.2 Predicting Motivation from Need Satisfaction

To test our first hypothesis that need satisfaction would be positively associated with autonomous motivation in all domains, we first computed a model which included the type of domain (dummy coded for each domain – D1 to D6) and the interaction between each domain type and need satisfaction (ID1NS to ID6NS). The equation of autonomous motivation in each context was as follows:

\[ \text{Domain motivation} = \beta_0 + \beta_1(D1_j) + \beta_2(D2_j) + \beta_3(D3_j) + \beta_4(D4_j) + \beta_5(D5_j) + \]
\[ \beta_6(D6_j) + \beta_7(ID1NS_j) + \beta_8(ID2NS_j) + \beta_9(ID3NS_j) + \beta_{10}(ID4NS_j) + \beta_{11}(ID5NS_j) + \beta_{12}(ID6NS_j) + \varepsilon_{ij} \]. As we included all 6 domain dummy-codes in the equation, we removed the fixed portion of the person-level intercept but allowed the intercept to vary (\( \beta_{0j} = u_{0j} \), where \( u \) is error). All other effects were fixed.

Overall, need satisfaction explained 40% of the variance in autonomous motivation between domains for each participant. The coefficients for need satisfaction in each domain were significant (see table 2), although the magnitude appeared to vary somewhat between domains. To test whether these differences were statistically significant, we compared the above model to a model which constrained all the coefficients of need satisfaction by domain to equal each other (\( \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = \beta_{12} \)). This model provided a better fit, suggesting that there were no significant differences in the effects of need satisfaction across domains, \( \chi^2(5) = 6.80, p >.2 \). A non-significant \( \chi^2 \) signifies that the simpler model (in this case the second model assessed) was a better fit.

### 3.3 Predicting Well-Being from Need Satisfaction

We next assessed whether need satisfaction is similarly associated with well-being across all domains. We estimated the same model as above to predict domain well-being. All the coefficients for need satisfaction in each domain were significant. Results for this model are shown in table 2. Overall, need satisfaction accounted for 51% of the variance in well-being between domains for each participant. To test whether these coefficients were significantly different from one another we compared the above model to a model which constrained all the coefficients of need satisfaction by domain to equal each other. This model
provided a worse fit, suggesting that there were significant differences in the effects of need satisfaction across domains, $\chi^2(5) = 54.67, p < .001$. Additional exploratory analyses showed that need satisfaction plays a similar role in family, school, work and relationship domains and a smaller effect in friendship and activity domains.

### 3.4 Testing for Mediation

We next tested our second hypothesis, that the relationship between need satisfaction and well-being in each domain was mediated by autonomous motivation. As all our main effects in the model were fixed, the steps for testing mediation in HLM are similar to those used to test a traditional mediation model, as described by Baron and Kenny (1986). Since we already showed that domain need satisfaction predicted both domain well-being (our outcome variable) and domain motivation (mediator variable), the final step was to test whether autonomous motivation predicted well-being even when we controlled for domain need satisfaction, and whether the direct path between need satisfaction and well-being became non-significant when we included the mediator in the model. We re-ran the above model with well-being as the dependent variable and included domain motivation (DMOT). At level one, the following equation was used:

\[
\text{Domain well-being} = \beta_0 + \beta_1(\text{DMOT}_j) + \beta_2(\text{D1}_j) + \beta_3(\text{D2}_j) + \beta_4(\text{D3}_j) + \beta_5(\text{D4}_j) + \beta_6(\text{D5}_j) + \beta_7(\text{D6}_j) + \beta_8(\text{ID1NS}_j) + \beta_9(\text{ID2NS}_j) + \beta_{10}(\text{ID3NS}_j) + \beta_{11}(\text{ID4NS}_j) + \beta_{12}(\text{ID5NS}_j) + \beta_{13}(\text{ID6NS}_j) + \epsilon_{ij}. \quad \text{All other effects were fixed.}
\]

Analyses showed that autonomous motivation had a significant effect on domain well-being even when we controlled for need satisfaction, $\beta_1 = 0.39$, 

However, the direct paths of need satisfaction in each domain to well-being were still significant (see table 2), showing that these effects were not fully mediated by motivation. Although there was no full mediation, since the coefficients of need satisfaction were reduced, we tested the mediation path to see whether there was partial mediation. Following Krull and MacKinnon (2001), we performed a Sobel test of mediation using the coefficients of need satisfaction on well-being from the model predicting the mediator and the coefficient of motivation on well-being from the final model. The Sobel test indicated that the mediation path was statistically significant for all domains, $zs = 5.24$ to $9.40$, all $ps < .001$ (see table 2). This suggests that the effect of need satisfaction on well-being was partially mediated by motivation.

4. Discussion

Self-determination theory has long recognized that the basic psychological needs of autonomy, competence, and relatedness are necessary for optimal functioning and for the integration of social norms and values in every life context (Deci & Ryan, 2000). This study examined the relation of these needs to autonomous motivation and well-being in important life domains, finding that need satisfaction was significantly related to both variables across domains. Importantly, we used an idiographic approach where participants were asked to name and rate domains important to them rather than rating categories set by the researcher. The results thus provide concrete evidence to support SDT’s proposition that need satisfaction is universally important across domains. Although such consistency has been previously demonstrated across diverse
cultures and developmental periods, our research is the first to explore SDT’s universality assumption across domains. It will be important to more carefully explore this issue by developing stronger research designs that include peer-report measures and prospective longitudinal designs. If the connections between need satisfaction, motivation, and domain well-being can be demonstrated using such designs, this would represent very strong evidence for the universal applicability of this model across domains. Of course, such rigorous tests of the SDT universality propositions have not yet been confirmed with regard to cultural or developmental variations.

Our second hypothesis that motivation mediates the link between need satisfaction and well-being was not fully supported, although we did find evidence of partial mediation. This suggests that there are multiple mechanisms through which need satisfaction leads to positive outcomes. Indeed, it is possible that feeling that one’s needs are satisfied in an important life domain is energizing in itself, and thus no mechanism is required to explain this connection. However, as we found the mediation path in our study to be significant, this supports our expectations that in addition to being beneficial in its own right, part of the positive effects of need satisfaction is the role it plays on motivation, which then leads to greater well-being. Overall, the partial mediation suggests that need satisfaction plays a dual role, acting both directly and indirectly on well-being outcomes. This fits well with previous theorizing on the role of the needs. In their seminal paper, Deci and Ryan (2000) predicted “that fluctuations in need satisfaction will directly predict fluctuations in well-being.”, whereas Vallerand
(1997) expected that the needs operate by influencing motivation which in turn influences specific outcomes. Our research supports both these arguments.

An alternative explanation for our findings, which would make the directionality of the effects of need satisfaction, motivation and well-being particularly difficult to disentangle, is that these variables feed into each other, forming a cycle or spiral. Indeed, it is possible that experiencing need satisfaction in a domain leads to more autonomous motivation, and then autonomous involvement in a domain leads to more experiences of need satisfaction and greater well-being. A similar proposal has been made by Sheldon and House-Marko (2001), who showed that setting self-concordant (i.e. autonomous) goals resulted in greater goal attainment, which in turn lead people to set and attain more self-concordant goals in the future, thereby enhancing well-being.

Although our model and analysis are theoretically grounded, it is important to exercise caution when applying causal models to data collected at a single time point. The mediation pathway specified in our second hypothesis implies causality (i.e., that need satisfaction causes autonomous motivation which in turn causes well-being), and longitudinal studies need to be conducted to statistically test its validity. The current analyses suggest that the proposed relationship linking the three variables of interest does exist, but further studies are needed to confirm these findings. Additionally, our measure of well-being consisted of only vitality and affect, and the effects may differ on other outcome measures. Another important limitation to our study is the classification of the domains. Participants were not asked to rate each potential domain, but only to
nominate some that were important to them, with their answers later classified to fit 6 general domains. This is especially problematic for the resulting category of ‘activities’, which encompasses such different things as sports, volunteering, or watching TV, all of which could be experientially different and distinct from each other and could potentially either differ more or be more similar to other domain categories. Future research is needed to better understand the domains that people find important, their experiences in these domains, and how these activities can be classified.

Overall, this study shows that need satisfaction is universally linked to motivation and well-being across important life domains. The quality of one’s engagement in important domains, as well as the affective outcomes in these domains are all associated with the amount of psychological need satisfaction experienced in these contexts.
References


Table 1

*Means and Standard Deviations of Study 1 Variables across Domains*

<table>
<thead>
<tr>
<th>Domain</th>
<th>N</th>
<th>Need Satisfaction Mean(SD)</th>
<th>Autonomous Motivation Mean(SD)</th>
<th>Well-being Mean(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>96</td>
<td>5.33$^b$(1.16)</td>
<td>5.54$^a$(5.47)</td>
<td>-.17$^a$(.97)</td>
</tr>
<tr>
<td>Friends</td>
<td>101</td>
<td>5.80$^b$(.73)</td>
<td>8.38$^b$(3.50)</td>
<td>.43$^b$(.51)</td>
</tr>
<tr>
<td>Relationship</td>
<td>56</td>
<td>5.94$^b$(.85)</td>
<td>8.80$^b$(4.13)</td>
<td>.41$^b$(.84)</td>
</tr>
<tr>
<td>School</td>
<td>109</td>
<td>4.48$^c$(.97)</td>
<td>2.64$^c$(5.29)</td>
<td>-.58$^c$(.87)</td>
</tr>
<tr>
<td>Work</td>
<td>146</td>
<td>4.52$^c$(.86)</td>
<td>-.40$^d$(5.06)</td>
<td>-.59$^c$(.80)</td>
</tr>
<tr>
<td>Activities</td>
<td>318</td>
<td>5.02$^d$(.85)</td>
<td>6.98$^c$(4.31)</td>
<td>.31$^b$(.66)</td>
</tr>
</tbody>
</table>

Note: different subscripts within each column signify that the means are significantly different from each other.
Table 2

*Coefficients of Need Satisfaction in Life Domains on Study Outcomes*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Autonomous motivation</th>
<th>Well-being</th>
<th>Well-being after controlling for motivation</th>
<th>Sobel z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(SE)</td>
<td>t(814)</td>
<td>β(SE) t(814)</td>
<td>β(SE) t(813)</td>
</tr>
<tr>
<td>Family</td>
<td>.65(.05)</td>
<td>12.35</td>
<td>.84(.05) 16.86</td>
<td>.57(.05) 11.76</td>
</tr>
<tr>
<td>Friends</td>
<td>.52(.08)</td>
<td>6.32</td>
<td>.56(.08) 7.23</td>
<td>.35(.07) 4.95</td>
</tr>
<tr>
<td>Relationship</td>
<td>.54(.09)</td>
<td>5.70</td>
<td>.95(.09) 10.75</td>
<td>.74(.08) 9.07</td>
</tr>
<tr>
<td>School</td>
<td>.68(.06)</td>
<td>11.51</td>
<td>.88(.06) 15.88</td>
<td>.61(.05) 11.25</td>
</tr>
<tr>
<td>Work</td>
<td>.60(.06)</td>
<td>10.43</td>
<td>.83(.05) 15.26</td>
<td>.58(.05) 11.22</td>
</tr>
<tr>
<td>Activities</td>
<td>.54(.04)</td>
<td>13.33</td>
<td>.52(.04) 13.78</td>
<td>.31(.04) 8.11</td>
</tr>
</tbody>
</table>

Note: All coefficients significant, p<.001
Bridge to Article 2

The first article presented initial evidence for the importance of focusing on psychological need satisfaction within important life domains. Within-subject analyses conducted as part of Article 1 showed that 81% of the variance in need satisfaction was within-person, between a person’s various domains. This suggests that in focusing on global need satisfaction or on only one domain, as is most commonly done in self-determination theory research, important information is lost. Article 2 builds upon these findings by focusing on how goal pursuit in a given domain is influenced by the need satisfaction experienced in that domain. The studies in Article 2 include a multitude of important life domains and use experimental and longitudinal designs to better understand the causal effects of domain need satisfaction.

Article 1 explored the effects of domain need satisfaction on two outcomes, motivation for engaging in the domain and domain well-being. In Article 2, the focus is extended to examine the consequences of domain need satisfaction for the goals set in important life domains, including how these goals are set and pursued. A crucial aspect of goal pursuit concerns people’s reasons for setting and pursuing their goals. Just as motivation for a behaviour is thought to span a continuum from autonomous to controlled (Deci & Ryan, 2000), people’s motivation for pursuing their goals can range from autonomous (pursuing a goal because of interest or personal importance) to controlled (pursuing the goal because of feelings of obligation, guilt or shame, or because an external force is compelling the person to pursue this goal). This property of a
goal has typically been referred to as goal self-concordance (Sheldon & Elliott, 1999), with goals that are pursued for more autonomous (compared to controlled) reasons termed more self-concordant. Although goal self-concordance concerns the motivation, or self-regulation of goal pursuit, this is different from motivation for engaging in the domain itself, as someone could enjoy going to work (autonomous motivation for engaging in domain) but set a goal of completing a certain project by a given deadline because their manager compelled them to do so (controlled motivation for goal). Goal self-concordance has been shown to influence goal pursuit by leading to greater effort expanded on pursuing the goal, increased persistence on goal-related activities, and finally greater likelihood of goal attainment (Sheldon & Elliott, 1999, Sheldon & Houser-Marko, 2001).

However, this prior research combined multiple goals or strivings to examine the effects of general, rather than goal-specific self-concordance. In Article 2, the effects of domain need satisfaction on goal self-concordance and goal attainment are examined for specific goals set in important life domains.

Some of the limitations in Article 1 are also addressed in Article 2. Perhaps the most important limitations are the correlational design of the study, and its exclusive reliance on self-report. Although theoretically domain need satisfaction was expected to causally influence domain well-being, such a relationship cannot be determined in a correlational study where all the measures are administered simultaneously. Additionally, the use of self-report for all the variables can inflate the relationships as it may be influenced by report bias. In order to address these limitations and explore the causal effects of need
satisfaction on outcome variables, Article 2 incorporates longitudinal studies, including a week-long daily diary study (Study 2) and two semester-long studies (Studies 3 and 4). Additionally, two of the studies experimentally manipulated the nature of the domain, asking participants for domains in which their needs were either satisfied or thwarted (Studies 2 and 5). Such a procedure is optimal for testing causation while also reducing potential error due to self-report. To further ensure that the findings are not uniquely due to self-report, Study 4 also incorporates friend’s ratings of goal self-concordance.

Finally, in Article 1, the relationship between domain need satisfaction and domain well-being was not constant across domains, and domain motivation only partially mediated the relationship. This suggests that there are multiple mechanisms through which need satisfaction leads to positive outcomes. The fourth study in Article 2 tests goal self-concordance as another mechanism, focusing on goals set in important life domains. Goal self-concordance has previously been shown to be important for well-being through a process that includes goal persistence and attainment (Sheldon & Elliot, 1999). Article 2 (Study 4) tests the pathway from domain need satisfaction to well-being through goal self-concordance, goal effort, and goal progress.
Running head: WHERE DO SELF-CONCORDANT GOALS COME FROM?

Where Do Self-Concordant Goals Come From? The Role of Domain-Specific Psychological Need Satisfaction

Marina Milyavskaya
McGill University

Daniel Nadolny
University of Waterloo

Richard Koestner
McGill University
Abstract

Previous research has shown that self-concordant goals are more likely to be attained (Sheldon & Elliott, 1999), and can lead to an upward spiral of increased well-being (Sheldon & Houser-Marko, 2001). However, no research has investigated the factors which influence the adoption of self-concordant goals. The present research addresses this question by looking at the domains in which goals are set, and particularly at the amount of psychological need satisfaction experienced in these domains. Across five studies, including experimental, prospective, and daily diary methodologies, we demonstrate that domain-related need satisfaction predicts the extent to which people adopt self-concordant goals in a given domain, laying the foundation for successful goal pursuit. This is true both across participants in multiple domains, and on a within-person (between-domain) level. Additionally, we show that need satisfaction influences goal self-concordance because in need-satisfying domains people are both more likely to choose the most self-concordant goal (among a set of comparable choices), and are more likely to internalize the possible goals, rating them as more self-concordant. The implications of this research for the self-concordance model and the importance of examining goals within their broader motivational framework are discussed.

Keywords: self-determination theory, psychological needs, self-concordance, goal setting, goal pursuit
Where Do Self-Concordant Goals Come From? The Role of Domain-Specific Psychological Need Satisfaction

Every person has multiple important life goals that they pursue from day to day, often with varying degrees of success for each goal. While much research has focused on understanding general self-regulation and the goal pursuit process, the reasons why people meet with success in some goal domains while facing failure in others remain unexplored. We are not surprised to hear of politicians, scientists and movie stars who, while successful in their work, face failures in their personal lives; of students who meet their academic goals, while neglecting their physical fitness; or of people who have happy and fulfilling relationships, but never seem to move up the corporate ladder. Beyond the trade-offs in time and energy that people face on a day-to-day basis, the domain in which each goal is pursued may play an important role in goal pursuit, and the ultimate success or failure of our goals.

Although not frequently examined empirically, the question of what leads people to adopt some goals and not others has a long tradition in social psychological theory. Kurt Lewin discussed goal setting as a distinct set of processes from goal pursuit, proposing the variable of “potency” to explain which goals people use to guide their behaviour (Lewin, 1936). Kuhl also separated the processes related to “choice motivation”, or goal-setting, from the processes related to “control motivation”, or goal pursuit (Kuhl, 1984). Gollwitzer’s Rubicon model (1990) sets out a distinct phase in the motivational process, the predecisional action phase, where feasibility and desirability determine which
goals we choose to pursue. Ajzen’s theory of planned behaviour (1991) identifies three separate factors that lead to intentions: attitudes toward the behavior, subjective norms and perceived behavioral control. Fantasy realization theory posits that people transform fantasies about future behaviour into goals by contrasting their desired futures with present states (Oettingen, Pak, & Schnetter, 2001).

There are several common elements underlying all of these theories. Strength, valence, feasibility, and expectations are primary determinants in whether people choose to pursue a particular path. By understanding these characteristics, and the surrounding environmental context, it is possible to predict people’s intentions to pursue certain goals and behaviors. While these theories are useful in understanding the direction of the goals that people adopt, they omit predicting other critical characteristics of the goal. What will lead people to adopt long-range or short-range goals? What processes cause people to create specific goals instead of nebulous, flexible goals? When do people choose goals that are reflective of their true selves? Learning the answers to these questions is important if we are to have a more complete understanding of the motivational process, and the factors that lead to successful goal pursuit. The work in this paper complements existing theories related to goal setting. Instead of examining valence and expectancies in predicting the goals that people adopt, we seek to understand the psychological processes that influence whether people adopt goals which reflect their true selves (termed ‘self-concordant’; Sheldon & Elliot, 1999).
Previous research has shown that self-concordance, defined as the extent to which our goals are in accordance with our core self, affects how we pursue these goals and whether we ultimately succeed at them (Sheldon & Elliot, 1999). An important aspect of the goal-setting process, however, remains unknown: Why are some goals we set more self-concordant than others? The present research will explore the under-examined impact of domains (the broad frameworks that people use to categorize their goals) on goal setting and goal pursuit through the lens of self-determination theory (SDT; Deci & Ryan, 2000; 2008), and extend the self-concordance model by examining the antecedent processes that lead to the adoption of self-concordant goals.

Most research on goal pursuit either focuses on only one goal or uses aggregated scores of multiple goals to draw conclusions about the person’s overall goal system. Such aggregation overlooks the fact that goals are not set in a vacuum, but emerge within the context of important life domains, which represent “distinct spheres of human activity” (Emmons, 1995). Based on SDT, we propose that the domain in which a goal is situated, and particularly the extent to which the three basic psychological needs for autonomy, competence, and relatedness are satisfied (Deci & Ryan, 2000; heretofore referred to as ‘need satisfaction’) in that domain, plays a role in whether the goal is more or less self-concordant. The present research thus extends the self-concordance model of goal pursuit by examining previously unexplored processes that are antecedent to self-concordance, while simultaneously demonstrating the importance of examining
the underlying motivational environment (such as domains) in which goals are situated.

**Self-Concordant Goals and Goal Pursuit**

Specific predictions regarding the outcomes of self-concordant motivation have been outlined by previous research. Grounded in SDT, this research examines the extent to which goals and strivings are pursued for autonomous versus controlled reasons and “express enduring interests and values” (Sheldon & Elliot, 1999). Autonomous reasons include pursuing a goal because of interest or enjoyment (*intrinsic*), because of the inherent importance of the goal (*identified*), and because the goal reflects one’s values (*integrated*). On the other hand, controlled reasons for pursuing a goal include doing so because of shame, guilt, or other internal pressure such as contingent self-worth (*introjection*), and *external motivation*, which occurs when a goal is pursued because someone else wants it or because there are concrete gains or losses (e.g., money or grades) associated with the outcome. Self-concordance is calculated by summing the scores indicating endorsement for the autonomous reasons and subtracting the scores of the controlled reasons, or by averaging the autonomous reasons with the reverse scores of the controlled reasons. In other words, the more a goal is pursued for autonomous reasons and the less it is pursued for controlled reasons, the more self-concordant the goal.

Although the term ‘self-concordance’ has been solely used to refer to people’s motivation for their goals, the construct closely parallels the relative autonomy continuum proposed by SDT to describe people’s self-regulation for
various activities (Ryan & Deci, 2008). Relative autonomy is thus essentially the same construct as self-concordance, as autonomous motivation or self-regulation is usually assessed by examining intrinsic, identified, introjected and external reasons for doing an activity and combining them into an index. However, since the term self-concordance has in the past been used to refer to goals, we will use this term throughout the present paper.

Goal self-concordance has been shown to influence well-being through a process that includes goal persistence and attainment. Research has demonstrated that more self-concordant motivation leads to greater long-term effort devoted to achieving the goal (Sheldon & Elliot, 1999), resulting in greater likelihood of success. Goal attainment then leads to increases in feeling of autonomy, competence and relatedness, particularly when the goal is self-concordant (Sheldon & Elliott, 1999). Finally, need satisfaction leads to increased well-being. Parts of this model as well as the model as a whole have been extensively tested, and shown to work even after taking into account goal-related self-efficacy, goal importance, implementation intentions, behaviour competencies, and whether the goal was approach or avoidance-oriented (e.g., Koestner, Lekes, Powers, & Chicoine, 2002; Sheldon & Elliott, 1999).

Prior research has examined the role of personality variables, showing that traits including self-esteem, self-efficacy, locus of control, emotional stability, and proactive personality are positively related with the extent to which people set self-concordant goals (Elliott & Sheldon, 1998; Greguras & Diefendorff, 2010; Judge, Bono, Erez, & Locke, 2005). Because individuals who have positive core
self-evaluations think of themselves as competent and capable, they are thought to be less amenable to external influence, and therefore more likely to pursue goals for internal reasons (Judge et al., 2005). However, it is likely that even those individuals with generally positive self-regard sometimes set and pursue goals which are controlled rather than autonomous, whereas someone with a generally negative view of self can nevertheless pursue some goals for autonomous reasons. Examining the underlying factors which determine the nature of a specific goal, such as the circumstances or characteristics of the domain in which the goal is set, rather than the broad aggregate of all goals set by a person, can shed light on the reasons why some of the goals we set are more self-concordant than others. For example it may be that even a person who typically has high self-esteem may lack confidence when it comes to her job and so set less autonomous goals at work, instead following goals which are set for her by her superiors but which she does not personally endorse. Conversely, that same person may feel very competent and close with her family, which allows her to set more autonomous goals for herself in that domain. Focusing on these goals separately rather than aggregating across all of a person’s goals would further our understanding of the important characteristics of goals which influence self-regulation and goal success.

Although goals can exist at multiple levels of abstraction, most research on goal pursuit focuses on personal goals which people can articulate and consciously pursue in their day-to-day lives (Emmons, 1999). This approach assumes that such personal goals are contextual and are linked to broader plans or projects that people hope to accomplish in important areas of their lives. Taken
together, this suggests that the context, or domain, in which a goal is generated may shape the nature of the goal and consequently affect goal pursuit. Specifically, we expect that individuals set more self-concordant goals in domains in which they experience greater satisfaction of the psychological needs for autonomy, competence and relatedness.

The Role of Psychological Need Satisfaction

Self-determination theory conceptualizes psychological needs not as individual differences but as essential nutrients that are required for optimal psychological growth and well-being (Sheldon, 2011). Unlike other theories which are interested in whether different individuals are more likely to pursue some needs rather than others (e.g., need for achievement; McClelland, 1985) SDT focuses on individual differences in the degree to which each of the three basic needs of autonomy, competence and relatedness are satisfied in each individual. These three needs are thought to be universal across people and cultures and applicable throughout all aspects of a person’s life. Autonomy encompasses experiencing choice and volition in one’s behaviour and endorsing one’s activities and actions in a personally authentic manner. Competence refers to feelings of effectiveness and mastery over one’s environment and the ability to bring about desired outcomes. Finally, relatedness involves feeling close and connected to other people in one’s everyday interactions. Although a great deal of research has examined the three needs separately, it is theorized that all three needs are essential and that missing any one of these needs result in sub-optimal outcomes (Deci & Ryan, 2000). This is akin to there being only one way of being
Previous research has shown that psychological need satisfaction experienced in a given environment or domain influences people’s motivation for pursuing further activities in that domain (Deci & Ryan, 2008). Although this link has been shown to occur in multiple life domains, including school (e.g., Sheldon & Krieger, 2007), health (Hagger, Chatzisarantis, & Harris, 2006), family (Milyavskaya & Koestner, 2011), and relationships (Patrick, Knee, Canevello, & Lonsbary, 2007), it has only been applied to motivation for engaging in the domains per-se, and has not yet been applied to goals set in those domains. Goal setting and goal monitoring are thought to be essential requirements for effective self-regulation (Baumeister & Heatherton, 1996), which, in turn, is thought to be the key to adaptive, healthy functioning (Baumeister & Tierney, 2011). Given the large body of research demonstrating the unique and important role played by personal goals (e.g., Bandura, 1991; Dweck, 1991, Freund & Riediger, 2006), it is particularly important to examine motivation for goals rather than motivation for a specific behaviour or activity as has been done in the previous SDT research on need satisfaction and motivation. Indeed, motivation or an activity and for a goal set in the same domain may be very different. For example, someone may play tennis because she enjoys it (autonomous motivation for an activity), but set for herself the goal of improving her serve because her coach tells her she needs to do it to win an upcoming competition (controlled motivation for goal).
Since domains that provide support for the basic psychological needs allow individuals to express their authentic self, individuals experiencing need satisfaction in a given domain should be able to set goals in that domain which are in line with their true self (i.e., are more self-concordant). Additionally, although an individual may have a specific set of more or less self-concordant reasons for setting a given goal, the motivation for pursuing that goal may also vary. For example, a student whose goal to do well in school originated from her parents may, in the course of pursuing this goal, internalize the goal and feel that it more closely matches her own desires and core self. Given that need satisfaction is thought to facilitate the integrative process (Ryan, 1995), we expected that goals set in a domain where one experiences the satisfaction of psychological needs would be better integrated (i.e., more self-concordant) than those set in domains in which the needs are not satisfied.

**Multiple Domains**

Within SDT, it has been proposed that contextual effects are a crucial component needed to understand motivational processes. For example, Vallerand’s (1997) model of hierarchical motivation proposes that motivation can exist at the global, contextual, and situation level, and points to the importance of focusing on each of these levels and their interplay. The majority of research in SDT has indeed focused on people’s motivation for engaging in specific domains (as well as its antecedents and consequences), including school, sports, health, work, and relationship domains, among others (for a review of motivational research in these domains, see Deci & Ryan, 2008). Additionally, some research
has examined multiple domains simultaneously, showing similar effects of
motivation on outcomes in these domains including adjustment and well-being
(e.g., Milyavskaya & Koestner, 2011; Soenens & Vansteenkiste, 2005). Although
such domain specificity has been applied to research on motivation for engaging
in a specific activity or in a given domain, this has not been the case for research
on goals.

Although the goals and the domain in which they are set are important for
goal pursuit, most studies which examine the progression of goal pursuit ask
participants to set multiple goals and then aggregate these goals to compute mean
scores on the variables of interest (e.g., Sheldon & Elliot, 1999; Emmons, 1986).
This approach allows researchers to link goal-related and personality variables,
and has generated a wealth of knowledge on the various aspects of goal pursuit;
however, it overlooks potential differences based on the goals themselves.
Though some studies do examine goal pursuit in a given domain such as
academics (Koestner, Otis, Powers, Pelletier, & Gagnon, 2008), health (Koestner
et al, 2008), or sport (Smith, Ntoumanis, Duda, 2007), to our knowledge only one
other study has examined differences in goals arising from the domain level
(Sheldon & Elliot, 2000). In that study, the authors examined goal pursuit
associated with different social roles, showing that while most goal progress led
to similarly positive outcomes, people reported different levels of self-concordant
motivation for different roles (Sheldon & Elliot, 2000). In particular, they found
that friendship and romance- related goals were more intrinsically motivated, and
that student and employment goals were experienced as more controlled (either
externally or through introjects). Since goal motivation can vary among domains, and previous research has shown that people typically report different levels of need satisfaction in different life domains (with most need satisfaction reported with friends and in relationships and the least at school and work; Milyavskaya et al., 2010; Milyavskaya & Koestner, 2011), we expect that differences in need satisfaction could be responsible for these differences in goal self-concordance.

**Goal Setting and Goal Integration**

Although we expect that people will report pursuing more self-concordant goals in need-satisfying domains, this can happen for two different reasons. First, people may actually select ‘better’ goals in these domains – goals which are more in line with the self. This explanation fits with the original self-concordance model hypothesis that people’s deliberations over which goals to choose may be flawed, in that people sometimes choose to pursue goals that are not reflective of their underlying values and interests (Sheldon & Elliot, 1999). In a domain where basic needs are satisfied the organismic valuing process described by Carl Rogers (1951) is likely to function effectively and individuals are likely to pursue goals that reflect their true self. Alternatively, a person may more clearly see the personal relevance, interest and value of any goals set in a need-satisfying domain (thereby viewing these goals as more self-concordant), such that a goal that is set in a need-satisfying domain is perceived as more personally relevant, interesting, or valuable than the same goal that is set in a non-need satisfying domain. Past research has shown that personalization of goals results in higher levels of intrinsic motivation and better performance (Cordova & Lepper, 1996). Either or
both of these two processes could explain our hypothesized effects; this will be investigated in Studies 2 and 5.

**Present Studies**

In the present studies, we examine whether people set more self-concordant goals in domains where they experience psychological need satisfaction (vs. non-satisfying domains), and expand Sheldon and Elliot’s (1999) self-concordance model by adding domain need satisfaction as an antecedent of goal self-concordance. We consider domains as spheres of activity (e.g., family, work, academic domain, etc.). Although we refer to domains as ‘need satisfying’ (or ‘non-satisfying’), we do not necessarily mean that the domain itself satisfies the needs, but simply that the person perceives that their needs are satisfied (or not satisfied) in that domain.

In Studies 1 and 2, we experimentally test whether people set more self-concordant goals in need-satisfying domains. The second study also examines the effects of day-to-day variations in need satisfaction on daily goal self-concordance, testing the possibility that increased need satisfaction plays a role in how goals are internalized. In Studies 3 and 4, we test the expanded model of self-concordance and its applicability across multiple important life domains. Finally, in Study 5, we test two possible explanations for our findings, namely that people are more likely in general to internalize goals in a need-satisfying domain and that people are more likely to select a self-concordant goal that best fits with their interests and their values. Throughout the studies, we examine combined need satisfaction (rather than the role of each need separately) since all three needs are
considered essential and have been shown to play similar roles (e.g., Patrick et al., 2007) and in many cases are “largely redundant” (Greguras & Diefendorff, 2010).

**Study 1**

In this study, participants were asked to think about two domains, one in which their psychological needs were satisfied and another in which they were not, and report their need satisfaction in each domain. Participants were then asked to imagine setting a new goal in each of these domains, one that they had not previously pursued, and rated the reasons why they would pursue each goal. We hypothesised that goals set in need-satisfying domains would be more self-concordant than goals set in less need-satisfying domains.

**Method**

**Participants and procedure.** Participants were 50 American adults (60% female) recruited through Amazon Mechanical Turk for a brief, 10-minute study on goals and life domains. They were 18 to 64 years old ($M = 36.2$ years, $SD = 13.35$). Participants were asked to name two domains or activities which were important to them. One was described as meeting the three needs (“Please think of a domain or activity which is important to you, and in which you are free to make decisions and to do the things you want, and where you feel competent and connected to others.”), while the other one was less need-satisfying (“Please think of a domain or activity which is important to you, but which makes you feel pressured or constrained, less competent than you would like to be, and not particularly connected to others.”). The order in which these domains were elicited was randomized. Participants then rated their need satisfaction in each of
these domains, and were asked to imagine themselves setting a goal in that
domain which they were not already pursuing. Finally, they were asked to rate
their reasons for pursuing each of these goals.

Measures.

Domain need satisfaction. Participants rated each domain on a six-item
measure of need satisfaction initially developed for use with memories (Philippe,
Koestner, Beaulieu-Pelletier, & Lecours, 2011) and adapted here to assess
domains. Sample items include “In this domain I feel free to do things and think
how I want” (autonomy), “In this domain I feel competent or capable”
(competence), and “In this domain I feel connected to people” (relatedness). One
item assessing autonomy was negatively worded (“In this domain I feel obliged to
do things or think in certain ways”) and reverse-coded. A mean score of overall
need satisfaction was obtained for each domain ($\alpha = .75$ for the need-satisfying
domain; $\alpha = .68$ for the non-satisfying domain). All responses were made on a 7-
point scale of -3 (Strongly disagree) to 3 (Strongly agree).

Goal self-concordance. Participants were asked to rate their motivation
for pursuing that goal using four items which assessed external (“Because
somebody else wants you to, or because you’ll get something from somebody if
you do”), introjected (“Because you would feel ashamed, guilty, or anxious if you
didn’t – you feel that you ought to strive for this”), identified (“Because you
really believe that it is an important goal to have – you endorse it freely and value
it wholeheartedly”), and intrinsic (“Because of the fun and enjoyment which the
goal will provide you – the primary reason is simply your interest in the
experience itself”) reasons for goal pursuit (Koestner et al., 2002). All responses were made on a 7-point scale of -3 (Strongly disagree) to 3 (Strongly agree). We computed a general measure of self-concordance for each goal by adding the intrinsic and identified (autonomous) scores and subtracting the external and introjected (controlled) scores.

**Results**

We first wanted to verify that domains generated from the ‘need-satisfying’ description were indeed rated higher on need satisfaction than non-need-satisfying domains. As expected, participants reported higher need satisfaction in need-satisfying ($M = 5.84, SD = .91$) rather than non-satisfying ($M = 3.53, SD = 1.04$) domains, $t(48) = 13.16, p < .001$. We then tested our main hypothesis, that people set more self-concordant goals in need-satisfying domains. Results showed that participants did report more self-concordant reasons for pursuing goals set in a need-satisfying domain ($M = 5.80, SD = 4.87$) than goals set in a non-need-satisfying domain ($M = 2.29, SD = 5.26$), $t(47) = 4.12, p < .001$.

Finally, we were interested in whether the amount of need satisfaction reported in each domain could predict the self-concordance of the goal set in that domain. Regression analyses showed that this was the case both in the need-satisfying domain ($\beta = .35, R^2 = .13, F(1, 47) = 6.73, p < .05$) and in the non-satisfying domain ($\beta = .39, R^2 = .15, F(1, 47) = 8.26, p < .01$). Results of all analyses held when controlling for gender.
Brief Discussion

In this first study, we showed that the goals set in need-satisfying domains are more self-concordant than those set in domains in which the basic psychological needs are unsatisfied. Furthermore, we found that in both domains, the amount of need satisfaction reported in the domain predicted the extent to which the goal was pursued for self-concordant reasons. It is important to note that the similarity in the measure of domain need satisfaction and goal self-concordance is occurring at different levels, and is not measuring the same construct. For example, we can imagine Harry, who values the domain of sports, and feels a high degree of autonomy, competence and relatedness while engaged in this domain. Even in this need-satisfying domain, it seems plausible that he could adopt the goal to win a particular game in order to live up to the memory of his parents, or feel that he needs to win to not let down his friends. Conversely, Mat, who feels very incompetent in the domain of close relationships, may adopt a goal to dance with his romantic interest, while endorsing intrinsic reasons for doing so. Although need satisfaction and self-concordance were assessed in the same session, it is unlikely that goal self-concordance could have influenced reports of need satisfaction because participants were asked to generate goals which they have not previously pursued. This study thus provides initial evidence that need satisfaction is an antecedent of goal self-concordance.

Study 2

We designed a second study to replicate Study 1 with goals that were actually pursued rather than imagined, while allowing us to examine whether
changes in need satisfaction also affect self-concordance. Consequently, Study 2 was a week-long daily diary study in which participants were asked to generate and pursue a novel goal in either a need-satisfying or a non-need-satisfying domain. This allowed us to conduct within-person analyses looking at how people’s motivation for their goals change across time. Additionally, we were interested in beginning to test the expanded self-concordance model, examining whether goals set in need-satisfying domains would be more likely to be achieved because they were more self-concordant. We hypothesized that: (a) participants asked to generate a goal in a need-satisfying domain (need-satisfying condition) would set more self-concordant goals than those who generated a goal in a domain characterized by a lack of psychological need satisfaction (non-satisfying condition); (b) day-to-day changes in need satisfaction would predict daily feelings of goal self-concordance; (c) participants in the need-satisfying condition would be more likely to achieve their goal at the end of the week, and this relationship would be mediated by self-concordance.

Method

**Participants and procedure.** One hundred and sixty-nine participants (86% female) ages 18-48 ($M = 21.15, SD = 4.37$) were recruited through online advertisements on the university classified website as well as through the extra-credit subject pool at a large Canadian university. All participants were sent the initial survey on a Sunday morning. In this survey, participants were asked to name either a need-satisfying or non-satisfying domain using the same description as in Study 1, and completed measures of domain need satisfaction. Participants
were then asked to think of a new goal in that domain which they would like to accomplish in the next week (and not a goal which they were already pursuing), and rated various features of this goal including goal self-concordance. Examples of reported goals included “attend the gym twice this week”, “write three excellent essays” and “learn a finger picking song on guitar”. Every day for the seven following days, participants were sent a brief electronic survey at 6pm which they were asked to complete by the end of that evening. Each brief survey assessed domain need satisfaction and goal self-concordance experienced during that day. On the final day of the study, participants were also asked whether they felt like they had achieved their goal. One hundred and thirty nine participants (82%) completed the final survey.

**Measures.**

**Time 1 Domain need satisfaction.** The 18-item measure of need satisfaction used by Sheldon and Gunz (2009) was adapted for measuring need satisfaction in specific life domains. Items assessed autonomy (e.g., ‘In this domain I am free to do things my own way’), competence (e.g., “In this domain I often struggle doing something I should be good at”; reversed), and relatedness (e.g., “In this domain I feel close and connected with other people”). Nine of the 18 items were negatively worded. Responses were made on a 7-point scale, ranging from -3 (*Strongly disagree*) to 3 (*Strongly agree*). As we were interested in assessing overall domain need satisfaction, we combined all the items to form a measure of overall need satisfaction in the domain. This scale had a good reliability, α = .88.
Goal features. Goal self-concordance was assessed using the same four items as in Study 1. Additionally, participants rated the importance of the goal (“How important is this goal to you?”), their commitment to the goal (“How committed do you feel toward this goal?”), and the difficulty of the goal (“How challenging do you think it will be to attain this goal?”). Each of these one-item measures was rated on a scale of 1 (Not at all) to 7 (Extremely).

Daily domain need satisfaction. On each follow-up, domain need satisfaction was assessed using one item for each need: “Today I felt competent or capable in this domain” (competence); “Today I felt close and connected to other people” (relatedness); “Today I felt free to do things and think how I want” (autonomy). This was rated using a sliding scale with values ranging from 0 to 100. Mean need satisfaction was computed for each day by taking the mean of the three items. This 3-item measure was reliable, with alphas ranging from .75 to .87.

Daily self-concordance. Each day, participants were asked to rate their motivation for pursuing that goal on that day using the same four items as at the initial assessment.

Goal Achievement. On the final day, participants were asked to provide a dichotomous yes/no answer to the following question: “Overall I feel like I have achieved this goal.”

Results

We first tested the differences between conditions on initial measures of need satisfaction and goal self-concordance. As expected, participants in the need-
satisfying domain condition reported greater need satisfaction ($M = 5.00, SD = .91$) than those in the non-satisfying domain condition ($M = 3.75, SD = .64$), $F(1, 168) = 108.24, p < .001$. Additionally, goal self-concordance was also higher for those who set a goal in a need-satisfying ($M = 2.43, SD = 5.31$) rather than non-satisfying ($M = -0.86, SD = 4.89$) domain, $F(1, 168) = 17.63, p < .001$. There were no differences between conditions on ratings of importance of the goal, commitment to the goal, or goal difficulty (see Table 1). These results held true when controlling for gender.²

To provide a dynamic test of the influence of need satisfaction on motivation, we conducted analyses on the daily reports of motivation. Since need satisfaction was rated on a scale of 0-100, we scaled scores on this variable by dividing them by 10 to make them more similar to scores on other variables in the analyses. Using multilevel analyses with days nested within individuals, we tested whether self-concordance on a given day could be predicted by a change in need satisfaction from the prior day. Specifically, we predicted that on days on which domain need satisfaction increased participants would endorse the domain-specific goal they were pursuing for more self-concordant reasons, controlling for prior motivation. We included condition and gender as level-2 predictors of daily motivation. The difference score of need satisfaction, the prior day’s score of need satisfaction (to control for baseline), and the prior day’s score of self-concordance were included as predictors at level-1, with measures specified as repeated across days with a first-order autoregressive covariance structure. Both the prior day self-concordance and the change in need satisfaction were significant predictors, $b$
\[ b = .92 (SE = .02, t(315.65) = 54.32), \] and \[ b = .21 (SE = .05, t(707.97) = 4.20), \]
respectively, both \( p < .01 \). Thus, increased need satisfaction on a given day was
associated with feeling greater self-concordance about the goal on that day.
Neither gender, condition, nor the previous day’s levels of need satisfaction were
significant predictors of daily fluctuations in motivation. Follow-up analyses
showed that there were no interactions with either gender or condition, meaning
that the predictors had the same effects on self-concordance for both males and
females and across both conditions.

Finally, we examined the effects of condition and self-concordance on
goal achievement at the end of the week. We expected that participants who set
their goal in a need-satisfying domain (need-satisfying condition) would be more
likely to achieve their goal than those in the non-need-satisfying domain
condition, and that this would be mediated by goal self-concordance. For all
analyses goal achievement was coded as 1 = achieved the goal and 0 = did not
achieve goal, and condition was coded as 1 = need-satisfying domain and
0 = non-need-satisfying domain. We used the method outlined by Preacher and
Hayes (2008) to test this mediation model, controlling for gender as a covariate.
Using the Preacher and Hayes (2008) macro for SPSS which allows for estimation
of mediation with a binary outcome variable, we estimated 95% confidence
intervals of the indirect effect using bootstrapping re-sampling \((k = 5000)\)
procedures.

Of the 139 participants who completed the final day questionnaire, 73
(52.5\%) reported that they achieved their goal: 61.2\% (41 of 67) in the need-
satisfying condition and 44.4% (32 of 73) in the non-satisfying condition (Pearson $\chi^2 = 3.90, p < .05$). Results from the mediation analyses first showed that condition was a significant predictor of self-concordance, $b = 3.74 (SE = .84, p < .01)$, and that self-concordance was a significant predictor of goal achievement, $b = .08 (SE = .037, p < .05)$. There was also a significant direct effect of condition on goal achievement $b = .74 (SE = .35, p < .05)$. This direct effect was reduced to $b = .48 (SE = .38, p = .21)$ in the mediation analysis, suggesting full mediation.

The indirect effect of condition on goal achievement through goal self-concordance was .28 ($SE = .16$), and the bootstrapped 95% CI estimates did not include zero (.03 to .67).

**Brief Discussion**

In this study, we again showed that people set more self-concordant goals in domains in which they experience need satisfaction. This influence of need satisfaction was restricted to self-concordance, as goal importance, commitment, and difficulty did not differ between conditions. Additionally, we showed that day-to-day changes in need satisfaction result in day-to-day changes in self-concordance, although the goal itself remained the same. This suggests that people are better able to internalize goals when they experience need satisfaction in the domain in which the goal is set. This was the case across both conditions. Participants were thus able to select more self-concordant goals in a need-satisfying domain, and also to better internalize their goals on days when they experienced increased need satisfaction throughout the week. Although the internalization of goals is typically examined over a longer time course, our
findings suggest that similar effects may be occurring, to some extent, even on a
day-to-day basis. For example, a goal of working on writing a course paper can
feel personally important and even interesting on days when a student experiences
autonomy, competence and relatedness in his school environment, but less so
after a long day of sitting in a classroom where he is made to feel controlled,
incompetent, or disconnected. On these days, it is likely that this student views the
goal as controlled, and if he works on the paper at all it would be because he feels
like he has to, or that he is pressured by an upcoming deadline.

Finally, we showed that goals set in need-satisfying domains are more
likely to be achieved, and that this effect is mediated by self-concordance.
Participants in the need-satisfying condition were more likely to achieve their
goals, providing evidence of yet another benefit of psychological need
satisfaction. This was fully mediated by self-concordance, so that participants in
the need-satisfying condition were more likely to achieve their goal because the
goal was more self-concordant.

**Study 3**

Although people do sometimes set very short-term goals, most goals that
people pursue unfold over a longer time frame than one week. The third study
was conducted to test the role of psychological need satisfaction in self-
concordance and goal pursuit in goals pursued over a longer period of time – in
this case, a semester. In this study, participants set goals in four domains
(academic, health, friendship, and relationship) and completed three follow-up
questionnaires over the course of the semester. We were interested in testing all
the aspects of the extended goal self-concordance model – namely, that domain need satisfaction predicts goal self-concordance, that self-concordance predicts progress, and that progress predicts domain need satisfaction at the end of the semester.

Additionally, we were interested in examining other characteristics of the domains in which the goals were set, namely the subjective importance of the domain, and the time participants spent in that domain. Both of these variables could influence the importance or commitment to the relevant goal, thereby affecting both self-concordance and goal progress. Furthermore, the time spent on activities in a domain could be a reflection of the time available to spend on pursuing the goal, which could directly impact goal progress. Including these variables in the analyses would demonstrate the specificity of the effects of domain need satisfaction on goal self-concordance. In addition, this allowed us to test for interactions – whether need satisfaction played a stronger role in some domains than in others.

Finally, we were interested in testing whether these findings would hold on a within-person (between-domain) level. Prior research has shown that certain personality variables, such as positive self-concept (Judge et al., 2005) are related to more self-concordant goals, and could also influence perceptions or experiences of need satisfaction. Although it is impractical or even impossible to attempt to control for all possible person-level variables, another strategy to rule them out is to examine within-person effects across multiple domains. If a given individual sets a more self-concordant goal in a domain where he or she
experiences greater need satisfaction than in a domain where his or her needs are less satisfied, this would suggest that it is really due to the effects of the domain and not to a characteristic of the person.

This study thus tested three main sets of hypotheses. First, we expected that within each domain need satisfaction will predict self-concordance of the goal set in the domain, which will in turn predict goal progress; goal progress will then predict changes in need satisfaction at the end of the semester. Secondly, we hypothesized that these effects will hold even when controlling for domain importance and time spent in the domain. Third, we expected that the effects proposed under the first hypothesis will also be seen using within-person analyses. In addition, we were interested in looking at the proportion of the variance in our key variables that was explained across domains (within-person level) compared to across participants (between-person level).

Method

**Participants and procedure.** Participants were 62 heterosexual couples (124 participants) 18-37 years old (\(M = 21.52, \ SD = 3.51\)). Participants were recruited through advertisements posted online and around Montreal university campuses for a study on “social support and goal progress in romantic relationships”, which was a large study including many variables which were not relevant to the present study. The study consisted of an initial lab session and three online follow-ups. At the initial session, participants came into the lab in pairs and each filled out an hour-long survey where they reported their need satisfaction in four domains and were asked to set a goal they intended to pursue.
in each of these domains. For each goal, they completed a measure of goal self-concordance. At each follow-up, they were reminded of their goals and rated their goal progress. Participants were each paid $40. One hundred and sixteen participants completed the entire study, and only three participants did not respond to any of the follow-ups.

**Measures.**

**Domain Need Satisfaction.** Need satisfaction was assessed at the initial testing period and at the final follow-up using a 15-item scale adapted from a longer scale previously used to measure domain need satisfaction (Milyavskaya & Koestner, 2011), which was completed referring to each of four domains. Participants were given the following instructions: “In the following questions, you are asked to rate various experiences in the following life domains: school; health (including your physical, emotional and mental health); in your relationship; with friends. For each question, respond how true the statement is for you in each of the 4 domains.” Each item was followed by the four domains, and participants rated how true the statement was for them in each of the domains on a scale of 1 (*not at all true*) to 7 (*very true*). Sample items include “There is not much opportunity for me to decide for myself how to do things in this domain” (autonomy, reversed); “I feel very capable and effective in this domain” (competence); “In this domain, I feel cared about by other people” (relatedness). As we were interested in overall domain need satisfaction (and not in each need separately), we computed a mean of all 15 items (after reversing the negatively-
worded ones) for each domain. All reliabilities were high, α’s ranged from .85 to .93.

**Domain time and importance.** For each domain, participants rated, at time 1, how important that domain was to them ranging from 1 (*not at all important*) to 7 (*completely important*). They also rated how much time they spent in that domain from 1 (*less than 5 hours*) to 7 (*more than 30 hours*), with each number in between representing a 5-hour increment.

**Goal descriptions.** Participants were asked to indicate four goals they were trying to pursue during the semester, one in each of the academic, health, relationship, and friendship domains. Examples of goals were “get a 3.7 GPA” (for academic goal); “eat a more balanced diet” (for health goal); “be more patient and caring with partner”, “open up about my feelings” (for relationship goal); and “stay close with friends back home”, “spend more time with them” (for friendship goal).

**Goal self-concordance.** This was assessed in the same way as in study 1. In order to keep the measures consistent with the other variables in the study and to facilitate the interpretation of the analyses, we took a mean of the four items with the controlled items reversed (instead of subtracting the controlled motives from the autonomous motives).

**Goal progress.** Goal progress for each goal was assessed at each of the four follow-ups using three items: “I have made a lot of progress toward my goal”, “I feel like I am on track with my goal plan”, and “I feel like I have achieved my goal”. Ratings were made on a seven-point Likert scale, from 1
(strongly disagree) to 7 (strongly agree). This measure of goal progress has been used in previous studies (Koestner et al., 2002; Sheldon & Kasser, 1998). The three-item scale was reliable, alphas ranging from .82 to .92 across the four goals and the three follow-ups. A summary of self-reported goal progress for each goal was calculated by taking the mean of the three follow-up reports for that goal.

**Results**

**Preliminary results.**

Table 2 shows the means, standard deviations, and intercorrelations of the study variables within each domain. Need satisfaction was lowest in the school domain, and highest in the relationship domain. Participants spent the most time in the school and relationship domains, and less time in the health and friends domains. The goal set in the school domain was the least self-concordant, and participants reported the least progress on their health goal. There were no main or interactive effects of gender on any major study variables, so it will not be discussed further.

As we were interested in the within-person relationship between the different domains, we computed the proportion of the variance in need satisfaction, self-concordance, and goal progress explained at the within-person level. Using HLM software, we ran three 3-level unconditional models (one for each dependent variable) where domains were nested within individuals who were in turn nested within couples, with no predictor variables specified at any level. Testing such a model allows us to look at the proportion of the variance in the outcome which is explained at each level (Raudenbush & Bryk, 2002). Results
showed that 79% of the variance in need satisfaction, 72% in self-concordance, and 83% in goal progress was within person (between domains). The rest of the variance was between person (21%, 20%, and 6% for need satisfaction, self-concordance and goal progress respectively) and between couples (0%, 9%, and 11% for each of the variables respectively).

**Predicting self-concordance, goal progress, and final need satisfaction in each domain.**

As participants were nested within couples, we used multilevel modeling analyses to account for non-independence of the data. However, we did not expect any couple effects to influence our dependent variables, and were only interested in the individual-level (level-one) effects.

We first tested whether need satisfaction in each domain predicted self-concordance of the goal set in that domain. We also included the time spent in the domain, and the importance of the domain. Table 3 shows the results of these analyses. In each of the domains, need satisfaction significantly predicted self-concordance. Domain importance and time spent in the domain did not predict self-concordance, except in the friendship domain, where more time spent with friends was negatively related to goal self-concordance. In another set of analyses, we added the interaction terms of need satisfaction with importance, need satisfaction with time, importance with time, and the three-way interaction. In all four domains, need satisfaction remained a significant predictor of self-concordance, all $ps < .05$. Importantly, none of the interaction terms in any of the domains were significant, all $ps > .10$. 
Next, we tested the established part of the self-concordance model in four domains, namely the paths between self-concordance to goal progress and goal progress to final need satisfaction. First, we found that self-concordance significantly predicted goal progress in all domains (see Table 3 for all results). Results also showed that domain importance and the time spent in the domain predicted goal progress, although the results were somewhat mixed across domains. Finally, we tested the effect of goal progress on domain need satisfaction at time 4. Results showed that in each of the domains goal progress predicted greater need satisfaction in the domain even after controlling for initial need satisfaction.

**Predicting self-concordance, goal progress, and final need satisfaction within-person.**

To test our third hypothesis, that the effects will hold within-person, we used HLM to conduct 3-level analyses where domains were nested within a person, who was nested within each couple. As we were not interested in predicting person-level or couple-level effects, we did not include any predictors at these levels and will not consider them further. In each of the following analyses, all the predictor variables were centered within-person (group-mean centered) to look at the effects of a person’s domain compared to their other domains. Table 4 shows the result of the three analyses on self-concordance, goal progress, and need satisfaction at the final follow-up. As expected, domain need satisfaction predicted self-concordance \((b = .25, p < .01)\), which in turn predicted
goal progress \( (b = .22, p < .01) \). Finally, goal progress predicted final domain need satisfaction controlling for initial need satisfaction \( (b = .15, p < .01) \).

**Brief Discussion**

The present study provided a first test of the extended self-concordance model, showing that psychological need satisfaction in academic, health, friendship and relationship domains predicted the self-concordance of the goals set in those domains, ultimately leading to greater goal progress and increases in need satisfaction. Those who experienced autonomy, competence and relatedness in a domain were more likely to set self-concordant goals, thus beginning a cycle that led to greater goal progress and an increase in need satisfaction in that domain at the end of the semester. We also showed that this was not attributable to person-level variables, as the effects held in a within-person analysis across domains. These within-person analyses demonstrate that a person who experiences greater need satisfaction in a specific domain than in other domains is more likely to set self-concordant goals and make significant progress compared to goals in other less need satisfying domains. For example, if John experiences more need satisfaction in the academic domain than in the relationship domain, he will set and achieve more self-concordant academic goals and will set less self-concordant relationship goals, with these latter goals more likely to be met with failure than academic goals.

Furthermore, the importance of the domain and the time spent in the domain, while playing a role in goal pursuit, neither accounted for nor moderated
the effects of need satisfaction on self-concordance. This means that need satisfaction influenced self-concordance to the same extent in important and unimportant domains, and in domains in which a person spent more or less time, supporting the assertion that all people should be similarly affected by basic need satisfaction (Sheldon, Cheng, & Hilpert, 2011). However, either the importance of the domain or the time spent engaging in it predicted additional variance in goal progress in each domain, over and above that predicted by self-concordance. This suggests that although having self-concordant goals is important for goal progress, other domain-specific variables can also play a role in goal pursuit. This finding emphasizes the necessity of looking at the context in which goals are set.

**Study 4**

Although in Study 3 we tested all the steps of the extended self-concordance model, we were unable to statistically test the full model due to the limited number of participants. We therefore conducted a fourth study to provide a test of the entire model. In this study, participants set goals in three domains (academic, health, and leisure) and were followed-up three times throughout the semester. Additionally, for each participant we obtained a friend’s ratings of the extent to which the participant was setting these goals for self-concordant reasons. To our knowledge, no other studies have used a non-self-report measure of goal self-concordance. Although motivation is usually considered personal, it is possible that close friends may understand a person’s reasons for their actions in a different way than that person themselves sees it. We hypothesized that (a) in
each of the three domains, need satisfaction would be a significant predictor of
goal self-concordance, both as rated by the individual and by their friend, and that
(b) need satisfaction would fit into the overall model of goal striving as an
antecedent of goal self-concordance.

Method

Participants and procedure. Participants were 105 pairs of female friends (210 participants) 17 to 32 years old (M = 20.19, SD = 1.91), recruited online and around Montreal university campuses for a large study on “friendship and goals” (which included many other variables not included in the present study). At the initial session, participants came into the lab in pairs and each filled out an hour-long survey which included questions about their own and their friend’s goals, as well as measures of domain need satisfaction and well-being. All participants agreed to have their goals disclosed to their friend; each wrote down their goals on a piece of paper which was given to the other friend in the lab session. There were three online follow-ups, every three to four weeks. At each follow-up, participants were reminded of their goals and rated their goal progress. At the final follow-up, they also reported on their present domain need satisfaction and well-being. Participants were each paid $40. One hundred and ninety-six participants completed the entire study, and only four participants did not respond to any of the follow-ups.

Measures.

Domain need satisfaction. Need satisfaction was assessed at the initial testing period and at the final follow-up using the same scale as in study 3, which
was answered in each of three domains: school, health, and leisure. As we were interested in overall need satisfaction within each domain (and not in each need separately), we computed a mean of all 15 items (after reversing the negatively-worded ones) for each domain. All reliabilities were high, $\alpha = .84$ to .91.

**Goal descriptions.** Participants were asked to indicate three goals they were trying to pursue during the semester, one in each of the academic, health and leisure domains. Examples of goals were “Obtain a letter grade improvement in my worst class”, “Get into the Honors program” (for academic goal); “Do Yoga twice a week”, “Stop eating junk-food on my lunch breaks” (for health goal); and “Learn to Play Guitar”, “allotting time for writing, reading and painting” (for leisure goal).

**Goal self-concordance.** After each goal, participants were asked to rate their motivation for pursuing that goal on a nine-point Likert scale from 1 (not at all for this reason) to 9 (completely for this reason) on four items which assessed external, introjected, identified and intrinsic reasons for goal pursuit (Sheldon & Elliot, 1999). We computed a general measure of self-concordance for each goal by adding the intrinsic and identified scores and subtracting the external and introjected scores.

**Goal effort.** At each follow-up, participants were asked about the effort they expended in pursuing each of their goals using one item “I have tried really hard to achieve my goal” rated on a scale from 1 (strongly disagree) to 7 (strongly agree). The ratings were averaged across the three follow-ups ($\alpha = .82$ for academic goal, $\alpha = .79$ for health goal, and $\alpha = .85$ for leisure goal).
Goal progress. This was assessed using the same three items at each follow-up as in Study 3.

Friend reports of goal self-concordance. Each participant was provided with a list of her friend’s goals and rated their friend’s motivation for each of the friend’s goals using the same four items as for their own goals. A summary score of self-concordance was computed for each goal by adding the intrinsic and integrated scores and subtracting the external and introjected items.

Subjective well-being. Subjective well-being, consisting of positive and negative affect and life satisfaction, was assessed both at the initial testing at the final follow-up. Participants completed a nine-item scale of affect (Emmons, 1992) which included four positive (e.g., joyful) and five negative (e.g., frustrated) items, and the five-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985). All items were rated on a scale from 1 (strongly disagree) to 7 (strongly agree). All items (with negative affect items reversed) were averaged to create the measure of subjective well-being. The scale was reliable, $\alpha = .91$ at both assessments.

Results

Preliminary results. Table 5 present the means, standard deviations, and correlations of all the variables in each of the domains. Participants reported significantly different levels of need satisfaction ($F(2,418) = 68.04, p < .001$) and self-concordance ($F(2,418) = 75.96, p < .001$) across domains, reporting least need satisfaction in the academic domain, least self-concordance for the academic goal, and most self-concordance in the leisure domain. Interestingly,
this pattern was reversed for effort, with participants reporting that they exerted the most effort on their academic goal and least on their leisure goal. Similarly, participants reported most goal progress on their academic goal, and less goal progress on both the health and leisure goals. This suggests that although the academic goal was less self-concordant than the health or leisure goals, it was nevertheless the one into which participants put the most effort and on which they made the most progress.

The pattern of correlations was also different in the three domains. While effort and goal progress were both associated with need satisfaction and self-concordance for the academic goal, this was not the case for the leisure goal, in which they were not significantly related. This suggests that for leisure goals, self-concordance may not play a role in goal pursuit and attainment.

**Need Satisfaction and Self-Concordance**

We first wanted to test our hypothesis that need satisfaction would predict self-concordance, both as rated by the participants and by their friend. The two ratings were significantly positively correlated, $r = .19$ to $.31$ in the three domains, all $ps < .01$. As our data was non-independent due to its dyadic structure, we conducted multilevel analyses in HLM version 6.06 using full maximum likelihood estimation, with individuals nested within dyads. We first tested a model in which self-concordance in the academic domain was regressed on academic need satisfaction. As recommended by Kenny, Kashy and Cook (2006), need satisfaction was centered on the grand mean value for the entire sample, and the slope of need satisfaction on self-concordance was fixed across dyads, while
the intercept was allowed to randomly vary. The equation of the model at the individual level was as follows: 

$$\text{Self-concordance} = \beta_{0j} + \beta_{1j} \times (\text{Need satisfaction}) + r_{ij},$$

where $\beta_{0j}$ is the dyad intercept, $\beta_{1j}$ is the population slope coefficient estimate of self-concordance from need satisfaction, and $r_{ij}$ is error. The coefficient for need satisfaction was significant, $\beta_1 = 2.07$, $t(208) = 5.30$, $p < .001$, suggesting that need satisfaction was indeed a significant predictor of self-concordance. We next tested the same model but with the friend’s ratings of each participant’s self-concordance as the dependent variable, and found that need satisfaction was again a significant predictor, $\beta_1 = 1.08$, $t(206) = 2.53$, $p < .01$. We repeated these analyses using need satisfaction and self-concordance in the health and leisure domains. Results of all the analyses are reported in Table 6. Need satisfaction in each domain was a significant predictor of self-reported self-concordance, and in the academic and leisure domains was a significant predictor of self-concordance as rated by the friend. The only exception was the friend’s rating in the health domain, which was not significant but was in the expected direction.

**Structural Equation Modeling**

To test our main hypothesis that domain need satisfaction is an antecedent of self-concordant motivation and is the first step in the self-concordance model of goal progress, we replicated Sheldon and Elliot’s (1999) model with the addition of need satisfaction at Time 1. To test the hypothesized model, a path analysis of observed variables was conducted with EQS 6.2 using the robust maximum likelihood method of estimation. Paths were specified as per Figure 1, except for the path from need satisfaction at Time 1 to goal progress, which was
later added to better fit the data. This model parallels Sheldon and Elliot’s self-concordance model, with some important distinctions. First, need satisfaction in the domain is added as a predictor of self-concordant motivation. Secondly, a path is specified from need satisfaction at Time 1 to need satisfaction at the final follow-up, so that all other paths to final need satisfaction represent the prediction of change in need satisfaction. This is similar to what Sheldon and Elliot did with their well-being variable, which was measured both at Time 1 and at the follow-up. Finally, since we were interested in testing the model in a specific domain, we did not include a general measure of well-being. This model provided a good overall fit, Satorra-Bentler scaled $\chi^2(9) = 10.62, p = .30, CFI = .98, RMSEA = .030$. However, the path coefficient from the interaction term (self-concordance × goal progress) was not significant ($\gamma = .009, z = -1.05, n.s.$), and modification indices suggested that it be removed. Modification indices also suggested including a direct path from Time 1 need satisfaction to goal progress. As this path makes theoretical sense, we included it in the final model to better represent the data, yielding an improved model fit, $S-B \chi^2(8) = 6.19, p = .63, CFI = 1.00, RMSEA = .00$. The final model with all the standardized coefficients is illustrated in Figure 1.

To verify that the model is consistent across domains, we next tested it in the health domain. Paths were specified in the same ways as for the academic domain, but using measures of need satisfaction in the health domain and goal self-concordance, effort and progress for the health goal. This model provided an adequate overall fit, $S-B \chi^2(9) = 15.71, p = .07, CFI = .97, RMSEA = .062$. All the
path coefficients were significant (see Figure 2), although contrary to expectations, the path from the interaction term (self-concordance × goal progress) to need satisfaction at Time 4 was negative, $\gamma = -.015$, $z = -2.16$, $p < .05$. Modification indices again suggested that a direct path from need satisfaction at Time 1 to goal progress be included. The final model including the path yielded an improved fit, $S-B \chi^2(8) = 9.24$, $p = .32$, $CFI = .995$, $RMSEA = .028$ (see Figure 2 for all paths coefficients).

Finally, we tested the same model in the leisure domain (see Figure 3). The overall model fit was excellent, $S-B \chi^2(9) = 4.10$, $p = .90$, $CFI = 1.00$, $RMSEA = .000$. However, in examining the path coefficients, two paths were not significant: the path from the interaction term to need satisfaction ($\gamma = .002$, $z = .36$, $p > .30$), and the path from self-concordance to effort ($\gamma = .003$, $z = .14$, $p > .40$). This is not surprising given that self-concordance was not correlated with effort in the leisure domain, suggesting that for leisure goals, self-concordance is not predictive of goal effort. No other modification indices were significant.

In addition to testing the model separately for each domain, we sought to replicate Sheldon and Elliot’s (1999) method of aggregating goals to see whether need satisfaction would be a predictor in this aggregated model. To more closely parallel the original self-concordance model, we also included well-being both at Time 1 and at the final follow-up (with error terms correlated with each other). This model provided an excellent fit, $S-B \chi^2(19) = 22.44$, $p = .26$, $CFI = .99$, $RMSEA = .03$. All the path coefficients were significant except for the one from the interaction term to final need satisfaction (see Figure 4). Again, modification
indices suggested a path from initial need satisfaction to goal progress, which improved the fit of the overall model, $S-B \chi^2(18) = 16.05, p = .59, CFI = 1.00, RMSEA = .00$.

**Brief Discussion**

In this study, we tested the full expanded model of self-concordance, showing that need satisfaction plays an important role at the inception of goal self-concordance, both when each domain is examined individually and when the domains are aggregated. While a number of studies have tested many of the separate paths proposed by the self-concordance model, the full model has not been tested since its initial proposal by Sheldon and Elliott (1999). Our results show that need satisfaction can be conceptualized as both a precursor in the model, affecting the self-concordance of the goals, and as an outcome, affected by whether progress is made.

One surprising finding was that we failed to replicate the self-concordance model in the leisure domain. Contrary to expectations, self-concordance did not predict goal effort. It could be that while leisure goals are more intrinsically motivating than other goals, they are less important, and so less effort is put into accomplishing them, resulting in a null relationship between self-concordance and effort. Alternatively, the consistently high self-concordance scores participants gave with their leisure goals may have produced a ceiling effect, preventing us from finding the expected relationship with effort. Future studies can focus on leisure activities to examine whether there is some characteristic of leisure activities that distinguishes them from other domains. It is interesting that even
though self-concordance was not a significant predictor of effort for the leisure goal, when the goals were aggregated across domains we replicated the full self-concordance model, with significant coefficients between self-concordance and goal progress. These findings point to the importance of looking at the context of the goals rather than aggregating across goals, as important information may be lost.

An interesting addition to the model which was not theorized a priori but added post-hoc based on modification indices was the path between initial need satisfaction and goal progress. Our results suggest that need satisfaction directly influenced goal progress above and beyond the effects it had through self-concordance. Interestingly, this path did not lead to effort, but directly to goal progress, suggesting that it was not necessarily any action on the part of the person (i.e. greater effort) that was responsible for this link. This is theoretically in line with the likelihood that perceived need satisfaction is affected by the actual environment, and the type of environments that are conducive to experiencing need satisfaction make it easier to accomplish goals.

In addition to participants’ own ratings of self-concordance, we also obtained ratings made by participants’ friends of the motivation that propelled the participants to set the goals. While these ratings were significantly correlated with participants’ own ratings, these correlations were not large, suggesting that there were some discrepancies in the ways that participants and their friends viewed their own and each other’s motivations. The fact that we found that need satisfaction predicted both own and friend ratings suggests that it is an important
predictor of self-concordance in its own right, rather than as a result of the variance shared by the two constructs due to self-report. Although the finding was non-significant for friends’ ratings of health goals, the coefficient was still positive and similar in size to the leisure domain.

**Study 5**

Thus far, we have experimentally shown that need satisfaction predicts self-concordance and have tested the expanded self-concordance model. One additional question not fully addressed by the previous studies is why people rate goals associated with need-satisfying domains as more self-concordant. First, it is possible that people generally internalize all goals in a need-satisfying domain to a greater extent, such that the goals are the same but people perceive the goals as being in line with their true self. This was partially supported in Study 2, where people’s ratings of self-concordance for their goal fluctuated on a day-to-day basis based on their need satisfaction. The second possibility is that people are actually selecting ‘better’ goals – goals which are most self-concordant. Either of these two alternate processes, or their conjunction, may be responsible for our earlier findings that domain need satisfaction influences self-concordance. In order to distinguish between these two explanations, participants in the present study rated their motivation towards four specific goals (which were the same for all participants). The goals were framed as being related to either their most or least need-satisfying domain, and participants were asked to choose which of the goals they would prefer to pursue. Our hypotheses were based on the two complementary explanations. First, we hypothesized that any goals considered
relevant to a need-satisfying domain would be better internalized and rated as more self-concordant than the exact same goals in a non-need-satisfying domain. Second, we expected that people setting goals related to a need-satisfying domain would be more likely to actually select the most self-concordant goal. Finally, we were also interested in whether considering setting a goal in a need-satisfying domain would lead participants to actually take concrete steps towards pursuing that goal.

Method

Participants and procedure. One hundred eighty-two university students (79% female) participating in a large prospective study of goal pursuit completed all materials relevant to the present study. In December, participants completed measures of psychological need satisfaction in four domains (school, social life, health/physical well-being, and activities/hobbies). Two months later (in February), all participants were presented with a brief description of mindfulness meditation, a positive activity which is not inherently domain-specific. We then asked participants to think about how mindfulness meditation could be related to one of the four domains (school, social life, health/physical well-being, hobbies/activities) they were previously asked about. Based on initial ratings of domain need satisfaction, participants were randomly assigned to either write about how learning mindfulness could impact their most need-satisfying domain (need-satisfying domain condition) or their least need-satisfying domain (non-satisfying domain condition). Participants were then presented with four different goals related to mindfulness practice. They were asked to imagine themselves
pursuing each goal, and were asked about their reasons for pursuing the goal, including items assessing both autonomous and controlled motivation. They were then asked to choose which one of the four goals they would pursue if they had to pursue only one. Finally, participants were also asked whether they would want the experimenters to send them additional information on mindfulness by email.

**Materials.**

**Domain need satisfaction.** Need satisfaction in four domains (school, social life, health, and activities/hobbies) was assessed using the same items as in Study 1.

**Goal self-concordance.** Participants were asked to imagine pursuing each of four goals (randomized within participants) related to mindfulness: (1) Practicing mindfulness meditation for 15 minutes every day for the next week; (2) Practicing mindfulness meditation for 15 minutes 3 times a week for the next month; (3) Finding some reading materials to further learn about mindfulness meditation; and (4) Taking a free online workshop on mindfulness meditation. After each mindfulness goal they rated the extent to which the goal was extrinsic (“Somebody else would want me to pursue this goal, or I would get something from somebody for pursuing it.”), introjected (“I ought to strive for this and would feel ashamed, guilty, or anxious if I didn’t pursue this goal.”), intrinsic (“This goal would provide me with fun and enjoyment, and I would pursue it simply for my interest in the experience itself.”) and integrated (“This goal fits well with who I am and reflects what I value most in life.”). In line with our other
studies, we computed mean goal self-concordance using the mean of the intrinsic and integrated items and the mean of the reversed extrinsic and introjected items.

**Results**

To test our first hypothesis that people internalize goals situated in a need-satisfying domain to a greater extent than goals related to a non-satisfying domain, we looked at the mean self-concordance for all four goals in both conditions (related to either a need-satisfying or a non-satisfying domain). A one-way ANOVA showed that there was no difference between conditions in mean goal self-concordance ($M = 4.58$, $SD = .93$ for need-satisfying condition; $M = 4.48$, $SD = 1.10$ for non-satisfying condition), $F(1,180) = .45$, n.s. However, when we looked separately at autonomous (mean of intrinsic and integrated) and controlled (mean of extrinsic and introjected) motivation, we found that participants in the need-satisfying domain condition reported more autonomous motivation ($M = 4.31$, $SD = 1.49$) than those in the non-satisfying domain condition ($M = 3.83$, $SD = 1.58$), $F(1,180) = 4.30$, $p < .05$. This was not the case for controlling motivation, $M = 3.15$, $SD = 1.38$ and $M = 2.88$, $SD = 1.27$ for the need-satisfying and non-satisfying conditions respectively, $F(1, 180) = 1.92$, n.s. This provides partial support for the first hypothesized process, that the goals set in a need-satisfying domain are more self-concordant because goals are more likely to be considered in line with the self independently of the goal content.

To test our second hypothesis that people do select more self-concordant goals, we looked at the likelihood of selecting the most self-concordant goal in each condition. A new variable was created based on whether the one goal they
selected to pursue was rated as most self-concordant or tied for most self-concordant compared to their ratings of the other goals (coded as 1), or was not among the most self-concordant (coded as 0). In the need-satisfying condition, 58.6% of participants selected their most self-concordant goal to pursue, compared to 42.1% in the non-need-satisfying condition (Pearson $\chi^2 = 4.96$, $p<.05$). Similarly, in a binary logistic regression, condition was a significant predictor of selecting the most self-concordant goal, $B=.673$, Wald $\chi^2 = 4.98$, $p<.05$. The analysis showed that participants in the need-satisfying condition were almost twice as likely to select the most self-concordant goal compared with those in the non-satisfying condition (odds ratio = 1.95). This held true even after we controlled for the ease of the chosen goal.

Finally, we were interested in whether participants in the need-satisfying domain would be more likely to take steps towards pursuing the goal. We asked all participants whether they were interested in receiving an email with additional information about mindfulness meditation, coded as 1 = yes and 0 = no. Among participants in the need-satisfying condition, 65.5% indicated they would like to receive further info, compared with 50.5% of participants in the non-satisfying condition (Pearson $\chi^2 = 4.18$, $p < .05$). A binary logistic regression analysis showed that those in the need-satisfying condition were 87% more likely to request additional information, $B = .62$, Wald $\chi^2 = 4.15$, $p < .05$, odds ratio = 1.86.

**Brief Discussion**

In this study, we tested two hypotheses for explaining why people rate goals in a need-satisfying domain as more self-concordant, finding evidence for
both. First, this study showed that people generally perceive potential goals in a need-satisfying domain as more autonomous than identical goals set in a non-satisfying domain. Although we did not find any results for a combined score of self-concordance, this is likely because the scores for controlling motivation seemed to follow the same trend as autonomous motivation, with people reporting greater overall motivation (both autonomous and controlled reasons) for goals set in need-satisfying domains. This is similar to prior findings for academic motivation, which have shown that a large proportion of students experience high levels of both autonomous and controlled motivation (combined with low amotivation; Ratelle, Guay, Vallerand, Larose, & Senecal, 2007). Although SDT concerns itself with the type of motivation, the total amount of motivation may also sometimes be important to consider. Someone who had no interest in pursuing a given goal would not be likely to endorse any of the reasons for pursuing the goal, resulting in lower scores on both the autonomous and controlled items, as was evidenced in the present study when the meditation goals were related to a non-satisfying domain. However, since only ratings of autonomous (and not controlled) motivation were significantly different across the two conditions, and since there is some evidence suggesting that autonomous, rather than controlled motivation, drives the positive effects of self-concordant goals on goal progress (Koestner et al., 2008), we thought that our results helped to demonstrate that people’s perceptions of their goals depend on the need satisfaction experienced in the domain in which the goal is set. These results also fit well with our results from Study 2, which showed fluctuations in perceived
goal self-concordance in response to changes in domain need satisfaction. Overall, results from these two studies suggest that people are more likely to integrate goals related to need-satisfying domains into their core self.

We also found evidence supporting our second hypothesis. When considering multiple goals that fall within a need-satisfying domain, participants more often chose the most self-concordant goal, compared to when considering goals within a less need-satisfying domain. This supports the original self-concordance model hypothesis that people’s deliberations over which goals to choose may be imperfect, in that people sometimes choose to pursue goals that are not reflective of their underlying values and interests (Sheldon & Elliot, 1999). Not only do people in need-satisfying domains perceive their goal choices as generally more autonomous, they are then more likely to actually select the goal which is most self-concordant and to take concrete steps towards pursuing that goal (in the form of requesting more information).

**General Discussion**

The present research demonstrates that domain need satisfaction is an antecedent to adopting self-concordant goals, thereby extending the self-concordance model (Sheldon & Elliot, 1999). While previous research has identified personality characteristics that lead to greater goal self-concordance, this is the first work to explain the origins of within-person variation in the self-concordance of goals. Across five studies, including experimental, prospective, and daily diary methodologies, we found that domain-related need satisfaction
predicts the extent to which people adopt self-concordant goals in those domains, laying the foundation for successful goal pursuit.

In the first two studies, we found that participants set more self-concordant goals when assigned to come up with a goal in a self-generated need-satisfying domain rather than non-satisfying domain. This was true for both general goals (Study 1) and for short-term goals (Study 2). Moreover, in Study 2 we showed that daily fluctuations in domain need satisfaction result in fluctuations in perceived goal self-concordance: When people experience additional need satisfaction in a domain, they perceive goals related to that domain as more in line with their core self.

In studies three and four, participants indicated their need-satisfaction in set domains, and also completed measures that tapped into the self-concordance of the goals they were pursuing. This allowed us to examine naturally occurring goal pursuit over the course of a term, testing the extended self-concordance model which included the downstream effects of domain need satisfaction and self-concordance on goal pursuit. In addition, by having participants in Study 4 rate their friend’s motivation for their goals, we were able to rule out the idea that self-concordance is purely a self-perception phenomenon. Replicating our findings with friend ratings demonstrates that there are characteristics of the relationship between the self and the goal that close others are able to perceive, providing stronger evidence for the domain need satisfaction – self-concordance link.
In Study 5 we showed that when considering need-satisfying versus non-satisfying domains, individuals setting a goal in a need-satisfying domain are more likely to select more self-concordant options. This supports the notion that a lack of self-concordance arises because “some people’s deliberations may have been flawed” (Sheldon & Elliott, 1999, pg. 482). Indeed, when given many choices of goals to pursue, participants selecting a goal in a domain where they experienced relatively low need satisfaction were less likely to choose the goal that was most representative of their true self. In the same study, we showed that people also perceive the same goals as more autonomous when these goals are linked to a need-satisfying versus non-satisfying domain, suggesting that it is not only people’s deliberations that can be affected but their perceptions of the choices themselves. This is in line with the results of our second study, which showed that domain need satisfaction influences perceptions of goal self-concordance.

**Implications for the Self-Concordance Model and SDT**

The original self-concordance model only addressed the goal-striving phase and its consequences, ignoring the *decision phase* in which individuals choose which goals to select (Gollwitzer, 1990). The present research extends the self-concordance model by showing that domain need satisfaction can play a role in whether self-concordant goals are selected. According to Gollwitzer’s (1990) action phases model of goal striving, people use feasibility and desirability as criteria to determine which of their wishes to pursue and turn into goals. Since need-satisfying settings encourage the free development and expression of one’s
true self (Deci & Ryan, 2000), it may be that people believe pursuing self-concordant goals in need-satisfying domains to be more feasible than in non-satisfying domains. Additionally, in need thwarting domains where contingencies for acceptance or approval may be in place, attainment of non-self-concordant wishes or goals may nevertheless be highly desirable as a means of obtaining such approval. Future research can examine these two pathways (through increased feasibility and/or desirability) to determine whether one or both of them is responsible for the link between domain need satisfaction and goal selection.

In addition to looking at need satisfaction as a precursor of self-concordant goals, Studies 3 and 4 tested the full self-concordance model adapted to include initial domain need satisfaction. Replicating the original studies on the self-concordance model (Sheldon & Elliot, 1999), greater goal progress resulting from greater self-concordance led to increases in need satisfaction at the end of the semester. Indeed, it would seem as if need satisfaction, self-concordance and positive outcomes are all part of a cycle, with one built upon the other, leading to an “upward spiral” (Sheldon & Houser-Marko, 2001). Evidence for such a pattern emerged in a prior study which showed that goal attainment led to more self-concordant goals set in the following semester (Sheldon & Houser-Marko, 2001). Interestingly, in their model Sheldon and Houser-Marko considered enhanced adjustment as a direct result of goal attainment, and greater self-concordance in future striving as a parallel, but separate effect. Our findings on the role of need satisfaction suggest that both increased adjustment and greater self-concordance in future strivings are consequences of the need satisfaction experienced through
goal attainment. If need satisfaction is a prerequisite to setting self-concordant goals, then the need satisfaction experienced as a result of goal attainment would lead people to set more self-concordant goals in the future. Although it may appear that this cycle of need-satisfaction predicting self-concordance which then predicts further need satisfaction would result in people experiencing greater and greater levels of need satisfaction, there must necessarily exist a break in the cycle. This break may be due to changes in the environment in which goals are pursued. While people can control their strivings and to some extent their perceptions of their environment and even some aspects of the environment itself, some features of the environment are outside of their control and may change in such a way as to thwart the needs despite successful goal pursuit. For example, while Mary may be experiencing need satisfaction at her job, and setting and achieving self-concordance goals at work, she may one day be transferred to a new division to work on a project she does not particularly enjoy with a new supervisor who is controlling and critical.

Although in the present studies we have used psychological need satisfaction as a predictor of goal self-concordance and the positive outcomes which ensue, we did not investigate the conditions which give rise to such experiences of need satisfaction. Previous research has shown that need satisfaction is linked to the environmental supports for autonomy, competence and relatedness which are present in a given domain (Deci & Ryan, 2000). Indeed, in his paper on the hierarchical nature of motivation, Vallerand (1997) proposed that need satisfaction was itself a mediator between social factors (such
as contextual autonomy support) and motivation. This has been supported by studies which found that autonomy-supportive climates were predictive of need satisfaction which in turn predicted motivation and positive outcomes (e.g., Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; Standage, Duda, & Ntoumanis, 2003). However, although need satisfaction is based on the supports available in the environment itself, it is also contingent on the individual’s “inner resources to find or construct the necessary nourishment” (Deci & Ryan, 2000, pg. 229). It is thus likely that experiences of need satisfaction are not merely a proxy for the amount of support available in a domain, but represent a separate entity which could serve as an independent variable predicting important outcomes in its own right. Future research is needed to determine the extent to which the supports available in a domain influence need satisfaction and goal self-concordance, using objective measures to assess the quality of social climates.

**Role of Domains in Goal Pursuit**

The present research also highlights the important, and often neglected, relationship of goals to their broader motivational framework. Goals do not exist in isolation, but are instead situated within domains which explain the majority of the variance in goal pursuit. By aggregating across domains, important information regarding the effects of that specific domain is lost. As was seen in the third study, looking within-person among domains explained over 70% of the variance in need satisfaction, self-concordance, and goal progress. This is similar to the proportions previously found by Milyavskaya and Koestner (2011), who showed that 81% of the variance in need satisfaction among important life
domains was within-person (between domains). Similarly, another study (Nurmi, Salmela-Aro, & Aunola, 2009) found that over 75% of the variance in people’s appraisals of their goals on each of 12 different dimensions was between goals. These results suggest that goal pursuit is not simply a matter of a global personal orientation towards one’s goals, or of general feelings of need satisfaction but that there is something unique about the domains which explain goal pursuit. It seems that the really interesting question is not “why do some people attain their goals whereas others do not?”, but “why does each of us attain certain of our goals whereas we fail at others?” The answer suggested in the present studies seems to be that each of us benefits from setting goals in life domains where we perceive our basic psychological needs to be satisfied. In these domains, our goals are especially likely to be attuned to our true interests and values, and this self-attunement fuels effortful persistence. Understanding how these domains influence and shape the goals people adopt, the resources (both environmental and psychological) that they have available to aid in goal pursuit, and the potential drawbacks and impediments that come from the domain itself are all critical for developing an accurate understanding of what leads people to succeed or fail in their goals. Further examination of how domains influence the self-regulation and pursuit of specific goals will likely be a fruitful area of inquiry.

In addition to showing support for our hypotheses across participants in multiple domains, we also demonstrated that need satisfaction is a precursor of self-concordance (which then affects goal progress) on a within-person level. An individual is likely to be involved in some domains that are more need-satisfying
than others, and is more likely to set a self-concordant goal and to achieve that
goal in those domains where greater need satisfaction is experienced. The within-
person analysis is also an effective way of ruling out the role that individual
differences may play in this process. However, it still does not account for
potential domain characteristics which could influence goal pursuit. While in the
third study we controlled for two such characteristics, the importance of the
domain and the time spent in the domain, other domain characteristics such as the
motivation for the domain as a whole could also play a role. For example, a
person could be intrinsically motivated to do well in school, yet some school
goals could be inherently less enjoyable – studying for an exam in a required
course could potentially be less intrinsically motivating than writing a research
paper on a topic of one’s choice for an elective class. Future research could
examine the interplay between domain and goal motivation, as well as look at
other potential domain characteristics that could influence goal pursuit in a given
domain.

**Future Directions**

One issue raised in our paper is the effect of the environment in need-
satisfying versus non-satisfying domains. Our analyses in study 4 showed that, in
addition to the path from need satisfaction to self-concordance to effort to goal
pursuit, there was a direct effect of domain need satisfaction on goal pursuit. One
of the possible explanations for this effect is that the environmental conditions of
need-satisfying domains are particularly conducive to goal pursuit, independent of
self-concordance. For example, in environments where they have a great deal of
autonomy, individuals may face fewer obstacles from other people, compared to environments with low autonomy. Similarly, a high degree of competence in a particular domain may result in more efficient goal progress; with the same amount of effort, someone with high competence would likely be able to have superior goal pursuit, holding all other factors constant. Finally, domains where people enjoy a sense of connectedness with others may bring its own benefits for goal pursuit, from having helpful others assist with goal pursuit, through the priming of important goals, or by helping monitor goal progress (Fitzsimons & Finkel, 2010). Examining the possible alternative pathways through which need-satisfying domains result in greater goal progress would improve our understanding of how domains influence motivation and self-regulation.

Although the current research provides further evidence for the beneficial effects of self-concordant goals on goal pursuit, one omission at present is an examination of the limitations and moderators that can alter how the self-concordance goal model operates. Our research provides evidence that these moderators may exist, as we found cases where the model was not accurately predicting people’s actual behavior. In Study 4 we found that people reported high levels of self-concordance with their leisure goals compared to academic goals, yet they tended to engage in more effortful pursuit of their academic goal, leading to increased goal progress. In that study, self-concordance did not help predict the effort that people put into their leisure goals. Although the breakdown in the self-concordance model in the leisure domain could be due to ceiling effects of self-concordance, further examination of self-concordant goals in the
leisure domain may help us develop moderators and boundary conditions that enhance our understanding how self-concordant goals operate.

In the present studies, we examined overall need satisfaction by combining the ratings of autonomy, competence, and relatedness. This was done for a number of reasons. First, although initial research testing the existence and importance of the needs considered the effects of each need separately, most of this research has found similar effects of these three needs on basic outcomes (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). This is not surprising, considering that theoretically the three needs are considered to be universally important (Deci & Ryan, 2008), and that they are often highly correlated (e.g., Gagné, 2003). Given that all three needs are essential, it follows that missing any of them would result in sub-optimal outcomes. Other recent research which examines more complex questions about the role of these needs typically combines the three needs into one overall measure of need satisfaction. For example, overall need fulfillment in relationships has been shown to be related to numerous indicators of individual and relational well-being (Patrick et al., 2007), and overall need satisfaction at work has been linked with job satisfaction and other job-related outcomes (Vansteenkiste et al., 2007). Alternatively, the three needs are often included as indicators of a latent construct of need satisfaction in measurement models, with the latent variable of overall need satisfaction then used in the structural part of the models (e.g., Niemiec, Ryan, & Deci, 2009; Deci et al., 2001). Based on these research traditions, we chose to examine the effects of overall need satisfaction rather than the effects of each need separately.
Examining the three needs together also fit with our paper’s overall focus on the general role of domains. Our goal was to demonstrate that overall need satisfaction within a domain leads to self-concordant goals, to extend and support the self-concordance model. Examining the role of individual needs would be further complicated by the fact that the needs are not independent of each other (see Footnote 3). In order to fully untangle the role of each need, future research can experimentally manipulate the availability of each of the three needs to examine their unique and shared impact on self-concordance, similarly to what Sheldon and Filak (2008) did for task motivation and outcomes.

In conclusion, the present investigation provides an empirical test of some of the key propositions of self-determination theory, furthering our understanding on the relations between need satisfaction, self-concordant motivation, goal pursuit and psychological well-being. In addition to extending the self-concordance model, this research enhances our understanding of factors affecting the creation and adoption of new goals, and demonstrates the importance of taking the motivational context into account when examining goal pursuit. By studying the interlinking motivational processes related to need satisfaction, self-concordance, effort and goal progress, we can better understand what leads to successful self-regulation. Such an understanding can be used to help people to achieve their goals and lead to an upward spiral of improved psychological well-being.
References


Alpha was higher (.88 for the need-satisfying domain, .80 in the non-satisfying domain) when the reversed autonomy item was removed. Because the reversed item (feeling controlled) is an important component of autonomy, we kept it in the analyses despite its poor fit with the other items. Removing the item did not affect the results.

We controlled for gender in all of our analyses because preliminary analyses revealed that males were more likely to report having achieved their goal than females ($\chi^2 = 3.95, p < .05$). Gender did not significantly affect ratings of need satisfaction or goal self-concordance.

Although SDT states that all the three needs are crucial and that missing any one of these needs should result in sub-optimal outcomes, some readers may be interested in the unique contribution of each need. However, since each of the needs is not independent but is correlated with the other needs, including the three needs in a regular multiple regression analysis and interpreting the beta weights (as is commonly done) provides biased estimates of the role of each IV since some of the IVs are ‘given credit’ for explained variance that is shared with the one or more of the other IVs (Pedhazur, 1997; for a thorough discussion of the problem, see Nathans, Oswald, & Nimon, 2012). Conducting a regression commonality analysis (Nimon, 2010) showed that the commonality between the needs was responsible for between 30-50% of the explained variance in self-concordance. In all of the domains the unique portion of either autonomy or competence (or both separately) were responsible for a large proportion of the
variance; while relatedness did not seem to play a large unique role, this may have been due to a restricted range of relatedness ratings (particularly in the relationship and friendship domains). A complete discussion of these analyses is outside of the scope of this paper.

4 As our participants were paired in dyads, we could not assume non-independence of the data. However, we did not expect the between-dyad variance to play a significant role in the data – that is, we expected our model to equally fit the within-subject and between-subject covariance. To test this proposition, we used a multilevel structural equation modeling technique (see Hox 2002; Stapleton 2006) which allows both the within and between matrices to be modeled together according to the hypothesized model. In this analysis, both matrices are expected to vary independently, but each parameter estimate and error term at the between level is constrained to be equal to the one at the within level. Fit indices for this model were excellent for all 3 contexts, \( \chi^2(24) = 27.16, p = .30, CFI = .99, GFI = .96, RMSEA = .025 \) for academic; \( \chi^2(24) = 30.37, p = .17, CFI = .98, GFI = .96, RMSEA = .036 \) for health; and \( \chi^2(24) = 25.25, p = .39, CFI = 1.00, GFI = .96, RMSEA = .016 \) for leisure, thus suggesting that the same hypothesized model held at both the between and within levels. When the constraints were released, the model fit was worse for each of the domains, confirming that the parameters at the between and within level were equivalent. Since both the within-subject and between-subject matrices fit the model equally, we computed our main path analyses on the whole variance (without separating between and within variance) in order to test the significance of the parameter
estimates. The details of the path analysis using the whole variance are presented in the results section.

5 Due to strong multivariate kurtosis found in the data (Mardia’s coefficient >10 in all analyses; values >5 are suggestive of non-normal distribution), we report robust statistics.

6 The interaction term was incorporated into our research solely based on Sheldon and Elliott’s (1999) model; whether it was or was not significant does not affect our research as this aspect of the model was not a focus of our research. Indeed, although two early studies found the interaction effect (Sheldon & Kasser, 1998; Sheldon & Elliott, 1999), no other studies have since replicated this effect, while other research that attempted to test it found no evidence for the role of the interaction (Koestner & Milyavskaya, 2012).

7 We did not test Sheldon & Elliot’s (1999) model as an alternate because our model encompassed theirs. If their model was better, the link between need satisfaction at time 1 and self-concordance in our model would not have been significant.

8 We would like to thank anonymous reviewer 1 for his/her suggestion regarding this explanation for how the cycle can be broken.
Table 1

Mean domain and goal characteristics in need-satisfying and need-thwarting conditions in Study 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Need-satisfying</th>
<th>Non-need-satisfying</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain Need Satisfaction</td>
<td>5.00(.91)</td>
<td>3.75(.64)</td>
<td>108.24**</td>
</tr>
<tr>
<td>Self-Concordance</td>
<td>2.43(5.31)</td>
<td>-.86(4.89)</td>
<td>17.63**</td>
</tr>
<tr>
<td>Goal Importance</td>
<td>5.94(1.00)</td>
<td>5.92(1.12)</td>
<td>.02</td>
</tr>
<tr>
<td>Goal Commitment</td>
<td>5.83(1.06)</td>
<td>5.63(1.12)</td>
<td>1.48</td>
</tr>
<tr>
<td>Goal Difficulty</td>
<td>5.17(1.44)</td>
<td>5.38(1.28)</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Note: **p<.001
Table 2.  
Means, Standard Deviations and Correlations of Study 3 Variables.

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>4.64</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Importance</td>
<td>6.23</td>
<td>1.12</td>
<td>.22*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Time spent</td>
<td>5.36</td>
<td>1.46</td>
<td>.14</td>
<td>.33***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self-concordance</td>
<td>4.99</td>
<td>1.03</td>
<td>.29**</td>
<td>.17†</td>
<td>.16†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>4.79</td>
<td>1.10</td>
<td>.32**</td>
<td>.22*</td>
<td>.29**</td>
<td>.31**</td>
<td></td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>4.46</td>
<td>.95</td>
<td>.64***</td>
<td>.27**</td>
<td>.23*</td>
<td>.39***</td>
<td>.58***</td>
</tr>
<tr>
<td><strong>Health Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>4.99</td>
<td>.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Importance</td>
<td>6.03</td>
<td>1.21</td>
<td>.23**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Time spent</td>
<td>2.38</td>
<td>1.35</td>
<td>.17†</td>
<td>.21*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self-concordance</td>
<td>5.46</td>
<td>1.02</td>
<td>.32***</td>
<td>.17†</td>
<td>.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>3.98</td>
<td>1.62</td>
<td>.25**</td>
<td>.36***</td>
<td>.11</td>
<td>.43***</td>
<td></td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>4.69</td>
<td>.95</td>
<td>.56***</td>
<td>.25**</td>
<td>.15</td>
<td>.43***</td>
<td>.43***</td>
</tr>
<tr>
<td><strong>Relationship Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>6.01</td>
<td>.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Importance</td>
<td>6.68</td>
<td>.69</td>
<td>.38***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Time spent</td>
<td>5.53</td>
<td>1.72</td>
<td>.07</td>
<td>.21*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self-concordance</td>
<td>5.58</td>
<td>1.11</td>
<td>.31**</td>
<td>.17†</td>
<td>-.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>5.09</td>
<td>1.27</td>
<td>.39***</td>
<td>.31**</td>
<td>.20*</td>
<td>.23*</td>
<td></td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>5.83</td>
<td>.98</td>
<td>.65***</td>
<td>.28**</td>
<td>.17†</td>
<td>.24*</td>
<td>.44**</td>
</tr>
<tr>
<td><strong>Friendship Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>5.68</td>
<td>.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Importance</td>
<td>6.2</td>
<td>1.15</td>
<td>.48***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Time spent</td>
<td>3.49</td>
<td>1.86</td>
<td>.42***</td>
<td>.42***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self-concordance</td>
<td>5.66</td>
<td>.93</td>
<td>.22*</td>
<td>.08</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>4.52</td>
<td>1.44</td>
<td>.29**</td>
<td>.20*</td>
<td>.28**</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>5.60</td>
<td>1.06</td>
<td>.73***</td>
<td>.49***</td>
<td>.43***</td>
<td>.28**</td>
<td>.43***</td>
</tr>
</tbody>
</table>

Note: †p<.10, *p<.05, **p<.01, ***p<.001
Table 3. Across-person analyses for each domain in Study 3.

<table>
<thead>
<tr>
<th></th>
<th>Academic</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>SE</td>
<td>( t )</td>
<td>( \beta )</td>
<td>SE</td>
<td>( t )</td>
<td>( \beta )</td>
<td>SE</td>
</tr>
<tr>
<td><strong>Predicting Self-Conc.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain t1 need sat</td>
<td>.27</td>
<td>.09</td>
<td>2.98**</td>
<td>.30</td>
<td>.09</td>
<td>3.25**</td>
<td>.47</td>
<td>.15</td>
</tr>
<tr>
<td>Domain time</td>
<td>.07</td>
<td>.06</td>
<td>1.09</td>
<td>.06</td>
<td>.07</td>
<td>.87</td>
<td>-.06</td>
<td>.06</td>
</tr>
<tr>
<td>Domain importance</td>
<td>.07</td>
<td>.08</td>
<td>.78</td>
<td>.07</td>
<td>.07</td>
<td>.97</td>
<td>.13</td>
<td>.15</td>
</tr>
<tr>
<td><strong>Predicting goal progress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-concordance</td>
<td>.28</td>
<td>.09</td>
<td>3.04**</td>
<td>.62</td>
<td>.14</td>
<td>4.58**</td>
<td>.21</td>
<td>.10</td>
</tr>
<tr>
<td>Domain time</td>
<td>.17</td>
<td>.07</td>
<td>2.43†</td>
<td>.01</td>
<td>.10</td>
<td>.12</td>
<td>.11</td>
<td>.07</td>
</tr>
<tr>
<td>Domain importance</td>
<td>.10</td>
<td>.09</td>
<td>1.10</td>
<td>.36</td>
<td>.11</td>
<td>3.36**</td>
<td>.38</td>
<td>.16</td>
</tr>
<tr>
<td><strong>Predicting t4 need sat</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain t1 need sat</td>
<td>.51</td>
<td>.07</td>
<td>7.63**</td>
<td>.48</td>
<td>.07</td>
<td>6.62**</td>
<td>.77</td>
<td>.10</td>
</tr>
<tr>
<td>Goal Progress</td>
<td>.34</td>
<td>.06</td>
<td>6.15**</td>
<td>.19</td>
<td>.04</td>
<td>4.46**</td>
<td>.18</td>
<td>.06</td>
</tr>
</tbody>
</table>

Note: †\( p<.10 \), *\( p<.05 \), **\( p<.01 \).
Table 4. Within-person analyses for Study 3.

<table>
<thead>
<tr>
<th>Predicting Self-Conc.</th>
<th>b</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain t1 need sat</td>
<td>.25</td>
<td>.05</td>
<td>4.75**</td>
</tr>
<tr>
<td>Domain time</td>
<td>-.07</td>
<td>.02</td>
<td>-3.32**</td>
</tr>
<tr>
<td>Domain importance</td>
<td>.12</td>
<td>.06</td>
<td>2.16*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predicting goal progress</th>
<th>b</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-concordance</td>
<td>.22</td>
<td>.04</td>
<td>3.06**</td>
</tr>
<tr>
<td>Domain time</td>
<td>.19</td>
<td>.03</td>
<td>6.13**</td>
</tr>
<tr>
<td>Domain importance</td>
<td>.26</td>
<td>.07</td>
<td>3.53**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predicting t4 need sat</th>
<th>b</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain t1 need sat</td>
<td>.79</td>
<td>.04</td>
<td>19.77**</td>
</tr>
<tr>
<td>Goal Progress</td>
<td>.15</td>
<td>.03</td>
<td>5.29**</td>
</tr>
</tbody>
</table>

Note: †p<.05, *p<.10, **p<.01.
Table 5.

*Means, Standard Deviations and Correlations of Study 4 Variables.*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>4.60</td>
<td>.97</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Self-concordance</td>
<td>4.60</td>
<td>5.68</td>
<td>.36***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Friend report self-concordance</td>
<td>3.89</td>
<td>5.80</td>
<td>.22**</td>
<td>.31***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Effort</td>
<td>4.87</td>
<td>1.29</td>
<td>.20**</td>
<td>.27***</td>
<td>.26***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>4.31</td>
<td>1.13</td>
<td>.26***</td>
<td>.30***</td>
<td>.13†</td>
<td>.68***</td>
<td>--</td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>4.39</td>
<td>.95</td>
<td>.63***</td>
<td>.28***</td>
<td>.18*</td>
<td>.24**</td>
<td>.34***</td>
</tr>
<tr>
<td><strong>Health Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>4.91</td>
<td>.92</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Self-concordance</td>
<td>7.59</td>
<td>5.12</td>
<td>.54***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Friend report self-concordance</td>
<td>7.87</td>
<td>5.33</td>
<td>.12†</td>
<td>.19**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Effort</td>
<td>4.09</td>
<td>1.39</td>
<td>.04</td>
<td>.17*</td>
<td>.13†</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>4.01</td>
<td>1.44</td>
<td>.19**</td>
<td>.24**</td>
<td>.11</td>
<td>.78***</td>
<td>--</td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>4.78</td>
<td>.96</td>
<td>.63***</td>
<td>.34***</td>
<td>.10</td>
<td>.07</td>
<td>.28***</td>
</tr>
<tr>
<td><strong>Leisure Domain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Need satisfaction t1</td>
<td>5.37</td>
<td>.89</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Self-concordance</td>
<td>9.90</td>
<td>4.98</td>
<td>.39***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Friend report self-concordance</td>
<td>10.89</td>
<td>4.29</td>
<td>.14*</td>
<td>.29***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Effort</td>
<td>3.86</td>
<td>1.56</td>
<td>.08</td>
<td>.02</td>
<td>.06</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>5. Goal progress</td>
<td>4.07</td>
<td>1.61</td>
<td>.07</td>
<td>.05</td>
<td>.00</td>
<td>.87***</td>
<td>--</td>
</tr>
<tr>
<td>6. Need satisfaction t4</td>
<td>5.19</td>
<td>.96</td>
<td>.65***</td>
<td>.22**</td>
<td>.11</td>
<td>.17*</td>
<td>.19**</td>
</tr>
</tbody>
</table>

Note: †p<.10, *p<.05, **p<.01, ***p<.001
Table 6.

*Study 4: Predicting self-concordance from need satisfaction*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Self-report</th>
<th></th>
<th>Friend’s rating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>t</td>
<td>B</td>
<td>t</td>
</tr>
<tr>
<td>Academic</td>
<td>2.08</td>
<td>5.30***</td>
<td>1.08</td>
<td>2.53*</td>
</tr>
<tr>
<td>Health</td>
<td>3.01</td>
<td>8.29***</td>
<td>.58</td>
<td>1.31</td>
</tr>
<tr>
<td>Leisure</td>
<td>2.17</td>
<td>4.98***</td>
<td>.62</td>
<td>2.14*</td>
</tr>
</tbody>
</table>

*p<.05, ***p<.001.*
Figure 1.

Parameter estimates of structural equation model for the academic goal. All paths indicated in black are significant, p<.05. Dashed paths are non-significant.
Figure 2.

Parameter estimates of structural equation model for the health goal. All paths indicated in black are significant, p<.05.
Figure 3.

Parameter estimates of structural equation model for the leisure goal. All paths indicated in black are significant, p<.05. Dashed paths are non-significant.
Figure 4.

Parameter estimates of structural equation model aggregated across domains. All paths indicated in black are significant, p<.05. Paths with double headed arrows indicate a correlation. Dashed paths are non-significant.
Bridge to Article 3

The first two articles examined the effects of domain need satisfaction on domain-specific outcomes, including motivation for engaging in the domain and for pursuing an important goal set in that domain (goal self-concordance), goal progress, and domain well-being. However, in both articles, the effects of need satisfaction in important life domains on overall or general well-being were largely ignored. Although in Article 2 one study (Study 4) did look at the effects on general well-being, this was done only to replicate prior research on goal self-concordance, and as such need satisfaction was aggregated across domains and any potential differences between domains were not explored. Article 3 thus examines the role of domain need satisfaction in multiple domains for global well-being. Additionally, since the first two articles found large within-person variability in need satisfaction experienced across domains Article 3 also explores the effects of this variability in need satisfaction across domains on overall adjustment.

In Article 3, the role of need satisfaction in the home, school, work, and friendship domains on global outcomes is examined. These outcomes include general well-being (Studies 1 and 2) as well as school adjustment including drop-out intentions (all three studies). Focusing on need satisfaction in multiple domains simultaneously allows for an investigation of whether these disparate domains contribute to the same extent to global positive outcomes. According to self-determination theory, the three psychological needs must be satisfied in all
areas of one’s life for optimal outcomes; Article 3 examines this proposition using some of the most important and commonly mentioned domains.

Another innovation of Article 3 is its focus on a younger population. While in the first two articles data was collected from university students and community adults, Article 3 uses adolescent participants ages 11 to 18. Different contexts and roles become particularly salient in adolescence, leading to the development of multiple role-related selves at this stage (Harter et al, 1997; Harter 1999). Particular features of these contexts, such as the support for the basic needs provided in the relevant domains, should be particularly critical in influencing a person’s context-specific self-concept and self-esteem (LaGuardia & Ryan, 2002). For example, a teenager who feels autonomous, competent, and connected to her teacher in the classroom is likely to develop a positive academic self-concept, but if she is rejected by her peers or pressured to behave in a certain manner to fit in with the other girls in her school her self-worth in the interpersonal domain will likely be compromised. Such differentiation and variability should, in turn, impact one’s general self-concept and well-being (Kernis & Goldman, 2003).

Finally, an important innovation of Article 3 is the focus not only on the role of need satisfaction in various domains but also on the variability across domains. Extensive research on life balance highlights the dangers of investing too heavily in one domain such as work at the expense of other areas of one’s life such as family (e.g., Grant-Vallone & Donaldson, 2001). Conversely, a balanced time investment into various life domains has been linked with increased well-
being (Sheldon et al., 2010). Additionally, other types of variability, including disparity among the three needs themselves (Sheldon & Niemiec, 2006), variable self-esteem (Kernis, 2005), attachment (LaGuardia et al., 2000), and core affect (Kuppens, Van Mechelen, Nezlek, Dossche, & Timmermans, 2007) have been linked to decreased psychological adjustment. Similarly, an imbalance of need satisfaction across important life domains was expected in Article 3 to be related to poorer adjustment.
Balance Across Contexts: Importance of Balanced Need Satisfaction Across Various Life Domains.

Marina Milyavskaya, McGill University

Isabelle Gingras, McGill University

Geneviève A. Mageau, Université de Montréal

Richard Koestner, McGill University

Hugo Gagnon, McGill University

Jianqun Fang, Ningxia Medical College

Julie Boiché, Université Joseph Fourier (Grenoble, France)
Chapter 4  Balance Across Contexts  133

Abstract

Self-determination theory posits that satisfaction of three basic psychological needs -- autonomy, competence, and relatedness -- are required for psychological well-being (Deci & Ryan, 2000), and a recent study showed that the balance in the satisfaction of these three needs independently affects well-being (Sheldon & Niemiec, 2006). The present investigation builds on these findings by examining the balance of adolescents’ need satisfaction across distinct life contexts. The results of three studies show that adolescents who experience a balance of need satisfaction across important life contexts, including at school, at home, with friends, and in part-time jobs, reported higher well-being, and better school adjustment. This finding emerged consistently across 4 countries and across multiple measures of school adjustment including teacher reports. Together, these results support previous research that highlights the importance of consistency for psychological functioning.

Keywords: self-determination theory, psychological need satisfaction, adolescents, adjustment
The Importance of Balanced Need Satisfaction Across Various Life Domains

Adolescence is a time when individuals begin to discover themselves and to explore different roles. Many contexts take on greater importance, with friends, school, and family responsibilities all vying for attention. Adolescents’ experiences in each of these contexts can play a crucial role in adjustment and in developmental outcomes. We are interested in one specific aspect of that experience, namely the extent to which basic psychological needs are satisfied in each context. In addition to the amount of need satisfaction in each context, we expect that an imbalance in the extent to which basic psychological needs are met across contexts can have important consequences for adolescent adjustment.

Self-determination Theory and Psychological Need satisfaction

Self-determination theory (SDT; Deci & Ryan, 2000, 2008) uses the concept of innate, universal, psychological needs to understand human motivation and development. Unlike other theories which consider needs to be individual differences, where people might experience different levels of a need such as a need for achievement or for power, self-determination theory views needs as nutrients that are universally required for psychological health (Deci & Ryan, 2008). The main question posed by SDT concerns not the amount of a need, but the degree to which each need is satisfied for each individual. Three psychological needs are considered to be essential: the needs for autonomy, competence, and relatedness. Autonomy refers to the experience of choice and personal endorsement of one’s activities and actions. Competence refers to feelings of mastery over one’s environment and the ability to bring about desired
outcomes. Finally, relatedness reflects feelings of closeness and connection with significant others. According to SDT, the key to healthy development and adaptation in a given context is the amount of psychological need satisfaction one experiences in that context (Deci & Ryan, 2000).

Many studies have assessed need satisfaction in a given context, relating it to outcomes in that particular context. These contexts include school (Filak & Sheldon, 2003), sports (Perreault, Gaudreau, Lapointe, & Lacroix, 2007; Reinboth & Duda, 2006), work (Baard, Deci, & Ryan, 2004; Deci et al, 2001), leisure (Ryan, Rigby, & Przybylski, 2006), and with significant others (Deci, LaGuardia, Moller, Scheiner, & Ryan, 2006; Patrick, Knee, Canevello, & Lonsbary, 2007). However, another central tenet of SDT is that optimal functioning requires that all three needs be fulfilled overall, or in all important life contexts, as any social environment that thwarts needs is thought to lead to negative effects on well-being outcomes (Deci & Ryan, 2008). Many researchers have tested this proposition by assessing need satisfaction ‘in general’, and relating this to various well-being outcomes (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). However, few studies have attempted to examine need satisfaction simultaneously in multiple contexts. One such study assessed need satisfaction with diverse relational partners (i.e., parents, roommate, best friend, etc.; La Guardia, Ryan, Couchman, & Deci, 2000), showing that need satisfaction experienced in each relationship predicted security of attachment in that relationship. Another study found that need satisfaction in different contexts differentially predicted various aspects of concurrent and future well-being (Véronneau, Koestner, & Abela,
Although these studies highlight the importance of examining need satisfaction in multiple contexts, they have not examined the questions of whether the balance of need satisfaction across diverse contexts has an impact on psychological adjustment and optimal functioning.

**Social Contexts in Adolescence**

Adolescence is a period of change, with youth undergoing developmental, cognitive, emotional, and social transformations. A primary goal of adolescence is to figure out who one is and where one fits into society (Erikson, 1959). Adolescents explore various values, lifestyles, peer networks, and vocations, often taking on different roles and developing a variety of role-related selves across social contexts (Harter, Bresnick, Bouchey, & Whitesell, 1997). Indeed, many decades ago, Bronfenbrenner (1979) emphasized the importance of looking at multiple contexts when examining adolescent development. The feedback and support adolescents receive in each context will often be a key determinant of whether this life stage is successfully resolved (La Guardia & Ryan, 2002).

The importance of social contexts in adolescence is highlighted by self-determination theory, with many studies showing that contexts which support autonomy, competence and relatedness lead to greater well-being and better outcomes among adolescents. For example, teachers’ autonomy support was shown to predict higher students’ grades (Black & Deci, 2000), while students who perceive their school environment to be supportive of their autonomy and competence were found to be less likely to consider dropping out of high school (Vallerand, Fortier, & Guay, 1997). Similarly, parental autonomy support was
shown to lead to greater academic motivation and well-being in a sample of
Russian and American high school students (Chirkov & Ryan, 2001), as well as to
higher levels of adjustment in school, in social competence, and in job-seeking
behaviours (Soenens & Vansteenkiste, 2005). Additionally, both parental
autonomy support and relational support were shown to be conducive to greater
well-being and more autonomous reasons for going to college (Niemiec et al,
2006). These findings were also replicated in the context of sports, with
adolescents’ perception of their coaches’ autonomy support (Gagne, Ryan, &
Bargmann, 2003) and coaches’ focus on mastery and improvement (Reinboth,
Duda, & Ntoumanis, 2004) related to adolescents’ well-being and motivation for
the sport.

Although numerous studies have examined the outcomes of autonomy-
supportive environments for adolescents, very few studies have considered the
other needs or directly examined need satisfaction in this age group. One study
that did so (Véronneau et al., 2005) examined the link between satisfaction of the
three basic needs in third and seventh graders, and well-being measures of affect
and depressive symptoms assessed concurrently with need satisfaction, as well as
6 weeks later. Unlike adult need satisfaction scales that either assess need
satisfaction in a general manner (e.g., Reis et al., 2000; Sheldon & Niemiec,
2006), or in one specific context (e.g., sports, Vlachopoulos & Michailidou, 2006;
work, Baard et al., 2004), the adolescent scale created by Véronneau and her
colleagues (2005) measures need satisfaction in three different contexts, namely at
school, at home, and with friends. These contexts were selected because previous
research indicated they were ranked among the most important by young people (Blais, Vallerand, Briere, Gagnon, & Pelletier, 1990). Véronneau and colleagues (2005) found that need satisfaction in each of the contexts differentially predicted various aspects of concurrent or future well-being. However, the analyses combined both the children and the adolescent data, precluding any conclusions about need satisfaction in adolescents alone, and did not examine the consequences of an imbalance between these three contexts.

**Balance of Need Satisfaction**

Recently, a novel approach was taken by Sheldon and Niemiec (2006), who examined the balance in the amount of satisfaction of the three basic psychological needs of autonomy, competence, and relatedness. Based on previous research in the domains of personal variability and work/life balance, they hypothesized that individuals who experience a balanced level of satisfaction in all three needs would exhibit greater psychological health than those who experience the same total amount of need satisfaction distributed in an imbalanced manner. In a series of four studies testing this proposition, university students’ balance in need satisfaction was found to affect concurrent subjective well-being and happiness as well as prospective well-being even when level of satisfaction of each individual need was controlled.

In their studies, Sheldon and Niemiec assessed either general need satisfaction in participants’ lives, or satisfaction in a single specific context (e.g., ‘with my mother’; Study 4), without distinguishing the potential differences in need satisfaction that individuals may experience across various contexts in their
life. We propose that an individual can experience an imbalance in the amount of need satisfaction in various life domains, such as a teenager who finds school interesting and likes her teacher, but belongs to a group of teens where she feels pressured to perform certain behaviours in order to fit in. We expect that variability across contexts occurs more often that variability across needs, and as such could be an especially important contributor to well-being and adjustment. Specifically, as need satisfaction is a function of environment support (Deci & Ryan, 2008), it would appear more likely that such support would vary across different contexts than across types of needs. Previous research has found that autonomy-supportive environments predict satisfaction of all three needs in that context, not of only one need in particular (Sheldon & Krieger, 2007). There is also evidence that satisfaction of the needs for autonomy, relatedness, and competence in a specific context tend to be highly correlated (Véronneau et al., 2005). It is thus somewhat difficult to imagine how across all of a person’s varied contexts, one need would be consistently less satisfied than another. By contrast it is easier to think of circumstances where an individual’s needs are satisfied in one context (e.g., at school) but not in others (e.g., home or work). We thus believe that aggregating the three needs in each important life domain, and examining the difference in need satisfaction across important life contexts could provide an important insight on the role of need satisfaction in each context as well as the impact of balanced need satisfaction across contexts.

Previous research in various domains of social psychology has emphasized the importance of consistency for psychological functioning. A large
variability in self-esteem (Kernis, 2005), personality patterns (Sheldon, Ryan, Rawsthorne, & Ilardi, 1997), and attachment security (La Guardia et al, 2000) have all been found to be negatively related to numerous well-being variables. That is, research suggests that over and above the effect of an individual’s level of self-esteem or attachment security, the extent to which the individual shows consistency across either time or situations will independently, and positively, relate to well-being outcomes. We expect that a consistency, or balance, of need satisfaction across important domains in adolescence will similarly be beneficial for adolescent adjustment.

Present Studies

In the present investigation, we sought to address the aforementioned questions regarding need satisfaction in various life contexts and the balance of need satisfaction across those contexts. In a series of three studies, we examined a variety of contexts important in adolescence, exploring need satisfaction at school, at home, with friends, and in part-time jobs. We also used a diverse number of adjustment indicators, including well-being, school dropout intentions, and teacher-rated adjustment. In all our studies, satisfaction of the three needs was aggregated by context for ease of comparison between contexts. Our research had two goals – firstly, to shed light on the importance of need satisfaction in various domains in adolescence, and secondly, to determine whether balanced need satisfaction across contexts is beneficial for adolescents’ well-being and adjustment independently of the additive effects of need satisfaction in each context. Our central hypothesis was that the balance of adolescents’ need
satisfaction across domains would predict well-being and adjustment over and above the main effects of the levels of need satisfaction in each individual domain.

**Study 1**

In Study 1 we assessed adolescents’ need satisfaction with friends, at home and at school, and examined how need satisfaction in these contexts and the balance among the contexts relate to well-being and school adjustment. Thus far, the only study that examined need satisfaction in different contexts in adolescents (Véronneau et al., 2005) found that need satisfaction at home and at school, but not with friends, was related to well-being. However, in that study, the analyses were performed on the aggregated data of both children and adolescents. As friends and peer groups exert greater influence in adolescence than in childhood, it is possible that need satisfaction with friends does in fact play an important role in this life stage. Our first goal for this study was thus to revisit Véronneau et al’s (2005) analysis of need satisfaction across contexts in adolescents. We hypothesized that need satisfaction in each context would be positively related to well-being. Our second hypothesis was that the balance of need satisfaction across contexts would also be positively related to well-being, independently of the total need satisfaction in each individual context.

In addition to assessing general well-being, we were interested in the effects of need satisfaction on school adjustment. As previous studies have shown that autonomy supportive parents and teachers can influence school outcomes (e.g., Guay, Ratelle, & Chanal, 2008), we hypothesized that satisfaction of the
basic needs at school and at home, but not with friends, would be related to school adjustment. We also predicted that balanced need satisfaction among the various life contexts would have a positive impact on school adjustment, as reported both by the participants themselves and by their teachers.

To obtain a more varied sample, we recruited participants from three different countries (Canada, the United States, and France). Additional analyses controlling for country effects were performed to ensure that balance across contexts was related to adjustment across the various populations. Finally, as we expected the role of balance across contexts to differ from that of balance across needs, we performed additional analyses to verify that balance across contexts would have effects that were independent of those obtained for Sheldon and Niemiec (2006)’s balance across needs measure.

Method

Participants and procedure. We used data collected as part of a cross-cultural study on over-scheduling and well-being (Gingras, 2007). Participants were 720 adolescents (52.1% female) ages 11-18 (mean age 14.5 years old) from three western countries, along with a sample of teachers (N = 264) who completed questionnaires about their students. With permission from the principals, students were recruited from two high schools in California, USA (44.6%), two high schools in Quebec, Canada (34.2%), and two high schools in France (21.3%) for a study of extracurricular and school activities and well-being. In each school, students completed questionnaires during an allotted time during the school day,
and teachers were asked to complete a brief questionnaire evaluating each of their students.

**Measures.** Although students completed a number of questionnaires, only those relevant to the present study will be described here.

**Well-being.** Participants completed a nine-item scale of affect (Emmons, 1992) which included 4 positive (e.g., joyful) and 5 negative (e.g., frustrated) items. Participants rated each item based on how much they have felt that way over the past several days on a scale of 1 (*very slightly or not at all*) to 5 (*extremely*). The scales have excellent temporal reliability and internal consistency (Diener & Emmons, 1984). As a further measure of well-being and adjustment, we measured participants’ positive self-concept (Anderman, 2002) using 6 statements (e.g., “I like myself just the way I am”) rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability for each measure was $\alpha = .87$ for positive affect, $\alpha = .75$ for negative affect, and $\alpha = .83$ for self-concept. As these three scales were correlated ($r = .37$ to .47, all $ps < .001$), a composite measure of well-being was created by taking a mean of the standardized scores for each scale.

**Need satisfaction.** We assessed need satisfaction using the Children’s Intrinsic Need Satisfaction scale (Véronneau et al, 2005). This scale consists of 18 items which assess adolescents’ autonomy, competence, and relatedness across three contexts - at home (e.g., “I feel I have a choice about when and how to do my household chores”), at school (e.g., “My teachers like me and care about me”), and with friends (e.g., “I feel my friends think that I am good at things”).
Three 6-item subscales were created assessing need satisfaction for each context. Responses were made on a 5-point scale, ranging from 1 (not at all true) to 5 (very true). The reliability for each context subscale was as follows: at home $\alpha = .74$, at school $\alpha = .73$, with friends $\alpha = .80$.

We followed the procedure used by Sheldon and Niemiec (2006) to compute a measure of need balance, using the subscales of need satisfaction in the different contexts instead of the satisfaction of the individual needs. The measure of need balance was thus computed by summing the absolute value of the difference between each pair of contexts, and then reversing it so that higher scores reflect greater balance. This was done by subtracting each participant’s score from the highest observed score, which in this sample was 6.33.

**Dropout intentions.** Dropout intentions were assessed using three items rated on a scale of 1 (strongly disagree) to 5 (strongly agree). The items were “I am thinking of quitting school,” “I sometimes think about quitting school,” and “Every year, I wonder if I will continue my studies.” The first two items were taken from a previous study of dropout intentions (Vallerand et al., 1997), and the third item was added to increase the scale reliability. Previous research (Vallerand et al., 1997) has shown that dropout intentions are significantly related to actual instances of drop-out. The reliability of the three-item scale was $\alpha = .77$.

**Teachers’ ratings of adjustment.** Teachers evaluated each child on 4 items measuring the child’s levels of optimism (adapted from and Scheier & Carver’s 1985) (e.g., “This child usually expects to have a good day”), and on 4 items assessing the child’s self-efficacy (adapted from Schwarzer & Jerusalem,
1995) using a 1 (*not at all true*) to 5 (*completely true*) scale. As these two measures were highly correlated ($r = .86, p < .001$), we combined all the items to create a measure of teacher-rated school adjustment, $\alpha = .96$.

**Results**

**Preliminary Analyses.**

We first examined whether demographic variables were related to any of our variables of interest. As both age and gender were significantly correlated with some of our dependent variables, we controlled for them in all subsequent analyses. Table 1 presents the means, standard deviations, and intercorrelations of the measures of age and gender, need satisfaction in each of the three contexts, balance of need satisfaction across contexts, and the measures of adjustment. Need satisfaction in each of the three contexts was correlated with well-being, and both need satisfaction at school and at home were related to drop-out intentions and teacher ratings of adjustment. We also found that there were significant differences in reported levels of need satisfaction across contexts ($F(2,718) = 412.29, p < .001$), with adolescents reporting highest need satisfaction with friends and lowest need satisfaction in school.

**Primary analyses.**

To test the relation of need satisfaction in important life contexts and of balance across contexts to well-being, a hierarchical multiple regression was performed on the composite measure of well-being. Age and gender were entered in Step 1 of the regression. Next we entered need satisfaction in each of the three contexts, and then balance of needs across contexts was entered in Step 3. Table 2
presents the standardized regression coefficients (betas), t-statistics, and significance levels for each of the predictors. Both age and gender were found to be significantly related to well-being, with older children and girls experiencing lower levels of well-being. Need satisfaction in each context was found to be significantly positively related to well-being, $\beta = .24$ for need satisfaction in school, $\beta = .31$ for need satisfaction at home, and $\beta = .23$ for need satisfaction with friends ($p < .001$ for all three contexts). The second step of the regression model accounted for a significant change of explained variance, $\Delta R^2$ of .37, $F(3, 712) = 142.99, p < .001$. Additionally need balance across contexts was a significant positive predictor of well-being above each individual need, $\beta = .16, p < .001$; $\Delta R^2 = .011, F(1, 711) = 13.07, p < .001$.

To examine the effect of balance across contexts on school adjustment, we performed the same hierarchical multiple regressions on the two variables of school adjustment: dropout intentions$^3$, and teacher ratings of adjustment. Age and gender were entered in the first step of the regression as control variables. We then entered need satisfaction in each of the three contexts in the next step, and then the balance of need satisfaction across contexts was entered in Step 3 (see Table 2 for a summary of the results). Results showed that need satisfaction in school was the strongest of the three contexts in predicting both measures of school adjustment, while need satisfaction at home was a significant predictor of dropout intentions only. An unexpected finding was that need satisfaction with friends was negatively related to school adjustment. Higher need satisfaction with friends significantly predicted higher dropout intentions and was a marginal
negative predictor of teacher ratings of adjustment. As expected, balance of need satisfaction across contexts was a significant negative predictor of dropout intentions ($\Delta R^2 = .01, p < .05$) and positive predictor of teacher rated adjustment ($\Delta R^2 = .02, p < .05$).

**Additional Analyses.**

Two additional sets of analyses were performed to test the robustness of our findings. To ensure that the effect of balance across contexts is not redundant with the effect of balance across the various needs, we computed a measure of balance across needs in the same way as Sheldon and Niemiec (2006). The two measures of balance were only modestly correlated, $r = .16, p < .001$. We then repeated the regressions but included balance across needs in step 2 along with need satisfaction in each context, and then balance across contexts in step 3. Balance across needs was not significant for any of the dependent variables, $\beta$s $\leq .05$. Balance across contexts remained a significant predictor for well-being ($\beta = .16$), dropout intentions ($\beta = -.12$), and teacher-rated adjustment ($\beta = .18$) after balance across needs was taken into account, $p$’s $< .05$. This supports our assumption that balance of need satisfaction across contexts is a separate construct from balance of the needs themselves.

We also tested for possible country effects to ensure that balance across contexts had a positive relation to adjustment in all three countries assessed in this study. As there were differences in need satisfaction across the three countries$^4$, we examined possible interactions between need satisfaction and participants’ country. The three country categories were dummy coded into two variables and
entered in the first step of the regression to control for the variance due to country effects (as recommended by Cohen and Cohen, 1983). The interaction between each of the two dummy coded country variables and need satisfaction in each context and need balance were entered in the fourth step of the regression. This step was not significant for wellbeing ($\Delta F (8, 701) = 1.51, ns$), drop-out intentions ($\Delta F (8, 694) = 1.41, ns$), or teacher-rated adjustment ($\Delta F (8, 246) = 1.33, ns$). As none of the country interactions explained any additional variance in our dependent measures, this suggests that balance of need satisfaction across contexts serves a similar role across countries.

**Brief Discussion**

This study provided initial support for our “balance across contexts” hypothesis, as well as revealing some interesting effects of need satisfaction in each context for a number of different dependent variables. As expected, need satisfaction in each of three different contexts was positively related to well-being. While Véronneau and colleagues (2005) found need satisfaction with friends to be unrelated to well-being in children, this difference in results is most likely due to the age difference in the samples, as Véronneau and her colleagues surveyed much younger children. As friends gain greater prominence in adolescents’ lives, need satisfaction experienced with one’s peers becomes increasingly important.

An interesting finding that emerged in this study was the negative relation between need satisfaction with friends and school adjustment (although it was only significant for dropout intentions and marginal for teacher ratings of
adjustment). This suggests that students whose needs for autonomy, competence, and relatedness are satisfied with their friends are more likely to report wanting to drop out of school, and were rated as somewhat less adjusted by their teachers. As we had no information on students’ peer groups, we were unable to examine the reasons for this negative association. However, we would expect that it stems from differences in the values held by adolescents’ friends. If adolescents are part of a peer group that does not value education, and they experience high need satisfaction in that peer group, this norm of educational disengagement can become internalized and negatively affect school outcomes.

Most importantly, we found support for our hypothesis related to balance across contexts, showing that adolescents who experienced balance of need satisfaction in important life contexts reported greater well-being, lower drop-out intentions, and were rated as better adjusted by their teachers. This relation was not reducible to the main effects of need satisfaction in each context, and persisted when we controlled for balance across needs and for country effects.

**Study 2**

In study 1, we showed that variability in need satisfaction across life contexts was negatively associated with adolescents’ well-being and adjustment as rated by teachers, and positively associated with dropout intentions in three western countries. In study 2, we sought to replicate these findings and extend them to an eastern culture. Research in self-determination theory has supported the proposition that despite differences in reported mean levels, the importance of need satisfaction of autonomy, competence and relatedness for psychological
well-being is universal across cultures (e.g., Chirkov, Ryan, & Willness, 2005; Sheldon, Elliot, Kim, & Kasser, 2001). Likewise, we expected that although Chinese adolescents might report different levels of needs satisfaction than Western adolescents in important life contexts, the function of these contexts and of the balance between contexts on adjustment would be similar. As in study 1, we hypothesized that need satisfaction in each context would be related to well-being, and that need satisfaction at home and at school would be related to dropout intentions. Most importantly, we expected that balance of need satisfaction across contexts would be positively related to well-being and dropout intentions independently of the levels of need satisfaction in each individual context. As in study one, we also tested for balance across needs as a potential confound.

Method

Participants and Procedure. Three schools were recruited in Yinchuan, the capital of the Chinese province of Ningxia. The principals of the schools agreed to participate in the study and recruited classes in which the survey was administered. Five hundred and eighty one Chinese adolescents completed the survey (55.9% female). The mean age of the participants was 15.78 years, with ages ranging from 12 to 18. In each school, students completed questionnaires during an allotted time during the school day.

Measures. Participants completed the same set of measures as in study 1. The questionnaires were translated from English to Mandarin by a translator in Montreal, and then verified again in China to ensure adherence to the regional dialect.
**Well-being.** As in Study 1, a composite measure of well-being was created using the standardized scores of positive affect, negative affect, and self-concept.

**Need satisfaction.** As in study 1, need satisfaction was assessed at home, at school, and with friends using the Children’s Intrinsic Need Satisfaction scale (Véronneau et al., 2005). The reliability for each context subscale was as follows: at home $\alpha = .74$, at school $\alpha = .73$, with friends $\alpha = .79$. A measure of need balance across contexts was then computed by summing the absolute value of the difference between each pair of contexts, and then reversing this measure by subtracting each participants’ score from the highest observed score, which in this sample was 7.33.

**Dropout intentions.** Adolescents’ dropout intentions were measured with the same three items as in study 1. The reliability of the scale was $\alpha = .80$.

**Results and Discussion**

**Preliminary analyses.**

Table 3 presents the means, standard deviations, and intercorrelations of the measures of age and gender, need satisfaction in each of the three contexts, balance of need satisfaction across contexts, and well-being. As in study 1, need satisfaction in each context was significantly positively correlated with well-being and with each other. Need balance across contexts was positively correlated with well-being and positively correlated with need satisfaction at school and at home, but negatively correlated with need satisfaction with friends. As in study 1, we found that there were significant differences in reported levels of need satisfaction.
across contexts \((F(2,579) = 201.28, p < .001)\), with adolescents reporting highest need satisfaction with friends and lowest need satisfaction in school.

**Primary Analyses.**

As in study 1, we performed two hierarchical multiple regressions, using well-being and dropout intentions as the dependent variables, to test our hypotheses. Age and gender were entered in the first step of the regression as control variables. We then entered need satisfaction in each of the three contexts in the next step, and then the balance of need satisfaction across contexts was entered in Step 3. Table 4 presents the standardized regression coefficients (betas), t-tests, and significance levels for each of the predictors. Need satisfaction in each context was found to be significantly related to well-being, \(\beta = .22\) for need satisfaction in school, \(\beta = .26\) for need satisfaction at home, and \(\beta = .08\) for need satisfaction with friends \((p < .05\) for all three contexts). The second step of the regression model accounted for change of explained variance, \(\Delta R^2 = .20, F(3, 569) = 49.69, p < .001\). In the third step, need balance across life contexts was a significant positive predictor of well-being, \(\beta = .15, p = .005; \Delta R^2 = .01, F(1, 568) = 7.78, p = .005\). Chinese teenagers who experienced greater need balance across contexts reported significantly higher well-being.

The same regression was then performed with dropout intentions as the dependent variable. Need satisfaction at home and at school was negatively related to dropout intentions \((\beta = -.14, p < .005\) for both), while need satisfaction with friends was unrelated. The second step of the regression model accounted for a significant change of explained variance, \(\Delta R^2 = .05, F(3, 567) = 10.28, p < .001\).
Additionally, the balance of need satisfaction across contexts was a marginally significant negative predictor of dropout intentions, $\beta = -.10, p = .07$, with students who reported greater balance reporting fewer intentions to quit school.

**Additional analyses.**

To ensure that the effect of balance across contexts is not redundant with the effect of balance across the various needs, we again computed a measure of balance across needs. The two measures of balance were only modestly positively correlated, $r = .09, p < .05$. We then repeated the regressions but included balance across needs in step 2 along with need satisfaction in each context, and then balance across contexts in step 3. Balance across needs was a marginal predictor of well-being in step 2 ($\beta = .07, p = .06$), becoming non-significant once balance across contexts was entered in step 3. Balance across needs was also not significant for drop-out intentions, $\beta = .06, p > .15$. Balance across contexts remained a significant positive predictor for well-being ($\beta = .14, p < .01$) and a marginal negative predictor of drop-out intentions ($\beta = -.10, p < .10$) after balance across needs was taken into account.

**Brief Discussion.**

This second study replicated the main results of our first study in a very different culture. While need satisfaction in each of the three contexts predicted psychological well-being, the balance of need satisfaction across contexts played an additional role, relating to well-being independently of the need satisfaction in each context. Similar results were found for dropout intentions; although the results for balance across contexts were only marginally significant, they were in
the expected direction. This suggests that the importance of balance across contexts is not simply a western phenomenon but, like the satisfaction of the needs for autonomy, competence, and relatedness, universal across cultures.

One area in which the results of the Chinese sample differed from the western sample was in the role of need satisfaction with friends in both well-being and drop-out intentions. While need satisfaction with friends was a strong predictor of well-being in the western sample, it played a much smaller (though still significant) role in the Chinese sample. Additionally, while in western countries need satisfaction with friends appeared to exert a negative influence by contributing to higher drop-out intentions, no such relation was found in the Chinese sample.

**Study 3**

To extend the results of the first two studies, we examined need satisfaction in a different context, namely at work. Similarly to school, work is a performance-based context, and as such is a different environment from home and friends which are more relationally-based. Part-time employment is common among adolescents, with recent surveys showing that 31% of American high school students engage in a part time job (U.S. Bureau of Labor Statistics, 2006). Part-time employment represents an arena of independence outside of home and school in which adolescents gain social competencies and material rewards for an independent life with peers (Dryfoos, 1998). While many parents feel that part-time employment is beneficial for their adolescent children (Aronson, Mortimer, Zierman, & Hacker, 1996), some research has also found that working long hours
appears to be negatively associated with school outcomes such as performance and positively associated with dropout intentions (e.g., Stern & Briggs, 2001). Studies assessing the quality of high school students’ part-time work experiences found that adolescents who reported more compatibility between school and work experienced lower depressive affect, as did those who felt that work did not have a negative impact on their grades (Mortimer, Harley, & Staff, 2002).

In this study, we address the issues of the quality of work experiences and the compatibility of school and work from a self-determination theory perspective. While previous studies have explored a number of different factors that can influence the impact of work on school outcomes, no research has examined the effects of psychological need satisfaction at work on school dropout intentions. We predict that need satisfaction at school, but not at work will be negatively related to dropout intentions, and, more importantly, that the balance of need satisfaction between these two contexts will predict lower drop-out intentions after controlling for need satisfaction in each context.

**Method**

**Participants and procedure.** Participants were 1068 high school students in grades 9 through 11 who reported working more than 10 hours per week (53.7% female, 11 did not report gender). Participants were recruited from 24 high schools across 5 school boards from the Laurentian area of Quebec, Canada. Data for the study was collected as part of an ongoing project on youth employment and school perseverance organized by the PREL (Partenaires pour la Réussite Educative dans les Laurentides), a non-profit organization in the
Laurentian region of Quebec whose mandate is to increase school success and perseverance among the youth in the region. A brief survey, which took no longer than 10 minutes to complete, was distributed at each high school by youth counsellors from the participating school boards. Students voluntarily completed the questionnaire and returned it to the youth counsellors. Due to survey length restrictions, this study did not include a measure of well-being.

**Measures.**

**GPA.** Participants were asked to report their grade point average for the current academic year. As the data collection took place in the last months of the school year, it provided an accurate assessment of students’ academic average for that year.

**Number of hours worked.** Students were asked to report the number of hours on average that they worked each week.

**Dropout intentions.** Adolescents’ dropout intentions were measured with the same three items as in study 1. The reliability of the scale was $\alpha = .79$.

**Need satisfaction.** Need satisfaction was assessed in the school and work contexts. Nine items adapted from the basic need satisfaction at work scale (Baard et al, 2004) were rated on a 5 point scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. For each question (e.g., “Most of the time I feel competent”), participants provided a response for both the academic and work settings. Need satisfaction in each context was computed by averaging the answers to the nine items in each setting. The reliability for the need satisfaction scales was $\alpha = .81$ at school, and $\alpha = .84$ at work.
The divergence of need satisfaction between the two contexts was computed by calculating the absolute value of the difference in need satisfaction between the two contexts. A measure of balance between contexts was computed by subtracting each participant’s divergence score from the highest observed score, which in this sample was 3.

**Results and Discussion**

**Preliminary results.**

Table 5 presents the means, standard deviations, and intercorrelations of our study variables. Female students reported higher grades and lower dropout intentions than males. As expected, need satisfaction in school and at work were significantly positively correlated with each other as well as with the balance of need satisfaction across contexts. Dropout intentions were significantly negatively correlated with need satisfaction in each context as well as with balance across contexts. Participants experienced similar levels of need satisfaction at school and at work, \( t = 1.30, \text{ns} \).

**Primary analyses.**

A hierarchical multiple regression was performed on dropout intentions. Gender, GPA, and average hours worked were entered in the first step of the regression as control variables. We then entered need satisfaction at school and at work in the next step, and then the balance of need satisfaction across contexts was entered in Step 3. Table 6 presents the standardized regression coefficients (betas), t-tests, and significance levels for each of the predictors. In the first step, hours worked and grade point average were significant predictors of dropout...
intentions, $\beta = .11$ and $\beta = -.20$ respectively ($ps < .01$). Only need satisfaction at school and not at work was a significant negative predictor of dropout intentions in the second step of the regression, $\beta = -.22$, $p < .001$. The second step of the regression model accounted for a significant change of explained variance, $\Delta R^2 = .05$, $F(2, 819) = 21.53$, $p < .001$. Although need satisfaction at work was not a significant predictor of dropout intentions, the balance of need satisfaction between the school and work contexts was significant, $\beta = -.08$, $\Delta R^2 = .006$, $F(1, 818) = 5.83$, $p = .016$. That is, teenagers who were higher in school satisfaction and who also reported high need satisfaction at work were especially likely to report lower dropout intentions.

**Additional Analyses.**

To ensure that the effect of balance across contexts is not simply due to the effect of balance across the various needs, we again computed a measure of balance across the three needs (Sheldon & Niemiec, 2006). The two measures of balance were only modestly positively correlated, $r = .11$, $p < .001$. We then repeated the regressions but included balance across needs in step 2 along with need satisfaction in each context, and then balance across contexts in step 3. Balance across needs was not significant for dropout intentions, $\beta = -.02$. Balance across contexts remained a significant positive predictor for dropout intentions ($\beta = -.08$, $p < .02$) after balance across needs was taken into account.

**Brief Discussion.**

While our first two studies focused on academic, family, and peer settings, this study highlighted the importance of part time work as a significant setting in
adolescents’ lives. Research conducted thus far on adolescents’ part-time work suggests the possibility that work experiences can either interfere with or facilitate students’ school engagement. One might worry that students who felt highly autonomous, competent, and related in their work environment would perhaps invest more in this domain and decrease their engagement in the academic domain. Our results show that need satisfaction at work was not associated with school disengagement. Indeed, work need satisfaction was positively associated with school need satisfaction and unrelated to drop-out intentions. This is good news in that it suggests that the presence of need satisfaction in a teenager’s work environment does not pull them away from pursuing their academic goals.

Additionally, after controlling for school need satisfaction, the balance of need satisfaction across the work and school contexts was a significant predictor of lower dropout intentions. This suggests that while need satisfaction in a part-time job is not directly related to dropout intentions, students who experience high need satisfaction at school and also high satisfaction at work report lower intentions to abandon their education. This could indicate that there is something fundamental about a balance in two important domains that can boost confidence in future pursuits. As school is an avenue for a future entry into the workforce, experiencing high need satisfaction at work could further encourage future school commitment in those students who are already experiencing need satisfaction at school. Our results also support previous research on part-time jobs in adolescence, which has found that compatibility between school and work was related to lower depressive affect (Mortimer et al, 2002).
General Discussion

Self-determination theory has long recognized that the basic psychological needs of autonomy, competence, and relatedness are necessary for optimal functioning and for integration of social norms and values in every life context. (Deci & Ryan, 2000). Recently, Sheldon and Niemiec (2006) showed that the balance between these three needs independently affects well-being. Our studies build on these findings by examining the balance of need satisfaction across important life contexts. In three studies with over 2300 adolescents across four countries we found that the balance of need satisfaction across life contexts is significantly related to well-being as well as to school adjustment. Participants who experienced greater balance between important life domains reported being happier, were less likely to consider dropping out of high school, and were rated as better adjusted by their teachers.

While previous research (Sheldon & Niemiec, 2006) has examined the role of balance of need satisfaction across the three needs, we proposed that individuals can experience an imbalance in the amount of need satisfaction across various life domains. Based on evidence that need satisfaction is largely contextually determined (Deci & Ryan, 2008) and that levels of need satisfaction across the three needs tend to be highly correlated in a particular situation (Véronneau et al., 2005), we hypothesized that variability across contexts occurs more often than variability across needs, and as such should be an especially important contributor to well-being and adjustment. Our results indicated that the balance of need satisfaction across contexts was only modestly positively related
to Sheldon and Niemiec’s (2006) measure of balance across needs, and that balance across contexts was significantly associated with the outcome variables even after controlling for balance across needs. This supports our proposition that need satisfaction in important life domains is differentiated from the satisfaction of the three needs, and that a balance in need satisfaction across life domains is uniquely linked to well-being and adjustment.

In the most recent summary of their self-determination theory research, Deci and Ryan (2008) noted that the theory was developed to generate principles that can be applied to understand people’s phenomenological experience across life’s domains. The theory has generated a vast amount of research elaborating the importance of satisfying the needs for autonomy, competence, and relatedness in many applied domains. However, variations in need support across diverse contexts and their impact on adjustment and adaptation have only begun to be examined by SDT researchers (La Guardia et al., 2000; Veronneau et al., 2005). The results of the present study clearly suggest that contextual balance in the experience of autonomy, competence and relatedness may significantly impact young people’s well-being and pursuit of success. Specifically, our results indicate that need satisfaction in one context does not compensate for need satisfaction in other important contexts, providing further evidence for SDT’s assumption that the needs are nutrients that people need consistently throughout all aspects of their lives.

Having established the importance of balance in need satisfaction across contexts as contributing unique variance to youth’s adjustment, it is important to
consider specific mechanisms that may mediate this relationship. Two likely mediators are role conflict and lack of self-concept clarity (Campbell, 1990). Young people who experience marked need satisfaction discrepancies across the major settings in their life (home, work, friends, and school) may experience greater role conflict, which, in turn will impair their well-being and adaptation. It also seems possible that contextual need imbalances among adolescents may thwart the important developmental process of establishing a secure and resilient personal identity (McAdams, 2004) and of attaining a clear self-concept. Previous research on adolescent development has found that adolescents develop multiple self-representations across different roles and contexts (e.g., Harter et al, 1997). As adolescents develop the cognitive skills used to compare single abstractions, they begin to recognize the conflicts that opposing attributes (e.g., depressed with parents but happy with friends; Harter & Monsour, 1992) pose without yet being able to integrate them into one coherent self-theory, often resulting in distress as they attempt to reconcile these opposing identities (Harter et al, 1997). Self-determination theory explains that identities are “adopted in the service of basic psychological needs” (Ryan & Deci, 2002, p.254); thus those identities in which the needs are satisfied will be more internalized and assimilated into the self. An imbalance of need satisfaction across contexts could lead to the internalization of some identities as genuine, and the enactment of other roles for external or introjected reasons. This should be especially problematic for adolescents, who are unable to reconcile the conflict caused by the often opposing identities, leading to an unclear self-concept. As high self-concept clarity has previously
been linked to greater well-being and psychological health (Campbell et al., 1996), it could be considered as a potential mediator of the need balance across contexts to wellbeing path; future research is needed to test this proposition.

In addition to being implicated in role conflict in adolescents, variability of need satisfaction across contexts can potentially provide an alternative explanation for the negative effects resulting from work-family imbalance found by research in organizational psychology (e.g., Ford et al., 2007, Greenblatt, 2002). While this literature has focused on stress, time-based pressures, and role conflict as responsible for the imbalance and the ensuing negative effects, our research suggests that psychological needs could offer an alternative explanation. The thwarting of the needs for autonomy, competence and relatedness either at work or in the family would create an imbalance of need satisfaction across contexts, which we have shown to be related to diminished well-being. This argument is indirectly supported by a study which examined work-family conflict from a self-determination theory perspective (Senecal, Vallerand, & Guay, 2001). The study found that feeling valued by one’s partner and feeling that one’s autonomy is supported by one’s employer predicted autonomous motivation for family and for work respectively, both of which then predicted lower levels of family alienation, work-family conflict, and emotional exhaustion. Additionally, the study demonstrated the importance of reciprocal effects between personal domains, as negative interpersonal factors both at home and at work influenced (through motivation) alienation and exhaustion. This provides further theoretical
support for our current findings pertaining to the importance of balance across contexts.

Although our studies examined need balance across a number of different contexts, these contexts are by no means exhaustive of what is important in adolescents' lives. Contexts such as sports, extracurricular activities, and even relationships with other significant adults could also provide need satisfaction and play an important role in children’s lives. Future studies should assess need satisfaction in the contexts which adolescents consider as most important. Future studies should also prospectively test the impact of need balance across contexts, and should examine other populations such as children and adults to ensure that the importance of balance across contexts holds true across development.

Another important direction for future research is to examine the mechanisms through which need satisfaction in important contexts and context balance are related to adjustment. According to self-determination theory, autonomy, competence, and relatedness in a given context are important ingredients for promoting the integration of social norms and values of that context (Deci & Ryan, 2000). Our findings, which show that students who experience need satisfaction at school report lower dropout intentions, suggest that these students have internalized the value of school. In addition, our research suggests that other contexts which support these norms and values play an additional role in their internalization. The value of school persistence would presumably be imparted to the adolescents by their parents as well as their teachers, which is reflected in the influence need satisfaction at home has on
dropout intentions. Experiencing need satisfaction across a number of contexts which impart similar values allows for greater integration of the values, in this case the importance of school. Future research should explicitly test these links, identifying how integration of social norms and values operates across contexts. It would also be important in future research to examine the role of need satisfaction in situations where norms or values conflict across contexts – for example, when teachers promote the importance of education, but one’s peer group holds a different set of values.

In conclusion, the present investigation is unique in its exploration of adolescents’ need satisfaction across life contexts and how this relates to well-being and school outcomes. Our results demonstrated that not only is it important for teens to experience high levels of need satisfaction in contexts such as home, school, friends and work, but that the balance of need satisfaction across such contexts also plays a critical role. Moreover, our study suggested that the importance of teenagers’ balance of need satisfaction across contexts appears to hold true across very different cultures as well as across different outcomes.
References


Footnotes

1 In their article, Sheldon & Niemiec (2006) illustrate the importance of balance across needs by providing an example of a businessman who owns a successful business and is experiencing high levels of competence and autonomy at work (a score of 6 on a scale of 1 to 7), but does not have enough time to spend with his family, and thus has a low satisfaction of the need for relatedness (a score of 3). However, a closer examination of this example reveals that this entrepreneur can be conceptualized as experiencing an imbalance in need satisfaction across contexts (high need satisfaction at work, low need satisfaction with family) rather than across needs per se.

2 To create Sheldon and Niemiec (2006)’ measure of need balance, three 6-item subscales are created to assess satisfaction of each need instead of need satisfaction for each context.

3 The results were essentially unchanged when a log transformation was applied to the drop-out variable to control for skewness and kurtosis.

4 Participants from France experienced significantly lower need satisfaction at school and lower balance than participants from Canada and the US.

5 The results were essentially unchanged when a log transformation was applied to the drop-out variable to control for skewness and kurtosis.

6 We included GPA and number of hours worked as controls in this study because previous work with this data (Gagnon, 2007) found these variables to be strongly related to drop-out intentions.
The results were essentially unchanged when a log transformation was applied to the drop-out variable to control for skewness and kurtosis.

We replicated this effect through a different analysis – in the third step of the regression, instead of including balance across contexts, we included an interaction product of need at school * need at work, which was highly significant ($\beta = .08, p < .05$). This interaction shows that the relationship between need satisfaction at school and dropout intentions is qualified by need satisfaction at work, such that students high in school need satisfaction are particularly unlikely to drop out of school when they also experience high need satisfaction at work.
Table 1

Means, Standard Deviations, and Intercorrelations of Study Variables: Study 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td>14.47</td>
<td>1.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs in Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Home</td>
<td>3.85</td>
<td>.71</td>
<td>-.06</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. School</td>
<td>3.45</td>
<td>.72</td>
<td>-.11</td>
<td>.03</td>
<td>52**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Friends</td>
<td>4.26</td>
<td>.61</td>
<td>-.02</td>
<td>.11*</td>
<td>32**</td>
<td>.35**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Context balance</td>
<td>4.11</td>
<td>1.22</td>
<td>-.09*</td>
<td>-.03</td>
<td>42**</td>
<td>.68**</td>
<td>-.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Well-being</td>
<td>.00</td>
<td>.78</td>
<td>-.10*</td>
<td>-.08*</td>
<td>51**</td>
<td>49**</td>
<td>41**</td>
<td>36**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Dropout intentions</td>
<td>1.29</td>
<td>.63</td>
<td>.08*</td>
<td>-.06</td>
<td>-.20**</td>
<td>-.24**</td>
<td>-.02</td>
<td>-.25**</td>
<td>-.16**</td>
<td></td>
</tr>
<tr>
<td>9. Teacher-rated</td>
<td>3.57</td>
<td>.95</td>
<td>-.22**</td>
<td>.30**</td>
<td>.14*</td>
<td>.25**</td>
<td>.03</td>
<td>.27**</td>
<td>.13*</td>
<td>-.15*</td>
</tr>
</tbody>
</table>

Note: The values for the gender variable are 1 = male, 2 = female. Means with different subscripts (a, b, c) are significantly different, $p < .001$. *$p < .05$, **$p < .001$. 
Table 2

*Standardized Regression Coefficients of Dependent Measures on Need Satisfaction across Contexts: Study 1*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Well-being</th>
<th>Dropout intentions</th>
<th>Teachers’ ratings of self-regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>Set 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆R² = .02, p &lt; .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.10</td>
<td>-2.76</td>
<td>.006</td>
</tr>
<tr>
<td>Gender</td>
<td>-.08</td>
<td>-2.14</td>
<td>.033</td>
</tr>
<tr>
<td>Set 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆R² = .37, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>.31</td>
<td>8.69</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>School</td>
<td>.24</td>
<td>6.87</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Friends</td>
<td>.24</td>
<td>7.36</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Set 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆R² = .01, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Context balance</td>
<td>.16</td>
<td>3.62</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>∆R² = .14, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(6, 711) = 78.23,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(6, 704) = 11.21,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² = .22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(6, 256) = 11.80,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p &lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The values for the gender variable are 1 = male, 2=female.
Table 3

*Means, Standard Deviations, and Intercorrelations of Study Variables: Study 2*

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td>15.78</td>
<td>1.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td>1.56</td>
<td>.50</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Needs in Context</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Home</td>
<td>3.24</td>
<td>.83</td>
<td>.05</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. School</td>
<td>3.05</td>
<td>.80</td>
<td>.05</td>
<td>-.02</td>
<td>.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Friends</td>
<td>3.77</td>
<td>.81</td>
<td>.02</td>
<td>.04</td>
<td>.29</td>
<td>.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Context balance</td>
<td>4.94</td>
<td>1.41</td>
<td>.09</td>
<td>-.08</td>
<td>.33</td>
<td>.32</td>
<td>-.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Well-being</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Well-being</td>
<td>.00</td>
<td>.82</td>
<td>-.05</td>
<td>-.14</td>
<td>.39</td>
<td>.38</td>
<td>.25</td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>8. Drop-out</td>
<td>1.76</td>
<td>.95</td>
<td>.24</td>
<td>-.00</td>
<td>-.18</td>
<td>-.17</td>
<td>-.05</td>
<td>-.14</td>
<td>-.21</td>
</tr>
</tbody>
</table>

Note: The values for the gender variable are 1 = male, 2 = female. Means with different subscripts (a, b, c) are significantly different, p < .001. *p < .05; **p < .005.
Table 4

*Standardized Regression Coefficients of Dependent Measures on Need Satisfaction across Contexts: Study 2*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Well-being</th>
<th>Dropout intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$t$</td>
</tr>
<tr>
<td>Set 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2 = .02, p &lt; .01$</td>
<td>$\Delta R^2 = .06, p &lt; .001$</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.05</td>
<td>-1.28</td>
</tr>
<tr>
<td>Gender</td>
<td>-.14</td>
<td>-3.37</td>
</tr>
<tr>
<td>Set 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2 = .20, p &lt; .001$</td>
<td>$\Delta R^2 = .05, p &lt; .001$</td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>.26</td>
<td>6.24</td>
</tr>
<tr>
<td>School</td>
<td>.22</td>
<td>4.79</td>
</tr>
<tr>
<td>Friends</td>
<td>.08</td>
<td>1.97</td>
</tr>
<tr>
<td>Set 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2 = .01, p &lt; .01$</td>
<td>$\Delta R^2 = .01, p = .07$</td>
<td></td>
</tr>
<tr>
<td>Context</td>
<td>.15</td>
<td>2.79</td>
</tr>
<tr>
<td>balance</td>
<td>$R^2 = .24,$</td>
<td>$R^2 = .11,$</td>
</tr>
<tr>
<td></td>
<td>$F(6, 568) = 29.18,$</td>
<td>$F(6, 566) = 11.64,$</td>
</tr>
<tr>
<td></td>
<td>$p &lt; .001$</td>
<td>$p &lt; .001$</td>
</tr>
</tbody>
</table>

Note: The values for the gender variable are 1 = male, 2 = female.
Table 5
*Ments, Standard Deviations, and Intercorrelations of Study Variables: Study 3*

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Hours worked</td>
<td>20.19</td>
<td>7.24</td>
<td>-.14**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. GPA</td>
<td>75.01</td>
<td>9.50</td>
<td>.14**</td>
<td>-.15**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs in Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. School</td>
<td>3.90</td>
<td>.62</td>
<td>.08*</td>
<td>-.06</td>
<td>.17**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Work</td>
<td>3.92</td>
<td>.66</td>
<td>.03</td>
<td>.04</td>
<td>.08*</td>
<td>.45**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>6. Context balance</td>
<td>2.55</td>
<td>.50</td>
<td>-.02</td>
<td>-.01</td>
<td>.03</td>
<td>.31**</td>
<td>.19**</td>
<td>--</td>
</tr>
<tr>
<td>7. Dropout intentions</td>
<td>1.57</td>
<td>.84</td>
<td>-.09*</td>
<td>.14**</td>
<td>-.22**</td>
<td>-.26**</td>
<td>-.11*</td>
<td>-.13**</td>
</tr>
</tbody>
</table>

Note: The values for the gender variable are 1 = male, 2 = female. *p < .05; **p < .001
Table 6

Standardized Regression Coefficients of Dropout Intentions on Need Satisfaction across Contexts: Study 3

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Set 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.05</td>
<td>-1.45</td>
<td>.146</td>
</tr>
<tr>
<td>Hours worked</td>
<td>.11</td>
<td>3.26</td>
<td>.001</td>
</tr>
<tr>
<td>GPA</td>
<td>-.20</td>
<td>-5.76</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Set 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>-.22</td>
<td>-5.73</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Work</td>
<td>-.01</td>
<td>-.14</td>
<td>.887</td>
</tr>
<tr>
<td><strong>Set 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Context balance</td>
<td>-.08</td>
<td>-2.41</td>
<td>.016</td>
</tr>
</tbody>
</table>

ΔR² = .06, p < .001

R² = .12, F(6, 818) = 18.40,

p < .001

Note: The values for the gender variable are 1 = male, 2 = female.
GENERAL DISCUSSION

Although self-determination theory has long recognized the importance of studying its central constructs across different levels of experience, most research on psychological need satisfaction has focused on general need satisfaction or need satisfaction in specific, isolated domains or situations. The present program of research aimed to rectify this problem by looking at the role of psychological need satisfaction in multiple domains simultaneously. The consequences of experiencing domain need satisfaction for motivational and well-being outcomes at different levels of generality, as well as the interplay among domains was investigated. Overall, the findings highlight the importance of examining psychological need satisfaction in multiple life domains.

In Article 1, need satisfaction in six different life domains was shown to play a similar role in the motivation for engaging in the domain, but to be differentially related to the well-being experienced in that domain. The studies in Article 2 focused on the role of need satisfaction in goal pursuit, showing that people set more self-concordant (autonomous) goals in domains where they experienced need satisfaction. Such goals are, in turn, more likely to be attained, which influences subsequent feelings of need satisfaction and well-being. The first two articles also revealed extensive within-person variability among need satisfaction reported in different life domains. Finally, the studies in Article 3 demonstrate the detrimental effects of such variability, showing that a balanced
profile of need satisfaction across important domains is positively related to both general and scholastic adjustment.¹

An important strength of the present program of research is the variety and multitude of samples and methods employed therein. Participants included undergraduate student samples as well as community adults and high school students across multiple countries. That the results of the studies hold up across such diverse samples strengthens the present findings and further points to the universality of the importance of need satisfaction proposed by self-determination theory. In addition to variability in participants, another important strength is the variety of methods employed in the present studies. Across the nine studies, questionnaire and experimental methods were used; the questionnaires including both self-report and reports of friends (Article 2, Study 4). Correlational studies were supplemented with prospective studies, some lasting a full semester (Article 2, Studies 3 and 4), as well as a daily-diary study (Article 2, Study 2). The diverse domains that were included in this study were elicited both ideographically, with participants naming important life domains which were then coded, and by asking participants about specific domains such as school or health. This variety of methods afforded the opportunity of taking advantage of multiple statistical methods to test the questions of interest, including structural equation modeling (Article 2, Study 4), and hierarchical linear modeling (Article 1; Article 2 Studies 2 and 4).

¹ Additional analyses of the data presented in the first article (chapter 2) showed that balance among domains was related to greater well-being (controlling for age, mean need satisfaction, and number of domains). Balance was not related to well-being indices in the data presented in studies 3 and 4 of the second article (chapter 3).
An additional benefit of the methodology employed in the present articles was that it afforded an examination of within-person variation in domain need satisfaction. Except for one prior paper (LaGuardia et al., 2000), research on self-determination theory has looked at need satisfaction at the between-person level. Such analyses do not preclude the possibility that some other external variable could influence reports of both need satisfaction and the outcomes assessed. Although many studies control for personality variables such as the Big 5 in their analyses (e.g., Phillipe, Koestner, Beaulieu-Pelletier, & Lecours, 2011), it is impossible to control for all possible aspects of personality. Using within-person analyses, as was done in many of the studies in the present thesis, tests the proposed effects of domain need satisfaction on important outcomes untainted by the effects of personality. Indeed, the large proportion of variance that is found within person (in the present studies, approximately 80% percent) suggests that person-level variables play a very small role in explaining the amount of need satisfaction experienced in a domain. The interesting question then becomes not who experiences more need satisfaction, but the areas of one’s life in which these need-satisfying experiences occur.

Implications for Self-Determination Theory, Outstanding Questions and Future Directions

The present collection of studies reinforces the importance of looking at numerous domains simultaneously. While self-determination theory posits that the basic psychological needs are universal, this has typically been tested by looking across cultures (e.g., Chirkov, Ryan, & Willness, 2005; Sheldon et al.,
or in multiple age groups (e.g., Kasser & Ryan, 1999; Véronneau et al., 2005). The research in this thesis additionally shows that this is true across a multitude of important life domains. While previous research on need satisfaction has been conducted in many life domains, such research did not directly compare the effects across these domains. The present research suggests that although the effects of need satisfaction on motivation are similar across domains, there are differences in the role that need satisfaction plays in other outcomes which are further downstream, such as well-being and goal-attainment. Future research can aim to better understand the reasons for such disparities, as well as examine specific features of a domain which could influence the magnitude of the effect of need satisfaction on these outcomes.

The results of the within-subject analyses which show that most of the variance is within rather than between-person also leads to a number of interesting research questions. Since there is so much variability in need satisfaction across important domains within a single person, it raises the question of how that person make judgments about their overall need satisfaction, which is so often assessed in self-determination theory research. Although research in other areas of psychology (well-being, personality) have tackled this question for other constructs, suggesting that global ratings are made up of lower-level (contextual or situational) judgments which are either more chronic or situationally activated (e.g., McConnell, 2011), this has generally not been examined in relation to need satisfaction. This oversight has recently begun to be addressed (Milyavskaya, Philippe & Koestner, 2013), with research showing that need satisfaction at the
general, domain-specific, and episodic levels of experience is organized in a heterarchical manner. This research provides evidence for both top-down and bottom-up effects of need satisfaction across three levels of experience, showing that domain need satisfaction contributes to predicting ratings of general need satisfaction. While this research shows that it is likely that general ratings are based on experiences of need satisfaction in important life domains, the question remains about whether all domains are equally considered in such general judgments or whether certain domains may be weighed more heavily. This weighting could be based on the importance of domain, the predominance of the domain in one’s life, or the salience of domain at the time of judgment. For example, research on the self-concept has shown that responses to items meant to assess general self-concept are tinted to reflect the domain if they are embedded in a domain-specific questionnaire (Marsh & Yeung, 1999). Ratings of general need satisfaction could similarly be based on whichever domain is presently activated in the responder’s mind. Additional research is needed to investigate this question.

A limitation of the studies in the present thesis is the use of subjective rather than objective ratings of psychological need satisfaction. Although in Article 2 two of the studies (2 and 5) were experimental in nature, the assignment to condition and the analyses still relied on subjective ratings of need satisfaction. It is unknown how people make such subjective ratings, and what objective environmental conditions must be present that allow people to experience need satisfaction. Research does show that certain features of the environment and of
the people therein increase experiences of need satisfaction. This includes an environment where others, particularly those in a position of authority, are responsive to a person’s needs and interests, take the person’s perspective, support a sense of choice, and provide structure (Deci & Ryan, 2008). However, there is reason to expect that perception of need satisfaction is not solely based on these environmental supports but is also dependent on a person’s “inner resources” (Deci & Ryan, 2000). Indeed, two students in the exact same classroom may perceive different levels of need satisfaction in that classroom based on their previous experiences, the amount of success they are experiencing in learning the material, and a multitude of other factors. This points to the importance of distinguishing between the amount of support objectively available in the environment, the support perceived to be available, and subsequently derived need satisfaction. Developing objective measures of environmental support for the three needs or experimentally manipulating such support and looking at the effects on self-ratings of need satisfaction can help answer these important questions. This can also be achieved by examining how different people experience the exact same settings to determine the factors that influence the likely interpersonal differences in perception of support and need satisfaction.

Another issue raised by the present research is whether domain need satisfaction actually influences how much a person invests in a given domain. Since people experience positive outcomes, including greater goal progress and greater well-being, when engaging in need-satisfying domains, it could be conceivable that people are more likely to invest more time and energy in
domains where the needs are satisfied in order to accrue more of these benefits. This, however, could lead to an even greater imbalance, which could be detrimental to some positive outcomes. Additionally, it is evident that people are often engaged in domains such as school or work despite the relatively lower need satisfaction they experience in these domains (compared to other domains such as friends or leisure). Although their motivation and well-being suffers in these domains, people nevertheless hold on to them, often imbuing them with equal or greater importance and investing more time in these domains (as could be seen in Article 2, Study 3). The question of why this occurs and how people shift the balance of resources into their different important life domains based on the need satisfaction experienced in these domains is an interesting one for future research to investigate.

In the present studies, overall need satisfaction was examined by combining the ratings of autonomy, competence, and relatedness. This was done for a number of reasons. First, although initial research testing the existence and importance of the needs considered the effects of each need separately, most of this research has found similar effects of these three needs on basic outcomes (e.g., Wei et al., 2005). This is not surprising, given that theoretically the three needs are considered to be universally important (Deci & Ryan, 2008), and that they are often highly correlated (e.g., Gagné, 2003). Other recent research which examines more complex questions about the role of these needs typically combines the three needs into one overall measure of need satisfaction (e.g., Patrick et al., 2007) or uses them as indicators of a latent construct (e.g., Niemiec
et al., 2009). Examining the role of individual needs would be further complicated by the fact that the needs are not independent of each other. Indeed, it is likely that it is the commonality among the needs, rather than the ‘residuals’ or what is unique about each need, that is responsible for the effects of need satisfaction on motivation and well-being. The common practice of including the three needs in a regular multiple regression analysis and interpreting the beta weights would thus provide biased estimates of the role of each need since some of the needs are ‘given credit’ for explained variance that is shared with the one or more of the other needs (Pedhazur, 1997; for a thorough discussion of the problem, see Nathans, Oswald, & Nimon, 2012). For these reasons, and to maintain the focus of the research on the general role of domains, the three needs were combined in all the present studies. However, it is nevertheless possible that some of the needs are more relevant in particular domains than in others. For example, competence may play a larger role in the work setting, while relatedness may be particularly important with one’s friends. In order to fully untangle the role of each need, future research can experimentally manipulate the availability of each of the three needs in a particular domain to examine their unique and shared impact in central life domains.

Conclusions

Overall, the present thesis shows that psychological need satisfaction experienced in all domains in one’s life contributes to both domain-specific and general motivation and adjustment. Although experiencing need satisfaction contributes to these outcomes in all domains, the scope of these effects is not the
same across all domains, suggesting that need satisfaction may be particularly important in some specific domains. Importantly, the amount of need satisfaction varies to a great extent within the various domains in which a person is involved, which explains why people exhibit qualitatively different motivation in some domains in their lives, and are more likely to be successful and happy when engaged in certain pursuits or activities. Although such variability is normal, too much variability can have negative consequences for adjustment and well-being. Understanding the role of need satisfaction and its variability across important life domains can be used to help people stay motivated, productive, and happy in important life domains, leading to an upward spiral of improved psychological well-being.
GENERAL REFERENCES


