Integrating Personality Theories and Self-Determination Theory: An analysis of the influence of personality on goal-directed behaviour and the efficacy of volitional personality change

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Abstract

Personal goals give meaning and direction to our lives and have been established as a reliable pathway to enhanced well-being. The present doctoral thesis contributes to the growing body of literature aimed at strengthening our understanding of factors that are conducive to successful pursuit of various goal-directed behaviours. More specifically, the present work integrated Self-Determination theory (SDT) with theories of personality to enhance our understanding of the motivational dynamics involved in the expression of the Big Five traits when engaging in goal-directed behaviour.

Article 1 and 2 explored the impact of the Big Five traits on the motivational dynamics associated with certain types of goal-directed behaviour and the subsequent progress made in these pursuits. Article 1 investigated the role of the Big Five personality traits in the pursuit of agentic and communal personal goals. The results of Article 1 revealed that being highly conscientious is predictive of greater autonomous motivation for and progress made on agentic goals, which emphasize achievement and mastery. In contrast, being higher on extraversion resulted in a similar set of processes for communal goals, which emphasize interpersonal relationships. The results of Article 1 provide evidence that when individuals select trait-concordant goals, they feel more autonomous in their goal pursuit, which subsequently leads to greater progress.

Article 2 extended the personality-goal matching hypotheses of Article 1 to explore how the Big Five traits related to the motivational dynamics involved in engaging in the goal-directed, health-promoting behaviours associated with social distancing during the global coronavirus pandemic. The pandemic presented the unique opportunity to test how SDT and the concordance between goal-directed behavior and personality could be tested on a large-scale

goal that was shared by the population and that could benefit the state of public health at large. The results confirmed that individual personality differences in conscientiousness and agreeableness, which promote collaboration and cooperation with others, oriented individuals toward more community aspirations and predisposed individuals to better internalizing and feeling more autonomously motivated to comply with the pandemic health guidelines.

Results from Article 1 and 2 confirmed that one's Big Five traits can have important implications for their effectiveness when engaging in goal-directed behaviour. However, what if individuals are pursuing important and meaningful personal goals that are not concordant with their underlying personality traits? Are individuals capable of intentionally changing their personality traits by pursuing a goal to do so? Article 3 built upon recent research on volitional personality change by conducting two longitudinal studies and utilizing an alternate goal-assessment method that was designed to capture individuals with meaningful goal intentions to change their personality traits. Article 3 provided evidence that individuals can effectively make progress on their personality change goals over time and that this progress is associated with improved psychological well-being. Moreover, autonomous motivation when pursuing personality change goals was associated with greater progress. Article 3 contributed to the volitional personality change literature by using an alternate goal-assessment method and integrating SDT to enhance our understanding of how goal-directed behaviour can lead to personality change.

The present work lends evidence to Sheldon & Prentice's (2019) proposal that SDT could serve as a foundational framework for personality psychology.Together, the articles of this thesis enhance our understanding of the ways in which one's standing on the Big Five personality traits

influence one's motivation for and progress made in the pursuit of goal-directed behaviour, and vice versa.

Résumé

Ce travail intègre des concepts de la théorie de l'autodétermination (SDT) aux théories de la personnalité pour améliorer notre compréhension de la dynamique motivationnelle impliquée dans l'expression des cinq grands traits de personnalité (‘Big 5 traits’) lors d'engagements dans des comportements dirigés vers un objectif. Articles 1 et 2 ont exploré l'impact des cinq traits sur la dynamique motivationnelle associée à certains types de comportements orientés vers un objectif et les progrès dans ces poursuites. Article 1 a exploré le rôle des cinq traits dans la poursuite d'objectifs personnels agentiques et communautaires. Les résultats de l'article 1 révèle qu'un niveau de conscience plus élevé est prédictif d'une plus grande motivation autonome et d'un progrès vers les objectifs agentiques, qui mettent l'accent sur la réalisation et la maîtrise. En revanche, un niveau d'extraversion plus élevé est prédictif d'une plus grande motivation autonome et de progrès vers les objectifs communs, qui mettent l'accent sur les relations interpersonnelles. Les résultats prouvent que lorsque les individus choisissent des objectifs concordant avec leurs traits, ils se sentent plus autonomes dans la poursuite de leurs objectifs, ce qui conduit à une progression plus importante des objectifs.

Article 2 suit des hypothèses personnalité-objectif similaires, sauf qu'il explore la manière dont les cinq traits sont liés à la dynamique motivationnelle impliquée dans l'engagement de comportements de promotion de la santé axés sur les objectifs liés à la distanciation sociale de la pandémie COVID-19. La pandémie a offert une opportunité unique de tester SDT et la concordance entre le comportement orienté vers un objectif et la personnalité dans le cadre d'un objectif à grande échelle. Les résultats confirme que les différences dans les traits de la conscience et l'agréabilité, qui favorisent la collaboration et la coopération avec les autres, orientent les individus vers des aspirations plus communautaires et les prédisposent à mieux

intérioriser et à se sentir plus autonomes dans leur motivation à se conformer aux recommandations de santé. Un point méthodologique majeur est que le lien entre les traits d'agréabilité et de conscience et la distanciation sociale a également été confirmé à l'aide de rapports provenant d'amis et de membres de la famille sur la personnalité du participant et ses comportements de distanciation sociale.

Articles 1 et 2 confirment que la classification d'une personne selon les cinq traits peut avoir des conséquences sur sa capacité à adopter un comportement orienté vers un objectif. Article 3 repose sur des recherches récentes sur le changement volontaire de la personnalité en menant deux études longitudinales et en utilisant une autre méthode d'évaluation des objectifs conçue pour capturer les individus ayant des intentions significatives de changer leurs traits de personnalité, plutôt que ceux qui ont des désirs passifs de changement. SDT a été incorporée pour explorer la mesure dans laquelle la poursuite d'un changement de personnalité volontaire reflète des processus motivationnels autonomes. Article 3 démontre que les étudiants universitaires sont capables de progresser dans leurs objectifs de changement de personnalité au cours d'une année et que ces progrès sont associés à une amélioration de leur bien-être psychologique. La motivation autonome pour la poursuite de leurs objectifs de changement de personnalité s'est avérée prédictive d'une progression plus importante des objectifs de changement de personnalité. Article 3 contribue à la littérature sur le changement de personnalité volontaire en utilisant une autre méthode d'évaluation des objectifs qui distingue les désirs de changement des intentions d'objectifs significatifs et intègre SDT pour améliorer notre compréhension de la dynamique motivationnelle du changement de personnalité.

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Contribution of Authors

Three manuscripts were included in the present doctoral thesis. The first manuscript "*A longitudinal investigation of trait-goal concordance on goal progress: The mediating role of autonomous goal motivation*" (Article 1) was co-authored by myself, Dr. Anne Holding, Dr. Brenda Harvey, Dr. Jérémie Verner-Filion, and Dr. Richard Koestner. Article 1 was published in the *Journal of Personality* in 2019. After joining the Human Motivation lab, I became curious about individual personality differences that lead certain individuals to be more effective in the pursuit of various types of goals. I conducted the literature review that led to the research questions that were explored in Article 1 and the ideas and research questions were further developed with the assistance of Richard Koestner, Anne Holding and Brenda Harvey. The longitudinal study design framework was originally developed by Richard Koestner. The data used in Article 1 was collected over two consecutive academic years. The first year of data was collected during the 2015-2016 academic year and this data collection was spearheaded by Anne Holding and Nora Hope, with assistance from other graduate and undergraduate students in the Human Motivation Lab. The second year of data collected was spearheaded by myself and Anne Holding, with assistance from other lab members. I completed the majority of the data analyses and interpreted the data with input from Richard Koestner. Jérémie Verner-Filion and Anne Holding provided statistical support for the structural equation modeling component of the analyses. I wrote the original manuscript with input from Richard Koestner. Editorial assistance was provided by all co-authors prior to submission of the manuscript, as well as during the revision process.

Article 2 "*Agreeableness and Conscientiousness promote successful adaptation to the Covid-19 pandemic through effective internalization of public health guidelin*es" was co-

authored by myself, Dr. Anne Holding, Dr. Shelby Levine, Dr. Theodore Powers and Dr. Richard Koestner. Article 2 was published in *Motivation and Emotion* in 2022. The data used in Article 2 was collected during the 2019-2020 academic year and the data collection was spearheaded by me, with assistance from other graduate and undergraduate students in the Human Motivation lab. The coronavirus pandemic began part-way through the data collection and I completed the research ethics application to add additional coronavirus pandemic-related measures to our ongoing study. I became interested in the individual personality difference variables that may predict which individuals would be more likely to adhere to the social distancing guidelines during the first wave of the pandemic. I conducted the literature review that led to the development of the research questions explored in Article 3, which were further developed with assistance from Dr. Richard Koestner, Dr. Anne Holding, Dr. Shelby Levine, and Dr. Ted Powers. I conducted all of the main analyses in Article 3. Anne Holding provided statistical support for the structural equation modeling component of the analyses. Anne Holding and Richard Koestner assisted with the interpretation of the statistical analyses. I wrote and revised the manuscript, with input from Richard Koestner. I received editorial assistance from all co-authors during the academic journal review process.

Article 3 "*On the efficacy of volitional personality change in young adulthood: Convergent evidence using a longitudinal personal goal paradigm*" was co-authored by myself, Dr. Anne Holding, Lauren Buchardt, Dr. Richard Koestner. Article 3 was published in *Motivation and Emotion* in 2021. Richard Koestner had pointed me in the direction of recent research by Nathan Hudson and Chris Fraley, which sparked my interest in research on volitional personality change. I conducted the literature review that led to the idea of integrating Self-Determination Theory with research on volitional personality change. Research ideas and

questions were further developed with the assistance of Dr. Richard Koestner and Anne Holding. Article 3 comprises two studies. The data for study 1 was collected over four consecutive academic years with a sample of undergraduate university students. The first three years of data collection in Study 1 of Article 3 (2013–2014, 2014–2015, 2015–2016) were spearheaded by Nora Hope and Anne Holding, and the fourth year of data collected was spearheaded by myself and Anne Holding. Other graduate and undergraduate students in the Human Motivation lab also assisted in the various data collections and participant recruitment within Study 1. The data used in the second study in Article 3 was collected by myself, with the help of Frank Kachanoff. Lauren Buchardt used the data from Study 1 to write her undergraduate honours thesis, which I co-supervised with Richard Koestner. Richard Koestner and I conducted the analyses and interpreted the analyses from Study 1. I conducted and interpreted the analyses for study 2, with input from Richard Koestner. I wrote and revised the manuscript, with input from Richard Koestner. I received editorial assistance from all co-authors during the academic journal review process.

Statement of Original Contribution

The first two studies in the present thesis (Article 1 and 2) aimed to add to the growing body of literature on personal goal pursuit by exploring the influence of personality traits on one's motivation for and progress made while engaging in various types of goal-directed behaviour. Sheldon's (2014) self-concordance model argues that the types of goals that people choose to pursue matter because goals that better reflect one's underlying traits, interests, values, and motives are more likely to be achieved and have a more positive impact on well-being (Ryan et al., 1996; Sheldon, 2014). Article 1 made a novel contribution by testing Sheldon's content-matching hypothesis between traits and goals with personal goals that were coded based on whether they were agentic or communal in nature. The idea was that when an individual pursues a personal goal that is consistent with and supported by one's underlying personality (such as when a highly conscientious individual pursues an agentic goal, or when a highly extraverted individual pursues a communal goal), they will experience greater autonomous motivation for that goal and make more progress. The results provided support for this trait-goal matching hypotheses. The relations of Conscientiousness with progress on agentic goals, and of Extraversion with progress on communal goals, were confirmed, as were links with goal-specific indicators of autonomous motivation. Taking it a step further, structural equation modeling analyses highlighted the unique links between Conscientiousness and agentic goal motivation, and between Extraversion and communal goal motivation. In the Self-Determination Theory literature, autonomous motives for personal goals have been repeatedly associated with positive goal-related outcomes, such as greater effort and goal attainment (Holding et al., 2017; Koestner et al., 2008; Sheldon & Elliot, 1998). Therefore, the positive association of autonomous motivation and goal progress supports the Self-determination theory perspective of goal striving.

However, this work also adds an important theoretical wrinkle by highlighting the motivational benefits of trait-goal matching in goal pursuit. Although previous research pointed to linkages of Conscientiousness and Extraversion with different types of goals (e.g., achievement vs. social), no previous study to our knowledge has used a longitudinal design to test the hypothesis that matching these traits with goal content would result in significantly greater goal progress over time. Instead, previous research has focused on links with concurrent feelings of subjective satisfaction or well-being (e.g., McGregor et al., 2006).

The unprecedented global coronavirus pandemic took the world by storm and changed the way many of us live our day to day lives. Researchers across the globe sprang into action launching research studies to help understand and explain the unique and unusual psychological phenomena that occurred during the pandemic. Related to the present work, the pandemic offered a unique opportunity to explore how Self-Determination Theory and the concordance between goal-directed behavior and personality could be tested on the large-scale goal of social distancing that was shared by the population and that could benefit the state of public health at large. Article 2 made a novel contribution to the literature that enhanced our understanding of how individual personality and motivational factors influenced our motivation and willingness to adhere to the social distancing guidelines during the pandemic. More specifically, it was found that individuals who were higher on trait agreeableness and conscientiousness engaged in more social distancing because they more effectively internalized the importance and value of the guidelines (i.e., had more autonomous motivation for social distancing) as a function of their concerns about the welfare of their communities. Zajenkowski et al., 2020 explored how the Big Five traits related to the adherence of social distancing guidelines and found agreeableness to be the only Big Five trait associated with adhering to social distancing measures. One of the aims of

article 2 was to replicate these findings using a longitudinal design, and extend this research by also incorporating Self-Determination theory's concept of autonomous motivation to see whether their level of internalization of the COVID-19 public health guidelines mediated the relation between the Big Five traits and adherence to the social distancing guidelines. Additionally, other researchers explored the relation between autonomous motivation for social distancing and social distancing behaviours (Guay et al., 2021; Legate et al, 2022). However, to the best of our knowledge, Article 2 was the first study to integrate Self-determination theory and theories of personality into one coherent model using a longitudinal design, with the goal of enhancing our understanding of individual personality and motivation factor conducive to better adherence to social distancing measures during the pandemic. Lastly, another strength of this study that lends to its novel contribution was the incorporation of informant friend and family reports that validated the relation of the Big 5 traits to social distancing behaviours.

Article 3 proposed a novel alternate methodology to assess and track the progress made on personality change goals. To our knowledge, this study was the first to use the goal assessment method outlined in Koestner et al. (2002) to assess personality change goals. Past personality change goal assessment methodology had participants respond to trait-related statements and indicate how much they would like to be more or less like this trait. The alternate methodology put forward in Article 3 was thought to be a more effective and discerning method of capture participants pursuing personality change as it is thought to capture participants with true goal intentions to change their personality, rather than passive desires. In addition, Article 3 was the first to integrate recent research on volitional personality change with Self-Determination Theory to explore the autonomous motivational dynamics involved in personality change.

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List of Abbreviations

Agentic Goal (AG)

Agreeableness (Agree.)

Autonomous Motivation (Aut. Mot.)

Communal Goal (CG)

Concientiousness (Consci.)

Controlled Motivation (Con. Mot.)

Community Values (Com. Val.)

Depressive Symptoms (Dep. Symp.)

Goal Progress (GP)

Personality Change Goal (PCG)

Progress (Prog.)

Relative Autonomy (Rel. Aut.)

Self-Determination Theory (SDT)

Social Distancing (SD)

Well-Being (WB)

General Introduction

"*The powerful play goes on, and you may contribute a verse*"

– Walt Whitman, Oh Me! Oh Life!

"*All the world's a stage,*

And all the men and women merely players;

They have their exits and entrances;

And one man in his time plays many parts..."

– William Shakespeare, As You Like It.

The above quotes illustrate that, as McAdams (2015) discussed, from the time we are born, we are all part of this powerful social play. Our personalities describe *how* we play our part on the stage of life. Moreover, our motivation determines *why* we play certain parts and has an essential role in determining the goal-directed behaviours that we are motivated to move towards. The overarching aim of the present work was to integrate theories of personality with Self-Determination Theory, an empirically-based, macro-theory of human motivation, to enhance our understanding of the ways in which our personality and motivation interact with one another in meaningful ways and lead to successful goals pursuit, personality developmental and positive well-being.

Personality Theories

Generally, personality is thought of as the characteristics and qualities that form an individual's distinctive character. The field of personality has a long-standing, rich and complex history. For several decades, researchers have put forth several theories trying to best capture and describe the elements of human personality – elements that range from theories of "traits, motivation, cognitions, social contexts and biological factors" (John et al., 2016). When taking a step back and reflecting on the people around us, what does it mean for us to know and understand someone's personality well? Upon reflection, it likely becomes apparent that, in order to truly know somebody well, our understanding of the person must go beyond any one proposed element of personality and encompass several aspects of the whole person. Indeed, we likely think of how they tend to act, what they value, what goals they are working towards, as well as their past life experience. It is for this reason that there has been a movement in personality psychology towards a more integrative and unified theory of personality that views the person as a whole, rather than focusing on any one aspect.

Notably, McAdams (2015) put forth a three-tier model of personality development that integrates various elements of personality and provides a coherent and integrative account of personality development. The three levels of personality layer and build upon one another by adding depth and complexity to the person, and each providing a different standpoint from which the individual may consider the self and their relation to the world. The first layer of personality comprises one's dispositional traits, which is the fundamental unit of personality and refers to consistencies in social-emotional functioning. Layer one describes how each individual is a "social actor", referring to the signature ways in which the individual moves through the world. The second layer is one's personal concerns (i.e. one's personal goals, projects, aspirations, and

values) and describes the individual as a "motivated agent". This second layer explains the reasons and motivations behind one's actions and what the person is motivated to move towards in the future. The third layer of personality comprises the ways in which an individual is the "author" of their own life narrative. Over time, individuals formulate coherent and meaningful stories of their lives, which are essential for identity formation and understanding yourself as a coherent person across time. For a complete understanding of our personalities, one must consider the ways they are a "social actor" (i.e. how we act), the ways in which they are "motivated agents" (i.e. why we act) and as the "author" (i.e. our understanding of how and why we act over time). Although we all have these different layers of personality, we experience ourselves as whole, complete persons; it is for this reason that it is important to understand how the self as the actor, agent and author may overlap and interact with each other in meaningful ways.

The present work aimed to integrate Self-Determination Theory with theories of personality to enhance our understanding of the bidirectional influence of one's dispositional traits at the first level of personality, on one's motivation and effectiveness in goal-directed behaviour at the second level of personality (i.e. personal concerns). In other words, the present work explores the ways in which personality traits influence goal-directed behaviours and vice versa. This work will begin by further elaborating on how dispositional traits and personal concerns are conceptualized within the literature, followed by an introduction to Self-Determination Theory. Subsequently, there will be an exploration of the ways in which Self-Determination Theory can be integrated with personality theories to enhance our understanding of the motivational dynamics involved in the expression of the Big Five traits when engaging in goal directed behaviours.

Layer one of personality: Dispositional Traits

Personality traits, which refer to consistencies in patterns of thought, feelings and behaviours, are thought to be best captured by the widely accepted Big Five trait taxonomy (John et al., 2008). A lexical approach was first taken in the development of the Big Five traits, whereby researchers narrowed down the approximately 18,000 trait descriptors found in the English dictionary to 180 adjective describing distinct trait-like qualities. From there, factor analytic methods were employed in order to obtain meaningful clusters of items that represent the five unique broad dimensions of personality traits: agreeableness, conscientiousness, extraversion, openness to experience and neuroticism (John et al., 2008). Each of the five traits represents a continuum ranging from a more socially desirable, adaptive pole, to a less socially desirable, maladaptive pole. To define each of the Big Five trait dimensions, individuals high on the agreeableness continuum are characterized as being good natured, soft-hearted, courteous, forgiving and sympathetic, whereas individuals lower on this dimension are quarrelsome, suspicious, critical, cold, unkind and uncooperative. Individuals high on extraversion are described as sociable, fun-loving, talkative and assertive, whereas individuals on the other end are introverted, unenergetic, reserved, unassertive and quiet. Individuals high on conscientiousness are responsible, reliable, well-organized, self-disciplined and persevering, whereas individuals low on conscientiousness are impulsive, careless, disorganized and irresponsible. Individuals high on openness to experience are thought to be original, non-conventional, imaginative, creative, complex, curious and as having broad interests, whereas individual low on this trait are closed-minded, imperceptive, unanalytical, uninquisitive, uninventive and traditional. Lastly, high neuroticism refers to the tendency to being highly nervous, high-strung, insecure, self-pitying and vulnerable, whereas being low on neuroticism is

characterized by emotional stability, calmness, with a sense of being relaxed and at ease in life (McCrae & Costa, 1985).

The Big Five trait theory provided the field of personality research with a descriptive model of personality that facilitated the accumulation and communication of empirical work that would enhance our understanding of human personality and the ways in which personality traits extensively influences important outcomes in various life domains. McAdams (2015) argues that traits are the first thing we notice in others and are the most fundamental thing we can know about another person. A limitation of the Big Five model of personality is that it is not a complete and comprehensive theory of personality, as it provides primarily descriptive accounts of personality, rather than explanatory ones. In other words, traits describe *how* people act (e.g., this person is conscientious in that they are reliable, hardworking and organized), but does not explain *why* people act (e.g., why is this person motivated to behave conscientiously). It is for this reason that McAdams (2015) argues that it is essential to move beyond dispositional traits and consider other layers of personality in order to gain a deeper understanding of individuals' personalities.

Layer Two of Personality: Personal Concerns

According to McAdams (2015), the second level of personality encompasses one's personal concerns, which "*consists of a dynamic arrangement of evolving goals, motives, strivings, values, plans, programs, and projects that speak to what a person aims to accomplish or realize in life*" (p. 5). At this second level of personality, we can understand the individual as a "motivated agent" and their goal-directed behaviour as being reflective of what they value and are motivated to work towards over time.

There are numerous ways that the second layer of personality can be conceptualized and operationalized within research. For example, one could consider one's core values, motives, aspirations, personal goals and life projects. The aspect of the second layer that will be the focus of the present work will be one's personal goals, as they are a fundamental and essential part of our lives. Indeed, personal goals have even been referred to as the "*linchpin of psychological organization*" (Klinger, 1987). They are defined as mental representations of desired outcomes that people are working towards (Carver & Scheier, 2000; 2005). We are all continuously engaging in goal-directed behaviours, whether we are trying to improve our health, build and maintain social connections or working towards a promotion at work. McAdams (2015) would argue that personal goals are reflections of an individual's priorities, interests and values and are essential for personality development and building a meaningful life. Research has consistently found that making progress on personal goals is associated with positive well-being and life satisfaction (Brunstein, 1993; Deci & Ryan, 2017; Diener et al., 2002), whereas failing to make progress on goals is linked to diminished well-being (Diener et al., 1999). Even though successful goal-directed behaviour is crucial for positive development and well-being, there is great variation in how successful people are in their pursuits, which has fueled decades of research on personal goals aimed at understanding factors that are conducive to more successful goal-directed behaviour.

Of note, one's personal narrative on the third layer of personality likely interacts with the other layers of personality in meaningful and important ways. For example, it's plausible that someone high on neuroticism selectively pays attention to more negative life events and subsequently develops a personal narrative with themes of "contamination", which McAdams (2015) describes as life story themes where one's life events and experiences started out

positively and then unfortunately take a sour turn. While exploring how one's personal narrative influences and interacts with one's dispositional traits and personal concerns certainly warrants further attention in the literature, this line of work is beyond the scope of the present thesis.

Self-Determination Theory

Given that personal goals are such a vital source of sustained well-being, it is useful to consider motivational theories that can reliably predict the types of goal-directed behaviour that are likely to be fueled by prolonged effort and result in greater goal progress. Self-Determination Theory is an empirically based, macro-theory of human motivation and personality development, which highlights the importance of exploring the volitional dynamics of behavior and the social-contextual factors that promote or thwart human flourishing (Ryan & Deci, 2017). Self-Determination Theory comprises six mini-theories that each describe different empirically supported personality and/or motivational phenomena. The first mini-theory is Cognitive Evaluation Theory, which details the concept of intrinsic motivation, defined as the motivation one has when engaging in behaviour purely for the fun and enjoyment it brings. The second mini-theory is Organismic Integration Theory, which addresses the continuum upon which extrinsically motivated behaviour (i.e., behaviour that is instrumental, rather than fun and enjoyable in its own right) can become internalized and integrated with the self. The third mini-theory is Causality Orientations Theory, which represents Self-Determination Theory's first attempt at integrating with personality theories. The Causality Orientation Theory proposed three personality styles (i.e., autonomy, controlled and impersonal orientation) that capture people's tendency to orient towards different styles of self-regulation or environments that support or thwart their autonomy. The fourth mini-theory is Basic Psychological Need Theory, which argues that human beings universally have three basic psychological needs (i.e., autonomy,

relatedness and competence) that must be satisfied in order to attain optimal well-being and functioning. The fifth mini-theory is Goal Contents Theory, which posits that there is an is empirically supported distinction between intrinsic (i.e., personal growth, community and personality relationships) and extrinsic (i.e., financial success, fame and image) goals, values and aspirations in terms of how much they are associated with the satisfaction the three basic psychological needs and psychological well-being. Finally, the sixth mini theory is Relationship Motivation Theory, which highlights the influence of interpersonal relationships on the satisfaction of the three basic psychological needs. Overall, Self-Determination Theory makes important predictions about the kind of motivational elements that facilitate progress of goal-directed behaviour and result in enhanced well-being (Ryan & Deci, 2017; Sheldon & Elliott, 1999; Sheldon, 2014).

A special issue of the Journal of Personality considered whether Self-Determination Theory can serve as a foundation, or "grand theory", for personality researchers (Sheldon & Prentice, 2019). In support of this, Sheldon and Prentice (2019) argued that Self-Determination Theory provides important conceptual tools for personality theory to understand positive change and development, and the role that individual differences in personality may play in goal-directed behaviour. Of particular relevance to the present work, Sheldon and Prentice (2019) explored how Self-Determination Theory's second mini-theory, Organismic Integration Theory, which introduces the relative autonomy continuum, can explain how the dynamics of motivational autonomy, can be integrated with personality theories to enhance our understanding of personality development (Ryan & Connell, 1989; Ryan & Deci, 2017).

The relative autonomy continuum highlights that it is not necessarily the quantity of motivation that someone has when engaging in goal-directed behaviour that is important, but

rather the quality of their motivation. Sheldon and Prentice (2019) note that "*according to this model, any and every motivated behavior, whatever its other attributes, can be located on a continuum ranging from controlled to autonomous*". Ryan and Deci (2017) explain that the relative autonomy continuum recognizes various forms of motivation along the continuum that represent the level at which the goal-directed behaviour has been integrated with the self and is perceived as generated by the self (i.e., having an internal locus of causality). At the least autonomous end of the spectrum is amotivation, which involves a person apathetically engaging in goal directed behaviour with no solidified aim or purpose. With amotivation, the individual is just going through the motions and has no internalized sense of why they are acting or behaving. The second least autonomous, and most controlled, form of motivation is external motivation, which involves an individual being motivated to act and behave solely due to external reward and punishment. When an individual is acting with external motivation, they will engage in the behaviour when reinforcements are present, but will disengage in their absence, as they have no internalized, self-generated motivation to act. Next along the continuum is introjected motivation, whereby an individual has partially internalized the behaviour and will continue to behave in the absence of external reinforces, but they are doing so to avoid internal feelings of guilt or shame, rather than engaging in the behaviour because it aligns with their own true wants and desires. Moving into the more autonomous portion of the continuum, next is identified motivation where, even though engaging in the behaviour is not necessarily fun and exciting in its own right, the individual is still motivated to engage as they have internalize the behaviour as something important and meaningful. Next is integrated motivation, where the individual has more fully internalized the goal-directed behaviour and believe it represents who they are and reflects what they value most in life. On the most autonomous end of the spectrum is intrinsic

motivation, where the individual engages in the behaviour out of true interest and for the fun and enjoyment the activity itself will bring (Ryan & Deci, 2017).

It's important to note that individuals can often feel motivated to engage in goal-directed behaviour for multiple reasons that are associated with different types motivation; this means that individuals can simultaneously have both autonomous and controlled reasons to engage in behaviour (Ryan & Deci, 2017). It is for this reasons that researchers often consider the "relative autonomy" of one's motivation, which involves creating an index by subtracting the mean of the controlled items from that of the autonomous items to consider how autonomous versus controlled the quality of one's motivation is (Ryan & Connell, 1989; Ryan and Deci 2017; Sheldon, 2014). To assess one's autonomous motivation for goal pursuit, researchers typically combine the items used to capture intrinsic (e.g., *because of the fun and enjoyment which the goal provided you—the primary reason is simply your interest in the experience itself*), integrated (e.g., *because it represents who you are and reflects what you value most in life*), and identified (e.g., *because you really believe that it is an important goal to have—you endorse it freely and value it wholeheartedly*) motivational reasons, whereas they combine introjected (e.g., *Because you would feel ashamed, guilty, or anxious if you didn't—you feel that you ought to work on this*) and external (e.g., *because somebody else wants you to and because you'll get something from somebody if you do*) reasons to capture controlled motivation (Sheldon, 2014; Sheldon & Kasser, 1998). Researchers have often found that it is the relative amount of autonomous versus controlled motivation what determines outcomes (Ryan & Connell, 1989). However, researchers have also advocated for considering autonomous and controlled motivation separately because autonomous and controlled motivation has been found to be predictive of different goal-related outcomes (Koestner et al., 2008). For example, Judge et al.

(2005) found that autonomous goals were associated with positive outcomes, whereas controlled goals were unrelated to outcomes, rather than being negatively related to positive outcomes.

Overall, the relative autonomy continuum captures whether a goal is selected and pursued half-heartedly or whole-heartedly, with a sense of personal endorsement or with a sense of alienation. Knowledge of the location on the continuum (i.e., how autonomously motivated someone's behaviour is) allows one to predict much about the way the person is likely to function, as well as the outcomes he or she can achieve. Sheldon & Prentice (2019) suggested that integrating the concept of the relative autonomy continuum with personality theories can shed light on how and when certain personality traits may be expressed in the pursuit of certain goals, and how certain goal-directed behaviour can result in meaningful personality change and development.

An objective of the present work was to add to the growing body of literature exploring variations in goal progress by exploring how the first layer of personality (i.e., Big Five traits) influences the second layer of personality (i.e., personal concerns and goals), and vice versa. More specifically, Article 1 and 2 will explore the impact of the various Big Five traits on the pursuit of certain types of goal-directed behavior. Article 3 will explore whether it is possible to change our Big Five traits by pursuing personal goals to do so. Self-Determination Theory's concept of the relative autonomy continuum will be explored as an explanatory variable linking personality traits to the pursuit of goal-directed behaviour.

The Influence of Personality Traits on Goal-Directed Behaviour

Sheldon's (2014) self-concordance model posits that the type of goals that people choose to pursue is consequential because goals that better reflect one's underlying traits, interests,

values, and motives have a greater likelihood of being achieved and will more positively impact one's well-being (Ryan et al., 1996; Sheldon, 2014). Alternatively, choosing the "wrong" goals to pursue, meaning those which are not self-concordant, can result in much wasted time, energy and a sense of dissatisfaction even when goal progress is made (Sheldon, 2014; Sheldon & Elliot, 1999; Sheldon & Kasser, 1998). Mapping the self-concordance model onto McAdam's 3-level framework of personality, one's personal goals would be at the second level of personality (i.e., personal concerns) and Sheldon (2004) would argue that setting goals that are consistent with and match the content of the other two tiers of personality (i.e., dispositional traits or personal narrative) or other elements at the level of personal concerns (e.g., values) is generally beneficial. There are various ways in which matching the content of one's goals to other features of their personality (e.g., personality traits, motives, values, self-narratives) can be conceptualized and researched (Sheldon, 2014). For example, research has found that the concordance between the content of one's personal goals and their overarching values is positively related to vitality and life-satisfaction (Sheldon & Kasser, 1995). Moreover, Sheldon and Tan (2007) asked participants to rate the alignment of their goals with their traits and reported evidence that personality-goal matching was significantly positively associated with subjective well-being. Furthermore, McAdams and Little (2006) found evidence that pursuing personal goals that match one's underlying personality traits is associated with more happiness; however, this work did not explore whether concordance between traits and the content of personal goals translates into actual goal progress. The present work aimed to test Sheldon's self-concordance more by exploring the extent to which consistency between one's personality traits and the content of one's personal goals proves advantageous in making greater goal progress.

The reason that it is posited that selecting personal goals that are more consistent with one's underlying personality is so beneficial to goal pursuit is because these goals are thought to be in line with one's "growth potentials" (Sheldon, 2014); this means that personal goals that match with one's underlying traits are able to capitalize on the individual's underlying resources, capabilities and motivation, which can help the individual more effectively work towards their goals and build a satisfying life. The idea of traits being resources and tools for personal goal pursuit has recently been explored in Whole Trait Theory (Fleeson & Jayawickcreme, 2015). Whole trait theory distinguishes between the descriptive and explanatory aspects of traits. The descriptive facet of traits refers to the momentary enactment of trait-specific behaviours. For example, if someone is enacting their trait conscientiousness, they are enacting trait-consistent behaviours, such as reliability, organization, responsibility and self-discipline, which would act as resources (or "tools") in efforts to accomplish certain goals. The explanatory part of the trait represents the motivational elements that explain momentary enactments in traits (Prentice, Jayawickreme & Fleeson, 2018). For example, the explanatory aspect of the trait would explain why someone is currently enacting certain traits tools. In other words, the explanatory aspect would describe why someone is currently enacting their conscientious trait "tools" of being reliable, organized, responsible and self-disciplined. In sum, Whole Trait Theory posits that traits act as tools for goal pursuit in that the enactment of certain trait-consistent behaviours will fluctuate in service of the specific goal being pursued. If an individual is higher on a particular trait, they would theoretically have more optimal "trait tools" when pursuing specific types of goal-directed behaviour for which certain trait-consistent behaviour would be called for. Continuing with the example of conscientiousness, if an individual is pursuing an achievement-oriented goal, which would likely require them to be reliable, organized, responsible and self-

disciplined, a person who is highly conscientious would be theorized to have a well-equipped "toolbox" for this pursuit.

In support of this idea of traits as "tools" for goal pursuit, within a series of studies, McCabe and Fleeson (2016) have demonstrated that momentary manifestations of Conscientiousness and Extraversion were explained by differences in goal pursuits. Thus, when participants were pursuing a time-efficiency goal, they enacted conscientious behaviors, whereas when they pursued a social dominance goal (social dominance being a facet of extraversion), they tended to behave in extraverted ways. This suggests that the traits of Conscientiousness and Extraversion are discriminatively associated with different types of goals (e.g., efficiency vs. social goals). This implies that, in regards to personal goals that are typically framed over long periods of time and entail effortful persistence in the face of obstacles and action crises (Holding et al., 2017), certain "trait tools" are more likely to be enacted in pursuit of this goal, and a person who is higher on the relevant trait would likely have an advantage. For example, extraversion entails being sociable, fun-loving, talkative and assertive, which are characteristics that would provide someone with the optimal tools for pursuing a socially-oriented goal, such as making new friends or finding a romantic partner. A highly extraverted individual will likely be more effective in enacting the "tools" necessary for successful attainment of a socially-oriented goal. Additionally, conscientiousness, which is defined as being careful, reliable, well-organized, self-disciplined and persevering, may be especially important for the pursuit of achievement-oriented goals, such as school or work performance over time, since these tasks likely require many of the qualities associated with Conscientiousness. Past research has suggested Conscientiousness as a relevant and important trait in the pursuit of all types of goals, however, there is evidence of conscientiousness being especially important in the pursuit of more

achievement-related goals, such as school and work performance (Judge & Ilies, 2002; McCrae & John, 1992; Roberts et al., 2014).

Moreover, Prentice and colleagues (2018) recently suggested that the motivational processes that shed light on why people vary in their trait manifestations (and in their goal successes) can be explained by integrating Self-Determination Theory's concept of the relative autonomy continuum with Whole Trait Theory (Prentice et al., 2019; Ryan & Deci, 2017). Indeed, content-matching between personality traits and personal goals likely leads one's goal pursuits to feel more easy, natural and autonomous as it is consistent with the individuals underlying "trait tools", meaning it would be more consistent with resources available to the individual through their traits. Importantly, research has consistently shown that having more autonomous motivation for goal pursuits is predictive of the generation of goal-directed effort (Sheldon & Elliot, 1998; Werner et al., 2016), decreased goal ambivalence (Koletzko et al., 2015), decreased action crises (Holding et al., 2017), and, most importantly, increased goal progress (Koestner et al., 2006; Koestner et al., 2002). Taken altogether, content-matching between an individual's personality traits and their personal goals, means that the individual will have optimal tools to engage in the goal-directed behaviour required for that goal, which likely leads to greater autonomous motivation for goal pursuit and facilitates goal progress. Returning to the example of a highly extraverted individual pursuing a socially-oriented goal, these individuals would be equipped with the tools of sociability, talkativeness and assertiveness, which would lead this type of goal to feel more autonomous and natural for them. Moreover, they would have a motivational advantage when pursuing these more self-concordant goals and will therefore make more progress. In contrast, a more introverted individual, who is more

reserved, quiet and unenergetic, would have more suboptimal “trait tools” when pursuing the same socially-oriented goals and will have less of a motivational advantage.

Thus far, I have aimed to integrate Self-Determination Theory with theories of personality to help understand the role of the Big Five traits in goal-directed behaviour. Self-Determination Theory can help us understand the motivational processes by which specific traits have an impact on goal selection and goal pursuit. Within Article 1 and Article 2, Sheldon's (2014) self-concordance model was tested by exploring the influence of the Big Five traits on certain types of goal-directed behaviour. The present work sought to examine trait-goal matching and whether it provides a motivational advantage that facilitates individuals making more progress on their goals over time.

First, Article 1 explored the influence of the Big Five traits on personal goals that were coded based on whether they were agentic or communal in nature. The distinction between agentic and communal motivational themes has a long history in personality psychology and has previously been applied to the content of the personal goals that individuals select and pursue (Bakan, 1966; Emmons & McAdams, 1991; McAdams et al., 1996; Sheldon & Cooper, 2008). The content of an agentic goals is related to self-expansion, achievement, and mastery of the environment (e.g., *obtain a certain grade in my studies* or *improve my proficiency in the French language*). The content of communal goals is related to creating, maintaining, and/or improving interpersonal relationships (e.g., *improve my communication with my romantic partner* or *make more friends*). Sheldon and Cooper (2008) found evidence that making progress on agentic and communal goals is associated with enhanced well-being; therefore, understanding factors that are conducive to making progress on these types of goals is an endeavor of great value.

Next, Article 2 explored how the Big Five traits influenced the adoption of the "emergency goal" of social distancing during the global coronavirus pandemic in 2020. Seeing as the virus infected hundreds of millions of people and claimed the lives of over 6 million people, the COVID-19 pandemic posed an alarming global health crisis. In an attempt to slow the spread of the virus, governments put forth guidelines for social distancing, which involved citizens changing their everyday routines in order to minimize close contact with others, such as avoiding crowded places and non-essential gatherings, limiting contact with people outside one's household, keeping a distance of at least 2 arms lengths from others, and wearing a mask (when keeping 2 meter distances from others is not possible). During the pandemic, research emerged indicating social distancing as an effective strategy for slowing the spread of the virus, yet there was significant variation in the extent to which individuals were willing to adopt the goal-directed behaviour of social distancing (Matrajt & Leung, 2020). The global pandemic presented the unique opportunity to test how Self-Determination Theory and concordance between goal-directed behavior and personality could be tested on a large-scale goal that was shared by the population and that could benefit the state of public health at large.

Integrating Self-Determination Theory, it was hypothesized that an individual's adherence to the social distancing guidelines depends on how autonomously motivated they were to engage in the behaviour. In other words, people's engagement in social distancing is likely dependent on whether they internalized the importance and value of social distancing and adhering to public health guidelines. Recent research has emerged supporting the hypothesis of autonomous motivation for social distancing predicting adherence to public health guidelines (Guay et al., 2021; Legate et al, 2022). Article 3 aimed to extend recent research exploring the relation between autonomous motivation and social distancing by exploring individual difference

variables that may facilitate an individual having autonomous motivation for engaging in social distancing. The virus was especially dangerous for those with underlying health conditions (e.g., those with compromised immune systems), which means that, for the majority of people, social distancing was less about reducing one's own risk of becoming ill themselves, and more about protecting the community at large. Therefore, it was hypothesized that underlying personality elements that would orient someone towards being more cooperative and collaborative (e.g., agreeableness, conscientiousness, community-oriented values) would make the goal-directed behaviour of social distancing more self-concordant, which would facilitate the integration of the goal with themselves (i.e., making it more autonomous), which would subsequently lead to greater adherence to social distancing guidelines.

The influence of personal goal pursuit on personality

The previous section explored whether dispositional traits (i.e., level 1 of personality) influence one's pursuit of and motivation for goal directed behaviour (i.e., level 2 of personality). A natural next question is whether the opposite is true – can goal-directed behaviour influence one's standing on the Big Five Traits? In other words, can an individual change their standing on the Big Five Traits by pursuing a goal to change their personality? Additionally, what role would autonomous motivation play in the pursuit of personality change goals?

Certain traits are more desirable and, as previously discussed, may provide an advantage when pursuing certain types of goal pursuits, such as being hardworking and reliable (high on conscientiousness) when pursuing more achievement-related (i.e., agentic) goal pursuits or being sociable and talkative (high on extraversion) when pursuing more socially-oriented (i.e., communal) goals. In contrast, other traits are less socially desirable and may not provide the same benefit when pursuing certain goals. If it is being suggested that personality traits can act as

tools for certain types of goal pursuit, this means that certain individual's toolboxes may have been furnished with more optimal tools. Are people stuck with the trait toolboxes they have or are we capable of changing our personality traits? The optimistic news is that, while research has shown that the Big Five traits do have high levels of temporal stability, there is now considerable evidence that one's standing on the Big Five traits is not as stable as previously thought (McAdams, 2015). Indeed, research has found evidence to support that individuals experience normative, age-graded change on the Big Five Traits. For example, across the lifespan (especially during young adulthood), individuals have a tendency to become more emotionally stable, agreeable, and conscientious (Roberts & Mroczek, 2008); individuals also tend to become more socially dominant, which is a key facet of extraversion. Additionally, there is considerable evidence that person-specific change on the Big Five traits occurs as a result of various of life experiences. For example, academic sojourns have been associated with increases on openness to experience (Greischel et al., 2016), finding a romantic partner has been associated with reduced neuroticism and increased conscientiousness and social dominance (Lehnart et al., 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007), and starting a career has been associated with increased conscientiousness (Hudson & Roberts, 2016). Moreover, a quantitative review demonstrated that psychological interventions, such as psychotherapy or assertiveness training, can reliably change personality traits in a positive direction, especially when it comes to neuroticism (Roberts et al., 2017). The evidence suggesting that one's standing on the Big Five Traits changes across the lifespan due to various life circumstance and experiences is optimistic news for individuals who are dissatisfied with their trait "toolboxes", or finding that their personality is getting in the way of their goal pursuits. However, can someone intentionally change their personality by setting a goal to do so?

Brian Little's (2008) free trait theory provides evidence that individuals are capable of temporarily stretching their natural personality in the pursuit of important and meaningful (and theoretically autonomous) personal goals or projects. Little (2008) defines free traits as intentional enactments of trait-relevant behaviours in the pursuit of core personal goals, regardless of one's standing on the Big Five traits. For example, if a more introverted individual, who has a tendency to be rather quiet and reserved, has a dream of becoming a professor, which involves interacting with students and presenting lecture material to large audiences, this individual is potentially capable of temporarily stretching their personality and behaving in more extraverted ways while teaching. Mapping this on to McAdams' (2015) three-layer model of personality, according Free Trait Theory, individuals are capable of temporarily overriding their standing on dispositional traits at the first level of personality, in the pursuit of important and meaningful goal-directed behaviour at the second level of personality. An important caveat of Free Trait Theory is that stretching one's personality in order to accomplish goals is not an indefinitely sustainable endeavor and comes at a cost to one's well-being over time. Stretching one's personality is like working a muscle that gets tired and requires time to recharge and recuperate after being used. Free trait theory suggests that enacting certain traits is possible temporarily, even if it's inconsistent with your underlying standing on that trait. However, is it possible that after working this "muscle" in pursuit of important and meaningful life goals, that this change can eventually transition into a deeper and long-term shift in one's dispositional traits that results in less and less recuperation time after being? Perhaps the meaningful personal goal itself could be to change one's standing on the Big Five traits and have a personality that is more consistent with what you value and who you want to be. Overtime, perhaps with extensive use of

certain trait-related “muscles”, that muscle will become easier and more natural to put to use and become a more permanent tool in the individual’s trait tool box.

Recent research has begun exploring the research question of whether we can intentionally change our personality traits long-term by setting a goal to do so. Researchers have coined the term “volitional personality change”, which is defined as people’s desires and attempts to change their own personality traits (Hudson & Fraley, 2017; Hudson et al., 2020). In order to assess whether an individual has a desire to engage in volitional personality change, researchers developed a methodology by adapting the Big Five Inventory (John & Srivastava, 1999), which is a widely used scale for assessing the Big Five Traits (Hudson & Roberts, 2014). The Big Five Inventory is a 44-item scale that presents trait-related adjectives and asks research participants to indicate the extent to which the adjective is reflective of how they typically behave (John & Srivastava, 1999). In order to assess whether an individual is pursuing volitional personality change, researchers adapted the anchors of the Big Five Inventory scale to instead ask individuals to respond to each of the trait-related adjectives about the extent to which they wanted to increase, stay the same, or decrease on each of the 44 Big Five Inventory trait term items (Hudson & Roberts 2014). Results across at least five studies reveal that a clear majority of young adults endorse having a desire to change their standing on the Big Five Trait dimensions, especially towards the more socially desirable end of each trait (Baranski et al., 2017; Hudson & Fraley, 2016b; Hudson et al. 2020, Hudson & Roberts, 2014; Miller et al., 2019; Robinson et al., 2015). In other words, the majority of people endorse that they have a desire to become more conscientious, agreeable, extraverted, open to experience and emotionally stable, which is the positive pole of neuroticism.

A prevalent desire to change on the Big Five Traits has been found in samples of people from diverse nations and across the lifespan, although the desire to change is marginally less prevalent during older adulthood and older adults desire to change their traits to a more moderate degree (Hudson & Fraley, 2016b; Robinson et al., 2015). Moreover, it was generally those individuals at the less socially desirable end of each bipolar Big Five Trait dimension who had a goal to change on that trait (Hudson & Fraley, 2016a; Hudson et al., 2020). For example, it was the more neurotic individuals who were more likely to indicate a desire to become more emotionally stable. Furthermore, in line with the view of traits as tools for goal pursuit, it was found that being discontented with one's performance in a particular domain was associated with a desire to change on relevant traits (Hudson & Roberts, 2014). For example, a university student who is unhappy with their academic performance would desire to become more conscientious (e.g., hard-working, reliable, consistent), which would provide them with the trait tools to be more effective in their pursuits (Hudson et al., 2020). These findings suggests that when one is dissatisfied with their personality or is pursuing a goal for which their underlying traits are not well-matched, this can prompt a desire to change their Big Five Traits.

It appears that many individuals have the desire to change their standing on the Big Five Traits, however, does having a desire to change one's standing on the Big Five Traits translate into actual changes in behavior and long-term trait change? Thus far, the research on whether desires translate into trait change is encouraging, albeit inconsistent and inconclusive. In their study 1, Hudson and Fraley (2015) found that participants having a desire to change on a specific trait predicted subsequent self-reported change on that trait for all of the Big Five Traits except for openness to experience, whereas in their study 2, a desire to change predicted trait change for all five of the traits. Hudson and Fraley (2016a) found that volitional personality change goals

were predictive of change on extraversion, agreeableness, and emotional stability, although not conscientiousness and openness. Hudson et al. (2020) conducted analyses aggregating across twelve longitudinal studies conducted within their lab and found that desire to change predicted change on all five traits. Robinson et al. (2015) developed a simplified trait change goal assessment methodology to assess one's desire to change on the Big Five Traits. They created a one-item-per trait scale where each item named the trait and provided six adjectives that are associated with that trait (e.g., *Extraversion – characterized by being active, assertive, energetic, enthusiastic, outgoing, talkative*) and asked the participant whether they have a goal to be more or less like this, or no goal at all. Interestingly, they found the desire to change on the Big Five Traits to be unrelated to trait change over a 12-month period, and even found that the change occurred opposite of the desired direction for conscientiousness and neuroticism. Overall, these studies provide encouraging evidence that volitional personality change is possible. However, there are inconsistencies in whether volitional trait change is possible for all of the Big Five Traits. An aim of the present work will be to closely consider the methodology that had been previously used in volitional personality change research and explore whether there are methodology-related influences that could be leading to these inconsistent findings.

It is thought that individuals seek to change their personality because they anticipate that it will mitigate their dissatisfaction with their lives and themselves (Hudson & Fraley, 2016a; Hudson et al., 2020). A large part of whether this prediction comes to fruition is dependent on whether this desire to change translates into actual progress made. Indeed, university students' desire to change on the traits of conscientiousness and openness to experience at the beginning of a semester was associated with decreases in adjustment over the course of the semester (Hudson & Fraley, 2016a). However, students who succeeded at increasing in the desired direction on any

of the Big Five Traits over the course of the semester experienced simultaneous gains in well-being, relative to peers who did not wish to change on these traits (Hudson & Fraley, 2016a). Findings that successful pursuit of personality changes goals is beneficial for well-being is consistent with more general personal goal research that has found successful goal pursuit to be associated with positive well-being outcomes (Diener et al., 1999; Koestner et al., 2002), making personality change goal research a worthwhile endeavor.

There have been efforts to explore potential mechanisms or interventions that may shed some light on the inconsistencies of previous research or to find strategies to increase the likelihood of desires to change resulting in actual subsequent trait change. For example, an experimental intervention that trained participants to link implementation plans, which are strategic plans that outline the steps of when and how to accomplish one's personal goals, with their trait change goals was shown to accelerate change (Hudson & Fraley, 2015). Another study found that change goals resulted in durable personality change only if individuals followed through on behavioral challenges, such as going to parties if one wanted to become more extraverted (Hudson et al., 2019). Nonetheless, the field of volitional personality change would benefit from further research aimed at shedding light on the process of volitional personality change.

Incorporating an understanding of theories of goal pursuit across the life span with how volitional personality change has been defined and operationalized in the literature may reveal a potential explanation for the mixed findings in the volitional personality change literature thus far. The way in which previous researchers have defined volitional personality change refers broadly to both desires and intentions to change personality traits. Theories of goal pursuit across the lifespan, such as the Rubicon Model of Action Phases and the Stages of Change Theory,

firmly delineate between goal-related desires and goal intentions, arguing that they are distinct phases in a dynamic goal action sequence that represent an important psychological shift that are associated with different cognitive, affective, and motivational experiences (Hechhausen, 1991; Heckhausen & Gollwitzer, 1987, Gollwitzer et al., 1990; Prochaska et al., 1993).

Within the Rubicon Model of Action Phases, "Crossing the Rubicon" has been used as a metaphor to describe the important psychological shift in mindset and psychological orientation that occurs as one shifts from a deliberative pre-actional goal phase where goal selection occurs, to an implemental phase where goal attainment and realization occurs (Gollwitzer & Achtiziger, 2008; Heckhausen et al., 2010). The Rubicon Model of action phases distinguishes between four phases of goal pursuit. First, there is the deliberative, pre-decisional phase where one is exploring the pros and cons of engaging in goal pursuit in a non-binding fashion. Between the first and second phase, there is a "Rubicon" transition where the individual forms an intention for goal pursuit and shifts to the second, pre-actional phase of goal pursuit, termed "planning", where the individual begins to develop concrete strategies for pursuing the selected goal. Next, there is another transition point where the individual begins to initiate action towards their goal as they shift into the third "action" phase of goal pursuit, where they begin enacting the steps required for goal pursuit. Finally, there is the evaluation, post-actional phase of goal pursuit, where the task is to evaluate the result of the actions taken towards their goal pursuits and how they compared to their initial goals and intention. In this last phase, the individual determines whether they successfully completed their goal and can deactivate their efforts, or whether more action is required. Before an individual has "crossed the Rubicon" and fully committed to their goal-pursuit, the individual has not fully committed to the goal and the goal may never become a

fully formed goal that the individual makes effort to realize (Gollwitzer & Achtiziger, 2008; Heckhausen et al., 2010).

The prominent "Stages of Change" theory, developed by Prochaska et al. (1993), posits that when someone is working towards making changes in their lives, there are six stages to progress through in order to achieve successful change. Moreover, similar to the action phases of goal pursuit, each state is associated with distinct motivational and cognitive processes. The first stage is the pre-contemplation stage where the individual is not currently considering change, where the individual may even be oblivious to change being needed. The second stage is the contemplation stage where the individual has begun to acknowledge that change is required or would be beneficial, but is ambivalent about change and has not yet reached the point of commitment towards change. Next, the third stage is the preparation/determination phase where the individual has determined that they would like to make the commitment to move towards change and are beginning to define and outline the steps required to achieve it. The fourth stage is action/willpower phase where the individual is motivated and actively working towards change. The fifth stage is the maintenance phase, which involves continued commitment to sustaining the progress and desired changes over time. The sixth, and final, stage is the relapse phase, where the person may resume old behaviours and regress on the progress they have made. In considering the difference between desires and intentions to change one's personality, desiring to change one's personality traits would be indicative of stage 2, contemplation, in which the individual does not have a fully formed goal or intention to move toward change. In contrast, at stage 3 (preparation) the individual has developed a more formal intention to engage in goal-directed behavior aimed at aligning themselves with their desired personality. From this

perspective, a key point is that making a true commitment to move towards change is essential for being able to make progress in creating change in your life (Prochaska et al., 1993).

As previously discussed, in order to assess whether an individual is pursuing volitional personality change, researchers adapted the anchors of the Big Five Inventory scale to instead ask individuals to respond to each of the trait-related adjectives about the extent to which they wanted to increase, stay the same, or decrease on each of the 44 Big Five Inventory trait term items (Hudson & Roberts, 2014). The potential risk with this approach is that by prompting participants with these trait-term items and asking if participants desire to change on each of these traits, researchers may be also be capturing participants who are answering in socially desirable ways, or indicating reactive, momentary desires to change, rather than true goal intentions (John & Srivastava, 1999). For example, being highly agreeable and emotionally stable are typically socially desirable traits, therefore, when individuals are asked whether they want to become more "warm and kind" and less "depressed, blue", the majority of people will likely indicate that they would ideally like to change in these ways, even if they do not currently have a fully formed goal to do so. This method of assessing whether individuals are pursuing personality change goals may be capturing individuals in the deliberative, pre-decisional phase of goal pursuit (according to the Rubicon Model of Action Phases) or the pre-contemplation/contemplation stages of change (from the Stages of Change theory), who are only passively weighing their non-binding wishes to change their personality traits. The issue is that it is only individuals who are in the planning and action phases of goal pursuit that have fully formed intentions that they are intending to work towards. The fact that two studies (Hudson et al., 2019; Hudson & Fraley 2015) have shown that volitional personality change was most likely to succeed when individuals linked their goal with specific behaviors, or with an implementation

plan, is consistent with the idea that the phase of the goal action cycle or stage of change may be highly relevant. Article 3 explores volitional personality change using methodology designed to increase the likelihood of capturing individuals who possess meaningful goal intentions to pursue change on the Big Five Traits.

Additionally, integrating Self-determination Theory's concept of the relative autonomy continuum with recent volitional personality research can shed light on an important motivational factor that would facilitate an individual making progress on their personality change goals and lead one's intentions to change into true, long-term trait change (Ryan & Deci, 2017). From the lens of the relative autonomy continuum, the following becomes an important question: Is volitional personality change truly "volitional"? In the volitional personality change research thus far, 'volitional' has been referring to the behaviour being "self- initiated", meaning that it is the individual who is intentionally striving towards change on the Big Five Traits. Integrating volitional personality change research with the relative autonomy continuum can shed light on whether self-initiated personality change is self-endorsed and autonomous, or external and controlled to the self. In other words, are people working towards personality change goals for controlled, external reasons, such to gain approval from others? Or are they working towards change for more autonomous, internal reasons, such as because it is important and meaningful to them and would help them live a life that is more in line with their values? Previous volitional personality change research has explored whether individuals have a desire to change their personality. However, by integrating Self-Determination Theory's concept of the relative autonomy continuum, we can explore the motivational dynamics leading individuals to select and pursue personality change goals, as well as how one's motivation relates to subsequent progress made on personality change goals. Being autonomously motivated to change one's

personality likely facilitates one's goal-related desires to change their personality to transform into true goal intentions. Moreover, seeing as research has consistently demonstrated that having more autonomous motivation is predictive successful goal pursuit, it is likely that having more autonomous motivation for one's personality change goals facilitates greater personality change goal progress (Holding et al., 2017; Koestner et al., 2006; Koestner et al., 2002; Koletzko et al., 2015; Sheldon & Elliot, 1998; Werner et al., 2016).

The Present Research

The overarching aim of the present work was to integrate Self-Determination Theory with theories of personality to enhance our understanding of the motivational dynamics involved in the expression of the Big Five traits when engaging in goal-directed behaviour. The present work lends evidence to Sheldon and Prentice's (2019) proposal that Self-Determination Theory could serve as a foundational framework for personality psychology because it can provide important conceptual tools for personality theory to understand positive change and development, and the role that individual differences in personality may play in goal-directed behaviour.

The first two articles included in this thesis explored the impact of the Big Five traits on the motivational dynamics associated with certain types of goal-directed behaviour and the subsequent progress made on these goals. More specifically, Article 1 investigates the role of the Big Five personality traits in the pursuit of agentic and communal personal goals. It was hypothesized that when individuals pursue goals that are more concordant with their personality traits, in other words, goals that better match their personality, they will feel more autonomous in their personal goal pursuits and they will achieve greater progress. For example, individuals high

on more socially-oriented traits (e.g., extraversion), may find pursuing communal goals more interesting and personally meaningful, which will be conducive to making greater progress on these goals. A parallel set of hypotheses can be made about how conscientious individuals may make greater progress when pursuing more achievement oriented goals (i.e., agentic goals).

Article 2 extended the personality-goal matching hypotheses of Article 1 to explore how the Big Five Traits related to the motivational dynamics involved in engaging in the goal-directed, health-promoting behaviours associated with social distancing during the global coronavirus pandemic. The pandemic presented the unique opportunity to test how Self-Determination Theory and the concordance between goal-directed behavior and personality could be tested on a large-scale goal that was shared by the population and that could benefit the state of public health at large. Research during the pandemic indicated adhering to social distancing measures as a key strategy for reducing the spread of the virus, resulting in lower numbers of new cases, hospitalizations, and deaths (Matrajt & Leung, 2020). However, there was great variation in how much individuals, or groups, agreed with and adhered to social distancing measures. Since adhering to social distancing measures can have a large impact on the spread of the virus, an important research endeavor would be to explore personality and motivational factors that may predict adherence to social distancing measures. It was hypothesized that the Big Five personality traits of agreeableness and conscientiousness, which promote collaboration and cooperation with others, would orient individuals toward more community aspirations and would predispose individuals to better internalize and feel more autonomously motivated to comply with the pandemic health recommendations.

The third article included in this work explored the influence of goal-directed behaviour on individual's Big Five traits over time. As previously mentioned, one's standing on the Big

Five Traits has important implications for one's well-being and ability to engage in goal-directed behaviour. However, what happens if people are unhappy with their personalities or their standing on the Big Five Traits is not conducive to making progress on their important and meaningful personal goals? Are people able to change their personality by setting a goal to do so or are they simply stuck as they are? This work builds upon recent research on the pursuit of personality change goals by using an alternate goal-assessment method that distinguishes desires to change from meaningful goal intentions. Self-Determination Theory's concept of the relative autonomy continuum was incorporated to enhance our understanding of whether volitional personality change is truly 'volitional' and how that relates to goal progress over time.

Article 1

A longitudinal investigation of trait-goal concordance on goal progress: The mediating role of autonomous goal motivation

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Article 1: Abstract

Objectives: The present study investigated the benefits of matching personality traits with goal type (i.e., agentic or communal) for goal progress. Autonomous motivation was examined as a mediator.

Methods: A multi-wave prospective longitudinal design was employed to track the progress that 935 university students made in their personal goal pursuits over an academic year. Participants set three personal goals at baseline and completed measures of personality and goal motivation. Participants' goals were coded as being either agentic or communal. Goal progress was assessed midyear (T2) and at the end of the academic year (T3). Goal motivation was reassessed midyear (T2).

Results: Conscientiousness was significantly related to making better progress on agentic, but not communal, goals. Conversely, extraversion was related to making communal, but not agentic, goal progress. These trait-goal matching effects on progress were partially mediated by goal-specific motivation, suggesting that the selection of goals that matched one's traits resulted in higher autonomous motivation at the start of the academic year.

Conclusions: The selection of trait concordant personal goals is associated with autonomous goal motivation and greater goal progress. This research integrates Self-Determination Theory with trait theories of personality to enhance our understanding of variations in goal success.

Keywords: big 5 personality traits, autonomous motivation, goal progress, Self-Determination Theory.

A longitudinal investigation of trait-goal concordance on goal progress: The mediating role of autonomous goal motivation

Individuals motivate themselves and give direction to their lives by setting and pursuing personal goals (Heckhausen, Wrosch & Schultz, 2010). While making progress at these goals typically results in heightened well-being, failing to make goal progress is associated with disappointment and lower well-being (Diener & Fujita, 1995). The present investigation aimed to understand variations in goal progress by exploring the extent to which individuals pursue personal goals that match their underlying personality traits. The central theoretical premise of Sheldon's (2014) self-concordance model is that the types of goals that people choose to pursue matter because goals that better reflect one's underlying traits, interests, values, and motives are more likely to be achieved and have a more positive impact on well-being (Ryan, Sheldon, Kasser & Deci 1996; Sheldon, 2014). By contrast, choosing the "wrong" goals to pursue, meaning those which are not self-concordant, can result in much wasted time and energy (Sheldon, 2014).

According to Sheldon's (2014) self-concordance model, one way to assess self-concordance is to analyze a person's goals in relation to other aspects of their personality, such as traits, values, motives, or self-narratives. The present investigation focused on investigating the concordance between the content of the personal goals that individuals pursue and their personality traits, which refer to consistencies in social-emotional functioning, and are thought to be best captured by the Big 5 trait taxonomy (John & Srivastava, 1999). Moreover, we proposed testing Sheldon's content-matching hypothesis between traits and goals with personal goals that were coded based on whether they were agentic or communal in nature. The distinction between agentic and communal motivational themes has a long history in personality psychology and has

previously been applied to the content of the personal goals that individuals select and pursue (Bakan, 1966; Emmons & McAdams, 1991; McAdams, Hoffman, Mansfield, & Day, 1996; Sheldon & Cooper, 2008). Agentic goals are those related to self-expansion, achievement, and mastery of the environment. Examples of agentic goals include *succeed in my studies* and *improve my fitness*. Communal goals are those related to creating, maintaining and/or improving interpersonal relationships. Examples of communal goals include *get along with my roommates* and *make new friends*. Sheldon & Cooper (2008) found evidence that making progress on agentic and communal goals is associated with enhanced well-being; therefore, understanding factors that are conducive to making progress on these types of goals is an important endeavor. The present study investigated which specific Big 5 traits are relevant and helpful in the pursuit of agentic and communal personal goals.

Although Sheldon's (2014) self-concordance model has focused predominantly on motives and goals, there is already evidence that matching the content of personal goals to one's dominant personality traits can be beneficial for one's well-being. For example, Sheldon and Tan (2007) asked participants to rate the alignment of their goals with their traits and reported evidence that personality-goal matching was significantly positively associated with subjective well-being. But which specific Big 5 traits are important in making progress in the pursuit of agentic and communal goals? Past research has found conscientiousness, defined as being efficient, organized, reliable and responsible, to be trait most consistently associated with successful goal pursuit (McCrae & Johnson, 1992; Roberts, Lejuez, Krueger, Richards, 2014). Research has also suggested that conscientiousness may be especially important for the pursuit of agentic goals, such as school or work performance over time, since these tasks likely require many of the qualities associated with conscientiousness (Judge & Ilies, 2002).

Although the nature of conscientiousness and the outcomes it is associated with might suggest it would be beneficial to all types of goal pursuit, McGregor, McAdams and Little (2006) hypothesized that high trait conscientiousness may be detrimental to the pursuit of social goals. Indeed, McGregor and colleagues (2006) noted that, for university students, academic and social goals are in constant tension with one another and that being high on trait conscientiousness would actually hinder an individual's social goal pursuits because such individuals may be less able to set aside their academic pursuits in order to pursue their social goals. The results supported McGregor et al.'s (2006) hypothesis that extraverted students would perceive their social goals as more manageable and were generally happier when pursuing such goals. However, McGregor et al. (2006) did not investigate whether personality-goal matching also translates into enhanced goal progress. In addition, this study did not investigate the specific role personality traits may have on other types of goal pursuit, such as pursuing agentic goals.

The links of personality traits to goal pursuit has recently been explored in Whole Trait Theory (Fleeson & Jayawickcreme, 2015), which offers a functional view of traits as tools for goal pursuit. In a series of studies, McCabe and Fleeson (2016) showed that momentary manifestations of conscientiousness and extraversion were explained by differences in goal pursuits. Thus, when participants were pursuing a time-efficiency goal, they enacted conscientious behaviors, whereas when they pursued a social dominance goal, they tended to behave in extraverted ways. This suggests that the traits of conscientiousness and extraversion are discriminatively associated with different types of goals (e.g., efficiency versus social goals). This implies that, in regards to personal goals that are typically framed over long periods of time and entail effortful persistence in the face of obstacles and action crises (Holding, Hope, Harvey, Marion Jetten & Koestner, 2016), it is likely that highly conscientious individuals will more

efficiently enact the specific behaviors required to accomplish agentic goals (e.g., exercising self-control, persisting in the face of obstacles). In contrast, highly extraverted individuals will more easily enact the specific behaviors required to accomplish communal goals (e.g., pursuing social interactions, expressing one's feelings to others). The Big 5 traits of openness to experience, agreeableness, and neuroticism might also relate to goal pursuits; however, the research reviewed above suggests that conscientiousness and extraversion are more likely to play a role.

Moreover, it has recently been suggested that the motivational processes that explain why people vary in their trait manifestations (and in their goal successes) can be explained by integrating Self-Determination Theory (SDT) with Whole Trait Theory (Prentice, Jayawickcreme, & Fleeson, 2019; Ryan & Deci, 2017). SDT is a macro-theory of motivation, personality and development which highlights the importance of exploring the volitional dynamics of behavior. More specifically, SDT introduced the concept of the relative autonomy continuum to explain the dynamics of motivational autonomy (RAC; Ryan & Connell, 1989). Sheldon and Prentice (2019) note that "according to this model, any and every motivated behavior, whatever its other attributes, can be located on a continuum ranging from controlled to autonomous." Furthermore, the authors noted that knowledge of the location on the continuum allows one to predict much about the way the person is likely to function, as well as the outcomes he or she can achieve. Relative autonomy is assessed by asking individuals to rate a variety of reasons for engaging in a behavior, ranging from reasons reflecting an internal locus of causality (e.g. personal interest or meaning) to those reflecting an external locus of causality (e.g., external or introjected pressures). The relative autonomy continuum captures whether a

goal is selected and pursued half-heartedly or whole-heartedly, with a sense of personal endorsement or with a sense of alienation.

Content-matching between personality traits and personal goals is likely to be associated with the relative autonomy of an individual's personal goals (Sheldon, 2014). Individuals whose goals match their traits are likely to have an internal perceived locus of causality for their goals, reflecting that they feel autonomous rather than controlled in their goal pursuits. Importantly, research has consistently shown that having more autonomous motivation for goal pursuits is associated with generation of goal-directed effort (Sheldon & Elliot, 1999; Werner, Milyavskaya, Foxen-Craft & Koestner, 2017), decreased goal ambivalence (Koletzko, Hermann, & Brandstatter, 2015), decreased action crises (Holding et al., 2016) and increased goal progress (Koestner et al., 2006; Koestner, Lekes, Powers & Chicoine, 2002).

A special issue of the Journal of Personality considered whether SDT can serve as a foundation for personality researchers. In support of this, Sheldon and Prentice (2019) argued that SDT provides important conceptual tools for personality theory to understand positive change and development, including change that results from pursuing personal goals. The Big 5 traits can predict broad trends in goal pursuit – conscientious individuals will generally pursue their goals more successfully - but SDT can help us understand the motivational processes by which traits have an impact on goal selection and goal pursuit. We sought to examine trait-goal matching and whether it conduces toward a motivational advantage that allows individuals to make progress on their goals over time.

The Present Study

The present study examined the role of the Big 5 personality traits in the pursuit of agentic and communal goals. In addition, goal motivation was investigated as a potential

mechanism underlying this relation. We hypothesized that when individuals pursue goals that match their personality traits, they feel more autonomous in their goal pursuits, and they achieve greater goal progress. For example, extraverted individuals pursuing a communal goal are expected to find pursuing this type of goal as more interesting and personally meaningful, leading them to engage in behaviors that are more conducive to communal goal progress, such as attending social events and interacting with others. A parallel set of processes would explain why conscientious individuals would make greater progress at agentic goals.

Our hypotheses were examined in the context of a multi-wave prospective study of university students that spanned an entire academic year (September to May). The time frame of an academic year represents a naturally occurring, developmentally significant, goal action sequence in which young adults are expected to generate and select their important goals for the year. The extent to which students select and commit to personal goals that match their traits should affect how efficiently they later navigate the challenge of sustaining goal pursuit over time (e.g., generating goal-related effort, shielding goals from conflicts and obstacles, weathering action crises). The motivational model of life span development (Heckhausen, Wrosch & Schulz, 2010; 2019) highlights the importance of the transition from the deliberative goal selection phase to the implemental goal pursuit phase of a goal action sequence. The authors of the model caution that it is not possible to strive for all goals at once (even sequentially) and that individuals must be selective about which goals they invest in. Matching the content of one's goals to one's predominant Big Five traits reflects a form of goal selectivity that may serve to optimize goal pursuit.

Although we expected that trait-goal matching would be associated with relatively more autonomous goal motivation at baseline, we were not sure whether dynamic effects would

emerge over the school year; this would be reflected by matching individuals becoming increasingly more autonomous, rather than controlled, in their motivation over course of the study. It is possible that the critical motivational advantage of matching traits with goals can only be seen directly during the selection phase of goal pursuit and its effects during the active goal pursuit phase would take the form of different motivational processes, such as by facilitating one's subjective ease of effort during goal pursuit.

Although our central hypotheses focused on the match between conscientiousness and agentic goals, and between extraversion and communal goals, we also explored possible goal matching effects for the other big 5 traits. Openness to experiences refers to the tendency to be receptive to new ideas, approaches, and experiences (McAdams, 2015). Because scoring high on openness to experience is related to self-awareness and the desire to explore new things, we expected it to fit better with agentic, rather than communal, goals. Agreeableness refers to the tendency to have concern for others and to have warm and trusting sentiments (McAdams, 2015). Because of established links with higher quality friendships and parenting, we expected it to fit better with communal, rather than agentic, goals (Jensen-Campbell, Knack, & Gomez, 2010). Neuroticism is defined as the tendency to experience negative emotions and we did not expect it to relate differentially to agentic or communal goals.

Method

Participants and procedure

935 university students were recruited to participate in a year-long 6-wave prospective goal study. 425 university students were recruited in the 2015-2016 academic year, with ages ranging from 17 to 37 (*Mean*= 20.2, *SD*= 2.32). 508 students were recruited (82.2% female) in

the 2016-2017 academic year, with ages ranging from 17 to 54 (*Mean*= 21.16, *SD*= 4.00). The samples were predominantly Caucasian (58%) and Asian (32%) in ethnicity. The retention rate over the school year was approximately 88% in the first year and 83% in the second. Missing data was handled by pair-wise deletion. The design of the study was identical across the two years.

Over the course of the study, participants completed a total of 6 online questionnaires via Qualtrics experimental software (Qualtrics, Inc. Salt Lake City, UT). Participants completed the first survey (T1) at the start of the academic year and were asked to identify three personal goals that they were currently pursuing. In addition, they completed measures of their personalities and goal specific motivation. Over the course of the academic year, five follow up surveys were sent to assess goal progress, as well as other personality and motivational factors. For the purpose of this paper, we focused on the baseline assessment, the midyear assessment, and the end of the school year assessment, due to these being the time points at which the variables of interest were assessed. We will refer to these assessments as baseline (T1), midyear (T2), and end-of-year (T3), though in reality they represented the first, third, and sixth waves of data collection.

The present study was conducted in compliance with the McGill University Research and Ethics boards. In addition, participants were financially compensated for their time. A previous article was published using some of this data (Holding et al., 2016) but that article, which focused on action crises and goal progress, did not examine the relation of Big 5 traits to the nature of the goals that were set.

Measures

Personal goals. Following the instructions outlined in Koestner et al. (2002), at T1, participants were prompted to report three personal goals that they would be pursuing over the

course of an academic year. A dozen examples of personal goals were provided to aid in goal generation and participants were told the list was not exhaustive and that they should list their own personal goals. Most of the examples provided were more agentic in nature, such as *I want to run my first half marathon this year*, *I want to get a 3.5 GPA this semester*, and *Act in a McGill drama production*. Three examples that were more communal in nature included: *Meet my boyfriend/girlfriend*, *Improve communication and increase intimacy with my romantic partner*, and *Skype with my parents once a week*.

Big 5 Personality traits. At T1, participants completed the 44-item Big Five Inventory (BFI) to assess their standing on the Big 5 Traits: conscientiousness, extraversion, neuroticism agreeableness, and openness to experience (John & Srivastava, 1999). Participants rated each item based on how much they agreed that the items reflected their own personality on a scale from 1 (meaning *strongly disagree*) to 5 (meaning *strongly agree*). An example of an item used to assess conscientiousness is *does things efficiently* and an example of an item to assess extraversion is *outgoing, sociable*. The reliability for all Big 5 traits were adequate, alphas > .80.

Goal coding. Participants' personal goals were coded as being either agentic or communal. Agentic goals were considered to be those related to self-expansion, self-improvement and reaching a certain standard in various domains, such as academic and career pursuits, improving mental and physical health and financial planning. Examples of goals coded as agentic are: *I would like to increase my fitness level* and *I want to get a 3.7 GPA this semester*. Communal goals were those related to creating, improving or maintaining interpersonal relationships. Examples of goals coded as communal are: *Improve the quality of my relationship with my romantic partner* and *I want to make more friends.*

Raters tried to *categorize* all goals as either agentic or communal. However, eight goals could not be coded because the definitions did not seem relevant. Examples of goals that were not coded are: *I want to read books for fun*, *cry less*, and *I'd like to do all of the 'touristy' Montreal things I was supposed to do before I graduate*. The interrater agreement between two raters was adequate, Cohen's Kappa = .83.

Goal Motivation. Goal motivation was assessed only at baseline, midyear and at the end of the year. Participants were asked to rate their motivation for pursuing each goal using five items that assessed external (*because somebody else wants you to* and *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 work on this*), identified (*Because it represents who you are and reflects what you value most in life*), integrated (*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 provided you—the primary reason is simply your interest in the experience itself*) reasons for goal pursuit (Sheldon & Kasser, 1998). All responses were made on a 7-point scale of 1 (*not at all for this reason*) to 7 (*completely for this reason*). The motivation scales were reliable: autonomous motivation, alpha = .81; controlled motivation alpha = .77.

As in previous research, autonomous motivation was calculated as the mean of intrinsic, integrated and, identified ratings, whereas controlled motivation was calculated as the mean of external and introjected regulation (Koestner, Lekes, Powers & Chicoine, 2008). Following Sheldon (2014), an index of goal relative autonomy was created by subtracting the mean of the controlled items from that of the autonomous items. This index is frequently used by SDT researchers (Ryan & Deci, 2017). Sheldon, Osin, Gordeeva, and Suchkov (2017) recently

provided new psychometric support for the relative autonomy index, confirming via a diverse set of statistical procedures that motivated behaviors can always be located on this continuum.

Moreover, we calculated separate goal motivation scores for participants' agentic goals and communal goals. If participants had only agentic goals, we calculated the mean motivation score across the three goals. If participants had two agentic goals and one communal we calculated the mean across the two agentic goals. If participants had two communal goals we calculated the mean across the two communal goals.

Goal progress. Goal progress was assessed at mid-year and at the end-of-the-year. Following Koestner, Powers, Carbonneau, Milyavskaya & Chua (2012), participants rated how much they agree with the following three statements: *I have made a lot of progress toward this goal*, *I feel like I am on track with my goal plan* and *I feel like I am achieving this goal*. The reliability of goal progress ratings was excellent, alphas > .90. Participants' responses were made on a 7-point scale with 1 corresponding to *strongly disagree* and 7 corresponding to *strongly agree*. Total goal progress was calculated as the mean of the midyear and end-of year assessments. We calculated progress separately across each participant's agentic goals and across their communal goals.

Aggregation across two types of goals. It is important to highlight that measures of motivation and progress were aggregated separately across agentic and communal goals so that we could compare the effects of extraversion and conscientiousness on thematically related types of goals. Recent research on motivation and goal progress typically have calculated these measures across a number of goals (e.g. Sheldon & Kasser, 1998; Koestner et al., 2012).

Results

Preliminary Analyses

Table 1 presents the means and standard deviations for all variables. Participants reported more than five times as many agentic goals as communal goals (2364 vs. 432). Indeed, only 397 of the 934 participants (43%) reported at least one goal that was coded as communal, whereas every participant reported at least one agentic goal. More specifically, cross-tabulations indicated that 536 participants reported only agentic goals, 358 participants reported two agentic goals and one communal goal, whereas 36 participants reported one agentic goal and two communal ones. Eight participants reported a goal that was deemed not codable as agentic or communal.

Table 2 presents the correlations among all the main variables included in the present study. Paired t-tests showed that participants reported somewhat greater goal progress (t (353) = -1.78, p =.083) for communal (Mean = 4.46; SD =1.54), rather than agentic (Mean = 4.30; SD =4.49), goals. Participants also reported relatively more autonomous motivation for their communal goals as compared to their agentic goals, both at T1 (t (353) = -9.05, p < .001) and T2 (t (338) = -8.46, p < .001). In addition, the goal progress measures for agency and communion were significantly positively related, r (353) = .17, p = .001. Moreover, conscientiousness and extraversion were significantly related to each other as well, r (354) = .15, p < .001.

Multiple regression analyses were conducted to examine the relations of the Big 5 traits to the number of agentic and communal goals that participants set. Specifically, the number of agentic and communal goals (ranging from 0-3) were regressed on the Big Five traits. Both analyses were not significant: for agentic goals, F (5, 926) = 1.33, p =.25, and for communal goals F (5, 926) = 1.28, p =.27. From these analyses we concluded that none of the Big Five traits were related to the actual number of agentic or communal goals that participants set.

An important note is that preliminary analyses indicated that gender was unrelated to the goal-related measures and, therefore, was not included in the main results reported below.

Main Results

Big Five Traits and General Goal Progress. To highlight the added value of distinguishing between agentic and communal goals, we first explored the relation of the big 5 traits to progress across both types of goals. The mean of goal progress from midyear and at the end of the year served as the dependent variable and the Big Five traits were entered as a set. The regression model was highly significant, multiple R = .27, F (5,865) = 15.58, p <.001. Only two of the traits emerged as significant individual predictors of general goal progress: Conscientiousness, β = .23, t (865) = 6.61, p < .001 and Extraversion, β = .08, t (865) = 2.24, p < .05. Thus, if one disregards the content of the goals, it would appear that conscientiousness is by far the strongest predictor of progress and that extraversion makes a significant secondary contribution. We hypothesized that aggregating across all types of goals masks important specific linkages between conscientiousness and extraversion with agentic and communal goals, respectively. Therefore, all subsequent analyses highlighted the distinction between agentic and communal goals thematically-aggregated indicators of goal motivation and progress.

Big Five Traits and Goal Progress for Agentic and Communal Goals. Multiple linear regression analyses on agentic and communal goal progress over the year were conducted in which the Big Five traits were entered as a set. The regression of agentic goals revealed a significant multiple R of .27 in goal progress, F (5, 863) = 13.70, p < .001. Table 3 provides the standardized regression coefficients for each of the Big Five traits. Only conscientiousness was significantly related to the amount of progress made on agentic goals over the year, β = .24. The regression of communal goals revealed a significant multiple R of.31 in communal goal

progress, F (5, 367) = 7.80, $p < .0001$. Only extraversion was significantly related to the amount of progress made on communal goals over the year, $\beta = .24$. Thus, participants made greater progress on agentic goals when they were higher on conscientiousness, whereas they made greater progress on communal goals when they were high on extraversion. Openness to experience, agreeableness and neuroticism were unrelated to progress on agentic and communal goals.

Goal Motivation by Big Five Traits. Multiple linear regression analyses on agentic and communal goal motivation at baseline were conducted in which the Big Five traits were entered as a set. The regression of agentic goals revealed a significant multiple R of .34 in goal autonomy, F (5, 926) = 24.75, $p < .001$. Table 4 provides the standardized regression coefficients for each of the Big 5 traits. Both conscientiousness, $\beta = .22$, and openness to experience, $\beta = .12$, were significantly positively related to relative autonomy for agentic goals, whereas neuroticism was significantly negatively related, $\beta = -.16$. The regression of communal goals revealed a significant multiple R of .29 for communal goal autonomy, F (5, 390) = 7.10, $p < .0001$. Extraversion, $\beta = .16$, and agreeableness, $\beta = .12$, were both significantly positively related to having more autonomous motivation for communal goals. Thus, as hypothesized, autonomy for agentic goals tended to be associated with conscientiousness and openness to experience, whereas autonomy for communal goals tended to be associated with extraversion and agreeableness. The relation of neuroticism to less agentic goal autonomy was unexpected. The relations of the big 5 traits to midyear reports of goal motivation will be explored in the following sections of the results.

Model-Testing: Conscientiousness and Extraversion. Structural equation modeling (SEM) using MPlus (Muthén & Muthén, 2012) was used to test our initial theoretical model (see

Figure 1). Specifically, it was hypothesized that conscientiousness would be positively related to agentic goal motivation at the beginning of the year, which in turn, was hypothesized to be positively associated with agentic goal motivation at mid-year. Subsequently, agentic goal motivation was hypothesized to be positively related to agentic goal progress at mid-year, which would in turn be positively associated with agentic goal progress at the end of the academic year. With regards to extraversion, it was hypothesized to be related to communal goal motivation at the beginning of the year, which would in turn be associated with communal goal motivation at mid-year. In turn, mid-year communal goal motivation was hypothesized to be positively related to mid-year communal goal progress, which in turn, was hypothesized to be positively associated to communal goal progress at the end of the academic year. No crossover effects were expected from either conscientiousness or extraversion on communal and agentic goal motivation and progress, respectively. To test these hypotheses (especially the crossover effects), the SEM analyses were conducted on the sub-sample of participants that had set both a communal and agentic goal at the beginning of the academic year; thus, these analyses were conducted on 355 participants (78% female).

Prior to the SEM analyses, data was checked for missing values and normality. Considering the small amount of missing data (i.e., 3.7%), the default robust full information maximum likelihood (FIML) algorithm available in Mplus 7.3 was used to impute the missing values. FIML has been deemed as a very reliable way of handling missing data when compared to other methods such as listwise deletion or simple imputation (Enders, 2010). Moreover, analyses were conducted to ensure that the participants who set both agentic and communal goals possessed similar characteristics from the rest of the participants in our sample with regards to age, gender, and personality traits. Results confirmed that our subsample of 355 participants did

not differ from the rest of the sample in trait conscientiousness and extraversion, or in goal motivation at baseline.

The SEM analysis was thus were performed using robust maximum likelihood estimation (MLR) procedures with MPLUS 7.3 (Muthén & Muthén, 2012). This method is preferable to others (such as ML) because it is robust to any potential deviations from normality. To test indirect effects, the bias-corrected bootstrap method (5000 samples with 95% bias - corrected confidence intervals [CIs]) using the maximum likelihood procedure (ML) was favoured because the MLR estimation does not offer bootstrapping. The following fit indices were thus given priority in model evaluation: the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR). According to Kline (2011) and Tabachnick and Fidell (2007), the CFI should be 0.95 or higher, while the RMSEA and SRMR should be 0.06 or lower for acceptable model fit.

Our theoretical model (see Figure 1) was first assessed. The model did not fit the data well: MLR χ^2 (df = 33, N = 355) = 100.953, p = .000, CFI= .892, RMSEA = .076 (.059, .093), SRMR = .084. Inspection of the modification indices (critical value: Δdf = 1, χ^2 = 3.84, p = .05) suggested the addition of direct links between conscientiousness and both T2 autonomous motivation for agentic goals and T2 progress on agentic goals, as well as direct links between extraversion and progress on communal goal at both T2 and T3. Moreover, the covariance links between agentic and communal goal progress at both T2 and T3 were not significant and thus removed from our final model. Overall, our final model (see Figure 2) fit the data adequately: MLR χ^2 (df = 30, N = 355) = 50.310, p = .012, CFI = .968, RMSEA = .044 (.021, .064), SRMR = .058[3]. In the following SEM models presented, the absence of paths indicates that those links were not included in the model.

All hypothesized paths were statistically significant at the $p < .05$ level and are displayed in Figure 2. Conscientiousness was positively related to agentic goal motivation at the beginning of the year, $\beta = .176$, $p = .001$. In addition to this hypothesized link, conscientiousness was also positively related to mid-year agentic goal motivation, $\beta = .107$, $p = .007$, and progress, $\beta = .244$, $p < .001$. Agentic goal motivation at the beginning of the year was positively related to agentic goal motivation at mid-year, $\beta = .670$, $p < .001$. In turn, mid-year agentic goal motivation was positively related to mid-year agentic goal progress, $\beta = .155$, $p = .003$, which then was positively associated with end-of-year goal progress, $\beta = .407$, $p < .001$. Results of indirect effects provided support for the mediating effect of agentic goal motivation (at T1 and T2) and mid-year goal progress (T2) in the relation between conscientiousness and end-of-year agentic goal progress (T3), $\beta = .007$, 95% CI [.002, .018].

With regards to extraversion, it was positively associated with communal goal motivation at the beginning of the academic year, $\beta = .174$, $p < .001$. In addition, extraversion was also positively related to communal goal progress, both at the midpoint, $\beta = .172$, $p < .001$, and the endpoint, $\beta = .177$, $p = .001$, of the academic year. Communal goal motivation at the beginning of the year was positively associated with communal goal motivation at mid-year, $\beta = .590$, $p < .001$. In turn, mid-year communal goal motivation was positively associated with mid-year communal goal progress, $\beta = .226$, $p < .001$, which was then positively related to end-of-year communal goal progress, $\beta = .469$, $p < .001$. Results of indirect effects supported the mediating role of communal goal motivation (at T1 and T2) and mid-year communal goal progress (T2) in the relation between extraversion and end-of-year communal goal progress (T3), $\beta = .011$, 95% CI [.004, .022].

Finally, no crossover effects between conscientiousness and extraversion with either communal and agentic goal motivation or progress, respectively, were observed. Overall, the proposed model fit the data adequately: MLR χ^2 (df = 30, N = 355) = 50.310, p = .012, CFI = .968, RMSEA = .044 (.021, .064), SRMR = .058.

Model-Testing: The Big-5. A second SEM was conducted with conscientiousness and extraversion with the addition of the traits of openness to experience, agreeableness, and neuroticism. These additional analyses were conducted to explore the effects of all Big Five traits on agentic and communal goal motivation and progress throughout the academic year. In addition to the specific effects of conscientiousness on agentic goals and of extraversion on communal goals, it was hypothesized that openness to experience would also be positively related to agentic goal motivation, while agreeableness would be positively associated with communal goal progress. No a priori hypotheses were formed with regards to neuroticism, as this personality trait was not expected to have a specific role for either agentic or communal goal motivation and progress. The same procedures as described for the first model were employed herein.

All hypothesized paths were statistically significant at the $p < .05$ level and are displayed in Figure 3. Results of this new model replicated those of our initial model with regards to the relations of goal-specificity of conscientiousness and extraversion on agentic and communal goal motivation and progress, respectively.

In addition to conscientiousness, openness was also positively related to agentic goal motivation at the beginning of the year, β = .109, p = .021. Results of indirect effects also supported the mediating role effect of agentic goal motivation (at T1 and T2) and mid-year goal progress (T2) in the relation between openness to experience and end-of-year agentic goal

progress (T3), β = .005, 95% CI [.001, .012]. Importantly, the indirect effects of conscientiousness on end-of-year agentic goal progress remained significant after including the other traits in the model β = .008, 95% CI [.002, .019].

In addition to extraversion, agreeableness was positively associated with communal goal motivation at the beginning of the year, β = .182, p < .001. Results of indirect effects also supported the mediating role effect of communal goal motivation (at T1 and T2) and mid-year goal progress (T2) in the relation between agreeableness and end-of-year communal goal progress at the end of the academic year (T3), β = .011, 95% CI [.005, .023]. Importantly, the indirect effects of extraversion on end-of-year communal goal progress remained significant after including the other traits in the model, β = .010, 95% CI = [.004, .020].

As in our initial model, no crossover effects were observed between either conscientiousness or openness to experience and communal goal motivation or progress. Such crossover effects were also not found between either extraversion or agreeableness and agentic goal motivation or progress. Overall, the proposed model fit the data adequately: MLR χ^2 (df = 52, N = 355) = 84.330, p = .003, CFI = .954, RMSEA = .042 (.024, .058), SRMR = .059.

Discussion

The present study examined the role of the Big Five personality traits in the pursuit of agentic and communal goals in the context of a multi-wave prospective study of university students over an academic year. We hypothesized that when individuals pursue goals that match their personality traits, they feel relatively more autonomous and are more likely to achieve progress. We hypothesized that the trait of conscientiousness would be linked with agentic goals that emphasize achievement and mastery, whereas the trait of extraversion would be linked with

communal goals that emphasize interpersonal relationships. Providing support for our trait-goal matching hypotheses, the relations of conscientiousness with progress on agentic goals, and of extraversion with progress on communal goals, were confirmed, as were links with goal-specific indicators of autonomous motivation. Structural equation modeling analyses highlighted the unique links between conscientiousness and agentic goal motivation, and between extraversion and communal goal motivation. There was no evidence of cross-over effects from conscientiousness to communal variables or extraversion to agentic variables. The model-testing also showed that midyear levels of goal motivation and goal progress were associated with baseline trait levels and that the midyear levels were associated with end of year goal progress. Together, these results support the hypothesis that the effects of conscientiousness and extraversion on goal progress depend on the specific content of the goal being pursued. When individuals select trait-concordant goals, they appear to feel more autonomous in their goal pursuit, which, in turn, leads to enhanced goal progress.

Interestingly, our results indicated that the specific effects of trait-goal matching on autonomous goal motivation for communal goals, but not agentic goals, were restricted to the goal selection phase of the goal action sequence. For communal goals, there was no evidence of an emergent, dynamic relation such that the trait-goal match resulted in significant increases in autonomous goal motivation from baseline, to midyear, and to the end of the year. We are unsure as to why trait-goal matching seemed to have a prolonged direct effect on agentic, but not communal goal motivation. One potential explanation may be that participants tended to already have more autonomous motivation for their communal goals in general; therefore, perhaps they may have had less room to become more autonomously motivated for their communal goals over time over time. That being said, there was evidence that baseline differences in autonomous

motivation appeared to facilitate making goal progress on both agentic and communal goals over the academic year via links with subjective ease of goal effort during the academic year[2]. This suggests a pathway from trait-goal matching, to autonomous goal motivation, to efficient goal pursuit, and ultimately, to greater goal success.

The main findings of the present study are original. The positive association of autonomous motivation and goal progress supports the SDT perspective of goal striving, but also adds an important theoretical wrinkle by highlighting the motivational benefits of trait-goal matching. Although previous research pointed to linkages of conscientiousness and extraversion with different types of goals (e.g., achievement versus social), no previous study has used a longitudinal design to test the hypothesis that matching these traits with goal content would result in significantly greater goal progress over time. Instead, previous research has focused on links with concurrent feelings of subjective satisfaction or well-being (e.g., McGregor et al., 2006)

Interestingly, two other Big 5 traits, openness to experience and agreeableness, also showed some evidence for trait-goal matching effects. More specifically, openness to experience, like conscientiousness, was significantly associated with agentic goal motivation. In addition, agreeableness, like extraversion, was significantly associated with communal goal motivation. Moreover, there was evidence that openness to experience indirectly affected agentic goal progress through its influence on agentic goal motivation, whereas agreeableness did the same for communal goals. Unlike conscientiousness and extraversion, however, there was no evidence of direct goal matching effects on progress for openness to experience and agreeableness.

The present study suggests that it is useful for goal researchers to distinguish between the agentic and communal nature of various goals. We were surprised that setting communal goals

was a relatively rare occurrence among university students, with the number of such socially-oriented goals being four times fewer than the number of agentic ones. Although, it is possible that a greater percentage of communal goals would have appeared if participants were asked to list a larger number of goals. Interestingly, despite their relatively infrequent selection, communal goals appeared to have some distinct advantages over agentic ones – students reported significantly higher levels of autonomous, rather than controlled, motivation and attained somewhat higher rates of success. Why did our university student participants not generate and pursue more of such goals? We would hypothesize the excessive achievement pressures of modern universities may induce many students to restrict their goal-setting efforts to specifically achievement related strivings.

Although conscientiousness and extraversion were shown to be importantly related to how participants pursued agentic and communal goals, there was no evidence that these Big Five traits were actually directly related to *choosing to pursue* more agentic or communal goals. Thus, conscientious individuals were just as likely as extraverted ones to select communal goals and extraverted individuals were just as likely as conscientious ones to select communal goals. Where the traits seemed to matter was in how individuals felt about pursuing the different types of goals and whether they were able to succeed at them. Stated differently, traits do not lead people to select a greater proportion of goals that match their trait; however, having chosen a goal that matches one's traits does seem to have a detectable motivational benefit – one perceives the goal as more interesting and personally meaningful.

We would hypothesize that other aspects of personality – such as motives and values – would be more directly related to the generation of agentic versus communal goals. Previous research by Emmons and McAdams (1991) suggests that the implicit motive for achievement is

significantly related to the number of agentic goals one generates, whereas the intimacy motive is associated with communal goals. We would hypothesize that motive-goal matching would yield similar motivational advantages to those we demonstrated for trait-goal synchrony.

As previously mentioned, the motivational model of life span development (Heckhausen et al., 2010; 2019) highlights the importance of the transition from the deliberative goal selection phase to the implemental goal pursuit phase of a goal action sequence. A limitation of the current study is that we did not systematically examine motivational processes that come to the fore during the goal implementation and pursuit stages of the goal action sequence. Future research should aim to explore how goal motivation relates to sustained engagement in goal pursuit and aim to clarify the mechanisms by which motivation influences goal progress. Previous research suggests that the relation of autonomous goal motivation to goal progress is mediated by motivational processes that make goal pursuit more efficient and resilient during later phases of goal pursuit – e.g., subjective ease of effort (Werner et al., 2016), reduced difficulty with distractions and temptations (Milyavskaya, Inzlicht, Hope & Koestner, 2015), and reduced action crises (Holding et al., 2016). We would expect that trait-goal matches, which result in greater autonomous motivation, would lead to more frequent and effective use of the positive goal pursuit strategies listed above. Indeed, in Footnote 2, we offer some initial evidence for this speculation in which we reported that baseline goal autonomy was significantly associated with subjective ease of effort midway through the first semester.

As is described in Figure 1, which illustrates our original theoretical model, we hypothesized a directional pathway in which goal motivation leads to greater concurrent goal progress for both agentic and communal goals. That being said, it is important to note that, based on our findings, we cannot fully rule out the possibility for the reverse directionality (i.e. making

more progress leads to more autonomous motivation). Indeed, Sheldon & Houser-Marko (2001) found that individuals having more autonomous motivation for their goals can lead to greater goal progress, and, subsequently, making greater goal progress, can lead individuals to be more autonomously motivated, creating an upward spiral. In Footnote 3, we describe having tested an alternative model in which we explored the inverted directional path of concurrent goal motivation and goal progress. This alternative model was less parsimonious and did not improve fit when compared to our Figure 2 model. This led us to be more confident in putting forward the model described in Figure 2 in this manuscript.

The present study successfully tested Sheldon's (2014) trait-goal matching model within a year-long prospective study tracking the personal goal progress of a large sample of university students. However, there are additional limitations to our study that should be noted. First, our sample was narrowly drawn from among university students at a highly competitive school. To enhance the generalizability of our findings, this research should be replicated within a community sample. Second, it should be acknowledged that, although the present research was prospective and longitudinal, we are unable to make firm conclusions based on causality. Third, the content of personal goals was coded in a simple, dichotomous manner. It is likely that coding goals for agency and communion separately using continuous scales would have allowed for more careful analysis of trait-goal matching effects. Future research should also consider having participants code the level of agency and communion of their own goals, a procedure that has been used for the coding of self-defining memories by Phillippe and colleagues (2013).

In addition, the implications of this research merit some consideration. Although the benefits of matching the content of one's goals was clearly demonstrated for the traits of conscientiousness and extraversion, it is possible that a different and more nuanced coding

system could have found goal-progress links for the other Big Five traits as well -- agreeableness, openness to experience, and emotional stability. It might also be useful to consider distinct facets of extraversion and conscientiousness in predicting progress on certain types of agentic or communal goals (e.g., social dominance and leadership tasks). For example, many researchers have found it useful to differentiate extraversion into two facets: social vitality and social dominance. It is plausible that different facets of extraversion may be more or less relevant for certain types of goal outcomes (e.g., a socially confident extraverted individual may perform better at a goal such as *improve my public speaking skills*, whereas a socially vital extraverted individual may perform better at a goal such as *meeting new people*).

Even though individuals low on conscientiousness and extraversion may find it generally more difficult to pursue agentic and communal goals, respectively, there is reason to believe that trait-goal mismatches can be overcome. Bryan Little's (2008) free trait theory suggests that in the context of certain important goals (e.g., graduating from university or finding a significant other), an individual may be able to stretch their personality in order to pursue goals that are not in line with their natural underlying personality; however, the experience of stretching one's personality may be draining and come at the price of their health and well-being (Bono & Vey, 2007; Little, 2008).

Conclusion

The present study provided empirical support for Sheldon's (2014) self-concordance model, highlighting the importance of matching one's personal goals to one's traits. Individuals who pursue more self-concordant goals (e.g., when more extraverted individuals pursue communal goals or more conscientious individuals pursue agentic goals) tend to benefit motivationally in terms of feeling more autonomous, which is predictive of more successful goal

pursuit. The present study integrated SDT with trait theories of personality to enhance our understanding of variations in goal success.

Declaration of conflicting interests

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Footnotes

[1] Goal-specific self-efficacy was assessed at baseline with the following single item: *To what extent do you feel you have the skills and resources necessary to attain this goal.* Participants rated their agreement with the previous item in relation to each of their three personal goals on a 7-point scale with 1 corresponding to *not at all* and 7 corresponding to *extremely.* There was evidence that conscientiousness was selectively associated with self-efficacy for agentic goals, whereas extraversion was selectively associated with self-efficacy for communal goals. We do not report these results in the main article due to goal-specific self-efficacy having been assessed with only a single item and only at a single time-point.

[2] Subjective ease of effort for pursuing each goal was also assessed in the middle of the first semester for the 2016-17 study. Following Werner et al. (2016), for each of their three personal goals, participants were asked about their subjective ease (*how easy and natural does it feel to engage in activities related to this goal?*) and feelings of laboriousness (*how laborious and taxing does it feel to engage in activities related to this goal?*). Participants rated their agreement with the previous items on a 7-point scale with 1 corresponding to *not at all* and 7 corresponding to *extremely.* Ratings for laboriousness were subtracted from ratings of ease to form an index of subjective ease of effort. Results revealed evidence that conscientiousness was selectively associated with subjective ease of effort for agentic goals, whereas extraversion was selectively associated with subjective ease of effort for communal goals. Moreover, there were significant positive links between goal motivation and ease of effort. We did not report these results in the main article due to subjective ease of effort ratings only having been collected for the 2016-2017 sample. Nonetheless, we do believe that self-concordant goal motivation may

have influence throughout the entire goal action sequence because it promotes adaptive goal pursuit processes.

[3] An alternative model, in which measures of goal motivation and goal progress for both agentic and communal goals at T2 were inverted (T1 trait → T1 goal motivation → T2 goal progress → T2 goal motivation → T3 goal progress), was also tested. This model provided acceptable fit to the data (MLR χ^2 (df = 28, N = 355) = 51.002, p = .005, CFI = .964, RMSEA = .048 (.026, .069), SRMR = .062). However, this alternative model did not represent an improvement over our original model, as it was less parsimonious and did not significantly improve model fit (ΔMLRχ^2 = -.567, Δdf = 2, p = .755; differences in scaled log likelihood were calculated using a publicly available online calculator: http://www.uoguelph.ca/~scolwell/lldifftest.html)

Article 1: References

Bakan, D. (1966). The duality of human existence: Isolation and communion in Western man. Boston: Beacon.

Bono, J. E., & Vey, M. A. (2007). Personality and emotional performance: Extraversion, neuroticism, and self-monitoring. *Journal of Occupational Health Psychology*, 12, 177–192.

Diener, E., Fujita, F. (1995) Resources, Personal Strivings, and Subjective Well-Being: A Nomothetic and Idiographic Approach. *Journal of Personality and Social Psychology*, 68, 926-935.

Emmons, R. A., & McAdams, D. P. (1991). Personal strivings and motive dispositions: Exploring the links. *Personality and Social Psychology Bulletin*, 17, 648-654

Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford Press.

Fleeson, W. & Jayawickreme, E. (2015). Whole Trait Theory. *Journal of Research in Personality,* 56, 82-92.

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological review*, 117, 32.

Heckhausen, J., Wrosch, C., Schulz, R. (2019). Agency and Motivation in Adulthood. *Annual Review of Psychology*, 70, 191-217.

Holding, A., Hope, N.H., Harvey, B., Marion Jetten, A.S., Koestner, R. (2016). Stuck in Limbo: Motivational Antecedents and Consequences of Experiencing Action Crises in Personal Goal Pursuit. *Journal of Personality*, 85, 893-905.

Jensen-Campbell, L. A., Knack, J. M., & Gomez, H. L. (2010). The psychology of nice people. *Social and Personality Psychology Compass*, 4, 1042-1056.

Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of applied psychology*, *87*, 797.

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research*, 2, 102–138.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.

Koestner, R., Horberg, E. J., Gaudreau, P., Powers, T., DiDio, P., Bryan, C., Salter, N. (2006). Bolstering implementation plans for long haul: The benefits of simultaneously boosting self-concordance or self-efficacy. *Personality and Social Psychology Bulletin,* 32, 1547–1558.

Koestner, R., Lekes, N., Powers, T. A., & Chicoine, E. (2002). Attaining Personal Goals: Self-concordance plus implementation intentions equals success. *Journal of Personality and Social Psychology*, 83, 231

Koestner, R., Otis, N., Powers, T., Pelletier, L., & Gagnon, H. (2008) Autonomous motivation, controlled motivation and goal progress. *Journal of Personality*, 76, 1201- 1230.

Koestner, R., Powers, T.A., Carbonneau, N., Milyavskaya, M., & Chua, S.N. (2012) Distinguishing autonomous and directive forms of goal support: Their effects on goal progress, relationship quality, and subjective well-being. *Personality and Social Psychology Bulletin*, 38, 1609-1620.

Koletzko, S. H., Herrmann, M., & Brandstatter, V. (2015). Unconflicted goal striving: Goal ambivalence as a mediator between goal self-concordance and well-being. *Personality and Social Psychology Bulletin*, 41, 140–156.

Little, B. (2008). Personal Projects and Free Traits: Personality and Motivation Reconsidered. *Journal of Social and Personality Psychology Compass,* 2, 1235-1254.

McAdams, D.P. (2015). The Art and Science of Personality Development. New York: NY, US: Guilford Press.

McAdams, D.P., Hoffman, B.J., Mansfield, E., Day, R. (1996). Themes of Agency and Communion in Significant Autobiographical Scenes. Journal of Personality, 64, 339-377. *Journal of Personality and Social Psychology*, 110, 287-301.

McCabe, K.O., & Fleeson, W. (2016). Are Traits Useful? Explaining Trait Manifestations as Tools in the Pursuit of Goals. *Journal of Personality and Social Psychology*, 110, 287-301.

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60, 175–215.

McGregor, I., McAdams, D.P., Little, B.R. (2006). Personal Projects, Life stories, and Happiness: On being true to traits. *Journal of Research in Personality*, 40, 551-572.

Milyavskaya, M., Inzlicht, M., Hope, N. & Koestner, R. (2015). Saying 'No' to temptation: 'want-to' motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology,* 109, 677-693.

Muthén, L. K., & Muthén, B. O. (2012). *MPlus. The comprehensive modeling program for applied researchers: User's guide* (5th ed.).

Philippe, F. L., Koestner, R., & Lekes, N. (2013). On the directive function of episodic memories

in people's lives: A look at romantic relationships. *Journal of Personality and Social Psychology*, 104, 164.

Prentice, M., Jayawickreme, E. & Fleeson, W. (2019). Integrating Whole Trait Theory and Self-Determination Theory. *Journal of Personality*, 87, 56-69.

Roberts, B.W., Lejuez, C., Krueger, R.F., Richards, J.M. (2014) What Is Conscientiousness and How can It be Assessed? *Developmental Psychology*, 50, 1315-1330.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749-761.

Ryan, R.M. & Deci, E.L. (2017) Self-determination theory: Basic psychological needs in motivation, development, and wellness. New York, NY, US: Guilford Press.

Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: The relation of goal content and regulatory styles to mental health. In J. A. Bargh & P. M. Gollwitzer (Eds.), The psychology of action: Linking cognition and motivation to behavior (pp. 7-26). New York, NY: Guilford Press.

Sheldon, K.M. (2014). Becoming Oneself: The Central Role of Self-Concordant Goal Selection. *Personality and Social Psychology Review*, 18: 349-365.

Sheldon, K.M., Cooper, M. (2008). Goal Striving within agentic and communal roles: Separate but functionally similar pathways to enhanced well-being. *Journal of Personality*, 76: 415-448.

Sheldon, K. M., & Elliot, A. J. (1998). Not all personal goals are personal: Comparing autonomous and controlled reasons as predictors of effort and attainment. *Personality*

and Social Psychology Bulletin, 24, 546–557.

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, 76, 482– 497.

Sheldon, K. M., & Houser-Marko, L. (2001). Self-concordance, goal attainment, and the pursuit of happiness: Can there be an upward spiral? *Journal of Personality and Social Psychology, 80*, 152-165.

Sheldon, K. M., & Kasser, T. (1998). Pursuing personal goals: Skills enable progress but not all progress is beneficial. *Personality and Social Psychology Bulletin*, 24, 1319-1331.

Sheldon, K.M., Osin, E.N., Gordeeva, T.O., Suchkov, D.D., Sychev, O.A. (2017). Evaluating the Dimensionality of Self-Determination Theory's Relative Autonomy Continuum. *Personality and Social Psychology Bulletin*, 43, 1215-1238.

Sheldon, K.M., Prentice, M. (2019). Self-Determination Theory as a foundation for personality researchers. *Journal of Personality*, 87, 5-14.

Sheldon, K. M., & Tan, H. (2007). The multiple determination of well-being: Independent effects of positive needs, traits, goals, selves, social supports, and cultural contexts. *Journal of Happiness Studies*, 8, 565-592.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). New York: Allyn & Bacon.

Werner, K.M., Milyavskaya, M., Foxen-Craft, E., Koestner, R. (2016). Some goals just feel

easier: Self-Concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences*, 96, 237-242.

Article 1: Tables and Figures

Table 1

Key Variable Characteristics

	Mean (Standard Deviation)
Conscientiousness (n = 932)	3.52 (.68)
Extraversion (n = 932)	3.24 (.87)
Neuroticism (n = 932)	3.17 (.84)
Openness to experience (n = 932)	3.68 (.62)
Agreeableness (n = 932)	3.75 (.65)
Agency Goal Progress midyear (n = 839)	4.08 (1.17)
Communal Goal Progress midyear (n = 354)	4.34 (1.60)
Agency goal progress end of year (n = 861)	4.63 (1.45)
Communal goal progress end of year (n = 347)	4.76 (1.77)
Aut. motivation for agentic goals baseline (n = 932)	1.98 (1.63)
Aut. motivation for communal goals baseline (n = 396)	2.88 (1.95)
Aut. Motivation for agentic goals midyear (n = 832)	1.65 (1.76)
Aut Motivation for communal goals midyear (n = 339).	2.50 (1.87)

Note. Aut. =Autonomous.

Table 2

Correlations among main variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Conscientiousness												
2. Extraversion	.15**											
3. Neuroticism	-.22**	-.25**										
4. Openness	.03	.19**	-.05									
5. Agreeableness	.21**	.12**	-.21**	.10**								
6. T2 Agency GP	.24**	.08*	-.10*	-.01	.08*							
7. T2 Communal GP	.14**	.21**	-.09	.14*	.05	.11*						
8. T3 Agency GP	.22**	.04	-.11**	-.04	.08*	.41**	.17**					
9. T3 Communal GP	.07	.27**	-.15**	.02	.10	.11	.49**	.14**				
10. T1Autonomous AG	.27**	.14*	-.23**	.14**	.10*	.15*	.05	.10**	.11			
11. T1 Autonomous CG	.16**	.21**	-.10	.13**	.17**	.00	.13*	-.03	.19**	.26**		
12. T2 Autonomous AG	.25**	.11*	-.25**	.13**	.16**	.21**	.06	.09*	.07	.67**	.21**	
13. T2 Autonomous CG	.22**	.15	-.13*	.14**	.17**	.07	.25**	.06	.24**	.24**	.59**	.29*

Note. * $p < .01$; ** $p < .001$; AG = Agentic Goal; CG = Communal Goal; GP = Goal Progress; T1=Baseline assessment; T2=Midyear assessment; T3= End of year assessment

Table 3

Summary of the Linear Multiple Regression Analyses for Predicting Agentic and Communal Goal Progress with the Big 5 traits.

Variable	Agency Goal Progress			Communal Goal Progress		
	B	SE *b*	β	B	SE *b*	β
Conscientiousness	.41	.06	.24***	.13	.11	.06
Extraversion	.03	.05	.03	.41	.09	.24***
Neuroticism	-.08	.05	-.06	-.14	.10	-.08
Openness to experience	-.08	.06	-.04	.21	.12	.08
Agreeableness	.03	.06	.02	.06	.12	.03

Note. * $p < .01$; ** $p < .001$, *** $p < .0001$.

Table 4

Summary of the Multiple Linear Regression Analyses for Predicting Agentic and Communal Goal Autonomous Motivation at Baseline with the Big 5 traits.

	Agency Goal Autonomous Motivation			Communal Goal Autonomous Motivation		
Variable	B	SE *b*	β	B	SE *b*	β
Conscientiousness	.53	.07	.22**	.26	.14	.10
Extraversion	.09	.06	.05	.35	.11	.16**
Neuroticism	-.31	.06	-.16**	-.04	.12	-.02
Openness to experience	.31	.08	.12**	.29	.15	.09
Agreeableness	.01	.08	.01	.35	.15	.12*

Note. * $p < .01$; ** $p < .001$, *** $p < .0001$

Figure 1

Original theoretical model involving conscientiousness and extraversion with agentic and communal goal motivation and progress, respectively.

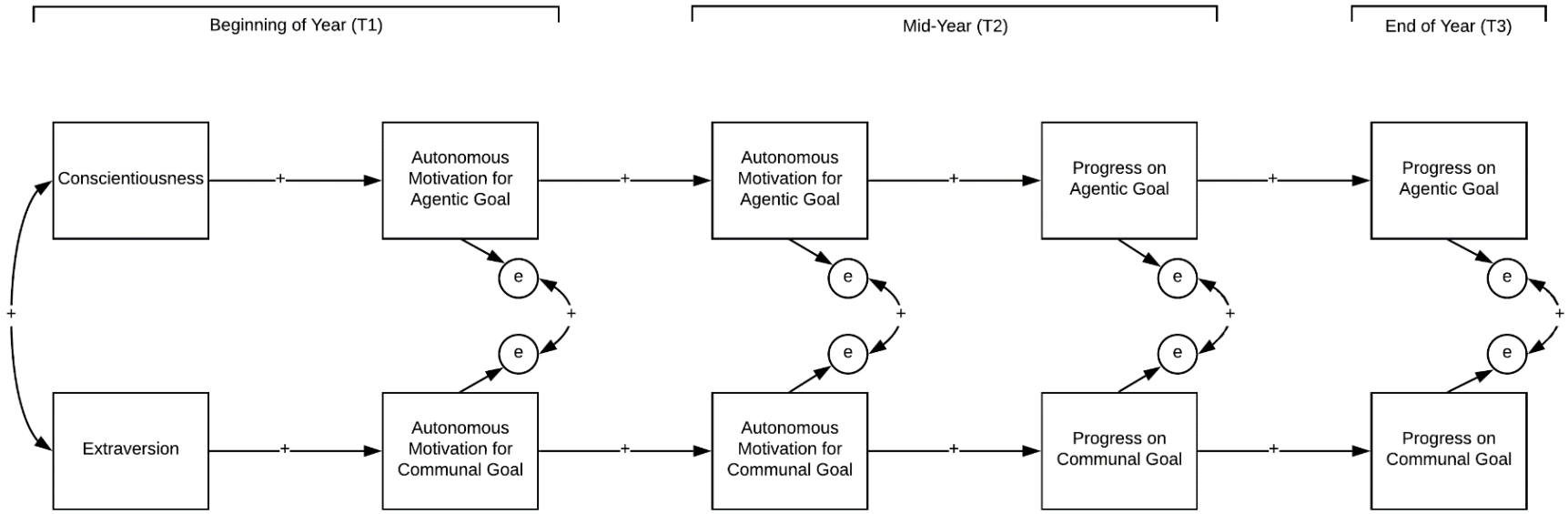
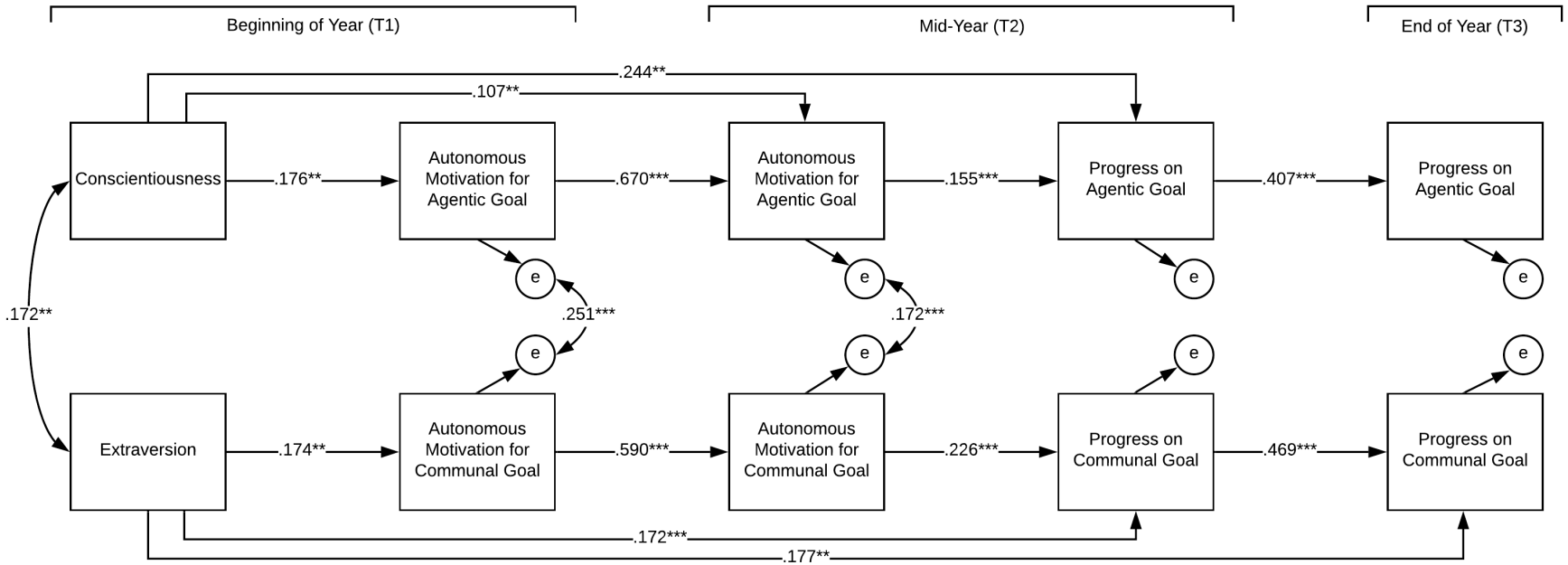


Figure 2

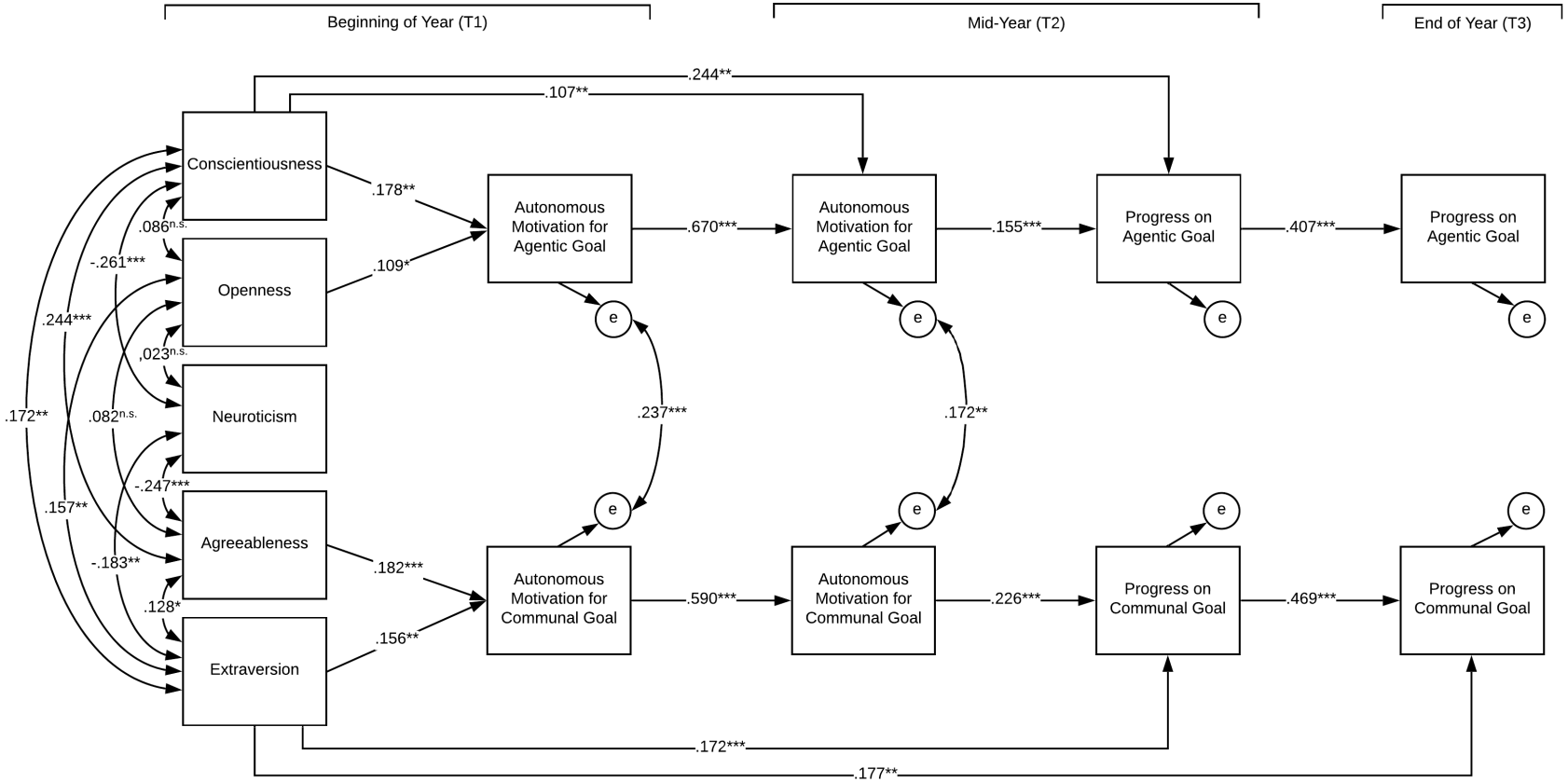
Final model of the relationship involving conscientiousness and extraversion with agentic and communal goal motivation and progress, respectively.



Note. All significant paths and covariances are shown in the model; * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 3

Final model of the relationship involving all traits from the Big-Five with agentic and communal goal motivation and progress.



Note. All significant paths and covariances are shown in the model; Covariances were also specified for each of the Big 5 traits;$^{n.s.}$ = non-significant; * $p < .05$, ** $p < .01$, *** $p < .001$.

Bridge to Article 2

Article 1 tested Sheldon's (2014) self-concordance model by exploring the influence of dispositional traits at the first level of personality on one's personal goals at the second level of personality. It was hypothesized that pursuing personal goals that are optimally supported by one's underlying personality traits would result in a motivational advantage that would translate into greater goal progress. The results of Article 1 found evidence that being highly conscientious is predictive of a greater autonomous motivation for and goal progress made on agentic goals, which emphasize achievement and mastery. In contrast, being more extraverted is predictive of greater autonomous motivation for and goal progress made on communal goals, which emphasize interpersonal relationships. These results provide evidence that the influence of conscientiousness and extraversion on goal progress is dependent on the specific type of goal being pursued. When individuals select trait-concordant goals, they appear to feel more autonomous in their goal pursuit, which, in turn, leads to enhanced goal progress.

Article 2 extends the exploration of the personality-goal matching hypothesis within a highly relevant, real-world context. Indeed, Article 2 explores how the Big Five Traits related to the motivational dynamics involved in engaging in the potentially lifesaving, goal-directed behaviours associated with social distancing during the global coronavirus pandemic. A large part of the need to adhere to the social distancing guidelines was to slow the spread of the virus to protect those in our communities who were most vulnerable and at risk of experiencing serious health complications (e.g., individuals with immune-suppressive diseases). Therefore, it was hypothesized that individual personality differences that promote collaboration and cooperation with others, such as conscientiousness and agreeableness, would likely be more

concordant and provide the necessary tools for the goal-directed behaviour of social distancing and would lead to a motivational advantage.

Article 2

Agreeableness and Conscientiousness promote successful adaptation to the Covid-19 pandemic through effective internalization of public health guidelines.

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Article 2: Abstract

Social distancing (SD) was an effective way of reducing virus transmission during the deadly and highly infectious COVID-19 pandemic. Using a prospective longitudinal design, the present study explored how the Big 5 traits relate to variations in SD in a sample of university students (n= 285), and replicated these findings using informant reports. Self-determination theory's concepts of autonomous motivation and intrinsic community values were explored as potential mechanisms linking traits to SD. Individuals who were higher on trait agreeableness and conscientiousness engaged in more SD because they more effectively internalized the importance and value of the guidelines as a function of their concerns about the welfare of their communities. Informant reports confirmed trait agreeableness and conscientiousness to be associated with more SD. These results enhance our understanding of individual differences associated with better internalization and adherence to public health guidelines and can inform future interventions in similar crises.

Keywords: Big 5 personality traits, self-determination theory, COVID-19 pandemic, social distancing, informant reports.

Agreeableness and Conscientiousness promote successful adaptation to the Covid-19 pandemic through effective internalization of public health guidelines.

The global COVID-19 pandemic, which at the time of writing this article has infected over 455 million people and claimed over 6 million lives worldwide, has led many governments to recommend that their citizens make behavioural changes to reduce the spread of the virus. In others words, people all over the world have been encouraged to adopt the "emergency goal" of social distancing, which involves making changes in our everyday routines in order to minimize close contact with others, such as avoiding crowded places and non-essential gatherings, limiting contact with people outside one's household, keeping a distance of at least 2 arms lengths from others, and wearing a mask (when keeping 2 meter distances from others is not possible). Research suggests that adhering to social distancing measures is effective in reducing the spread of the virus, resulting in lower numbers of new cases, hospitalizations, and deaths (Matrajt & Leung, 2020). While research suggests that social distancing is effective at flattening the curve, potentially saving the lives of hundreds of thousands of individuals, there is variation in how much individuals, or groups, agree with and adhere to social distancing measures. Since adhering to social distancing measures can have a large impact on the spread of the virus, an important research endeavor would be to explore personality and motivational factors that may predict adherence to social distancing measures.

A key factor that could be predictive of an individual's likelihood of engaging in social distancing is the quality of their motivation. According to self-determination theory, the value and importance of an activity, such as social distancing, can be internalized for autonomous or controlled reasons (Ryan & Deci, 2017). Relatively more internalized purpose or rationale for behaviour is considered to be more autonomously motivated and the behaviour is seen by the actor as self-generated and pursued whole-heartedly because the individual "wants to" (Ryan &

Deci, 2017). Within the context of the pandemic, this would mean the individual would engage in social distancing because they "want to" and have internalized the idea that it is an important and meaningful practice. In contrast, an individual is considered to have controlled motivation for a behaviours when its purpose or rationale is only partially internalized and the individual tends to feel alienated from its pursuit and will only pursue it because they "have to" (Ryan & Deci, 2017). In this case, individuals would feel guilty or anxious if they did not practice social distancing or would do so only in anticipation of external consequences (e.g., disapproval of others). Several decades of research has found that pursuing goal-directed behaviour for autonomous, rather than controlled, reasons is predictive of more sustained effort and goal progress (e.g., Koestner, 2008; Koestner et al., 2008; Milyavskaya et al., 2015; Moore et al., 2019; Ryan & Deci, 2017). The present study hypothesized that autonomous motivation for complying to the COVID-19 pandemic social distancing heath guidelines would be predictive of the extent to which individuals adhered to the guidelines.

Autonomous motivation is often mistaken as being synonymous with independence. Autonomous motivation is a highly personal form of motivation that highlights one's desires and freedom of choice. However, recent research has found that autonomous motivation is a highly collaborative process and that dispositional characteristics that orient people towards cooperativeness with others is associated with an upward spiral of their autonomous motivation and progress in their goal-directed behaviours (Levine et al., 2020; Levine et al., 2021). In the present study, we hypothesized that certain personality characteristics that promote collaboration and cooperation with others would predispose an individual to better internalize and feel more autonomously motivated to adhere to the COVID-19 public health recommendations.

McAdams' (2015) 3-tier model of personality suggests how personality characteristics may be related to adhering to guidelines. The first level of personality comprises one's dispositional traits. Broadly speaking, personality traits are consistencies in social-emotional functioning, and are thought to be best captured by the Big 5 trait taxonomy: agreeableness, conscientiousness, extraversion, openness to experience and neuroticism (John & Srivastava, 1999). The second level is one's personal concerns (i.e. one's personal goals, projects, aspirations, and values). The third level of personality comprises an individual's life narrative, which is essential for identity formation. While this third level could be relevant to the adherence and internalization of social distancing measures, it is outside the scope of the present study. Indeed, the present study will primarily focus on the first two levels of personality and explore how traits and values, in the form of self-determination theory's community values (i.e. valuing helping those in your community and working towards the betterment of society), may relate to the internalization of the importance (i.e. autonomous motivation) of and actual adherence to social distancing measures. Since socially distancing within the context of the pandemic is to protect those in our communities who are most at risk, our hypothesis was that certain traits that orient people toward having greater concern for their community will be associated with greater autonomous motivation for and actual adherence to the social distancing guidelines. Oosterhoff et al. (2020) found that a sense of social responsibility and concerns over others becoming ill were the primary motivations endorsed by adolescents who engaged in social distancing, however, they did not explore the quality of this motivation (i.e. whether it is autonomous or controlled) nor the personality traits that would predispose someone to have these motivations.

Considering which of the Big 5 traits would orient an individual towards collaboration and therefore greater internalization of the COVID-19 pandemic protective health measures,

agreeableness seems a likely candidate, and there is already emerging evidence to support this hypothesis (Zajenkowski et al., 2020). Individuals high on agreeableness are thought to be warm, friendly, and have a tendency toward pro-social behaviour. The data appear to show that the death rates for COVID-19 pandemic increase with age and with the presence of pre-existing conditions (Onder et al., 2020). This means that for younger individuals, such as the young adult participants who were recruited in the present study, a large part of the rationale for social distancing would be to care for and protect others in their community. As McAdams (2015) asserts, "*agreeable people are more than nice. Agreeableness incorporates expressive qualities of love and empathy, friendliness, cooperation and care… [agreeableness] includes such concepts as altruism, affection and many of the most admirably humane aspects of the human personality*". Therefore, we hypothesized that high agreeableness would predispose an individual to care about the impact of the COVID-19 pandemic on others and to want to do their part to protect their communities by social distancing. More specifically, we hypothesized a path in which agreeableness is associated with greater concern for their community, leading to greater autonomous motivation for adhering to social distancing guidelines, which is subsequently associated with greater adherence.

Supporting our hypothesis, a recent study on the Big 5 traits and adherence to COVID-19 pandemic social distancing guidelines found agreeableness to be the only Big 5 trait associated with adhering to social distancing measures (Zajenkowski et al., 2020). One of the aims of the present study was to replicate and extend these findings using a longitudinal design by exploring whether an individual's community values and level of internalization of the COVID-19 public health guidelines mediate the relation between the Big 5 traits and adherence to the social distancing guidelines. Moreover, we also aimed to replicate the findings linking traits to social

distancing by using friend and family informant reports of participants' personality and their perceptions of how much participants socially distanced.

Intuitively, conscientiousness, defined as being efficient, organized, dutiful, reliable and responsible, seems like a Big 5 trait that would be plausibly associated with being effective at adhering to public health guidelines aimed at reducing the spread of the virus (McCrae & Costa, 1987). Indeed, adhering to public health guidelines requires behaviours such as being vigilant at hand washing, wearing a mask and maintaining a 2-meter distance from those around you whenever possible. It requires you to remain responsible and limit contact with others outside of your household and not engage in non-essential travel - no matter how temping it might be! These are all behaviours for which being a highly conscientious person would likely be quite helpful. Even prior to the pandemic, a meta-analysis found conscientiousness to be positively associated with health promoting behaviours, such as diet and exercise, and negatively associated with risky health-related behaviours, such smoking and alcohol use (Bogg & Roberts, 2004). Furthermore, Ai et al. (2019) found that conscientious individuals tend to visit relatively fewer places in a day. Taken together, these findings suggest that social distancing, which is essentially a health promoting behaviour, is consistent with behaviours that conscientious individuals were already engaging in prior to the COVID-19 pandemic. Moreover, according to Sheldon's (2014) self-concordance model, when an individual engages in goal-directed behaviour (such as social distancing) that is more reflective of and is better supported by one's underlying traits, interests, values, and motives, the individual will tend to feel more autonomous and be more likely to persist (Moore et. al, 2020; Ryan, Sheldon et al., 1996). Therefore, we hypothesized that the trait of conscientiousness would be concordant with engaging in social distancing and will therefore

be associated with greater autonomous motivation for and engagement in social distancing behaviours.

Besides trait conscientiousness being concordant with engaging in social distancing, would conscientiousness also predispose an individual to value their community? McAdams (2015) discusses how, even though agreeableness and conscientiousness are different traits, they do tend to be associated with similar important life outcomes, such as positive relationship outcomes and prosocial behaviours (Graziano & Eisenberg, 1997; McAdams, 2015; Noftle & Shaver, 2006; Swickert et al., 2014). In addition, both agreeableness and conscientiousness are thought to develop out of the same developmental precursor – effortful control. Effortful control is a child temperament factor that consists of behaviours related to focusing attention and withstanding impulses so as to respond adaptively to situational demands (Li-Grining, 2007). Effortful control is thought to lead to the development of our "moral conscience" and is associated with key moral emotions such as empathy and a sense of moral responsibility – factors that would seem necessary for one to have a deep concern for the health and well-being of one's communities (McAdams, 2015; Rueda, 2012). A concern that would likely lead one to social distance during the COVID-19 pandemic. Therefore, while we previously discussed a pathway from conscientiousness to social distancing through autonomous motivation due to the concordance of social distancing with trait conscientiousness, we would also hypothesize a similar pathway to the one outlined for agreeableness through their community values.

The present study

As evidenced by the large gatherings that took place during periods of confinement and by the anti-mask protests that have been reported in the media, there are variations in how much people have been willing to adhere to the recommended social distancing measures during the

COVID-19 pandemic. The present study sought to explore the associations between personality and motivational factors and the extent to which individuals adhere to social distancing measures during the first wave of the pandemic. We hypothesized that individuals who were more autonomously motivated to social distance and those who highly valued supporting their community would be more likely to socially distance. In addition, we hypothesized that the Big 5 personality traits of Agreeableness and Conscientiousness, which promote collaboration and cooperation with others, would orient individuals toward more community aspirations and would predispose individuals to better internalize and feel more autonomously motivated to comply with the COVID-19 health recommendations. Finally, we hypothesized that autonomous motivation for adhering to social distancing health guidelines and intrinsic community values would mediate the association between the personality traits and greater adherence. A methodological strength of the current investigation was that, in order to address the limitation of participant self-report bias, we also linked traits to social distancing using assessments of participants' personality and social distancing behaviours via friend and family informant reports.

Methods

Participants and Procedure

285 university students (83.2% female), aged 18 to 53 years (Mean = 20.7, SD = 3.80), were recruited to participate in a large 6-wave prospective study on personal goals and well-being. We aimed to recruit upwards of 250 participants in order to ensure enough power to detect small effects 80% of the time. When conducting a path analysis, the literature suggests a minimum sample of 200 (Kline, 2011). Overall, 47.4% of participants reported they were *White*, 38.6% reported *Asian*, 5.6% *Middle eastern*/*Arab Canadian*, 4.6% *Latino-Hispanic*, 3.5%

Black/African, and less than 1% *Native/First Nations*. More than 80% of participants were retained across surveys.

Due to the focus of the present study being on the COVID-19 pandemic, only measures assessed at baseline (T1) and mid-second semester (T5) were relevant for consideration as it was at these time points that the variables of interest were assessed. Over the course of the study, participants completed online questionnaires via Qualtrics experimental software (Qualtrics, Inc. Salt Lake City, UT). Participants completed the first survey (T1) at the start of the academic year and completed baseline measures of their personality and community-oriented values. Approximately 6 months later, the COVID-19 pandemic became increasingly prominent in Canada, requiring classes to go online and an ethics amendment was submitted and approved by the institutional Internal Review Board for the addition of items related to the COVID-19 pandemic to this study. At T5, participant's motivation for and the extent to which they adhered to social distancing measures was assessed. The retention rate from T1 to T5 was 81.3%. One-way ANOVAs revealed that participants who were lost to attrition tended to be less conscientious ($F(1, 282) = 5.91$, $p = .02$), however, no differences were found in their age, gender and their standing on the rest of the Big 5 traits.

All data are available on OSF (https://osf.io/km8e5/?view_only=b60b5e1e11c048b999b74db49b922db6). The present study was conducted in compliance with the McGill Research and Ethics boards and participants were financially compensated up to $50.00 in cash or a gift card for their time depending on the number of surveys they completed as part of this study.

Informant Data and Procedure

At baseline, participants were asked to voluntarily nominate and provide the E-mail of a friend and family member that could be contacted via E-mail to complete two brief 5-10 minute surveys via Qualtrics experimental software (Qualtrics, Inc. Salt Lake City, UT). The informants completed one baseline survey at the start of the academic year, and a second 9 months later at the end of the study. At baseline, the informants perceptions of the participant's personality was assessed. In the second survey, the informants were asked the extent to which they perceive the participant to be adhering to social distancing measures. 94.0% (268) of participants nominated a friend informant that could be contacted to complete an informant survey, and 94.7% (270) of participants nominated a family member informant. 75% of the nominated family members completed the baseline assessment and 55.2% completed the second end-of-study assessment. 75.9% of the nominated friends completed the baseline assessment and 54.8% completed the second end-of-study assessment.

Measures

Big 5 Personality traits. The participants' standing on the Big 5 Traits (conscientiousness, extraversion, neuroticism, agreeableness, and openness to experiences) was assessed at baseline using the 44-item Big Five Inventory (BFI; John & Srivastava, 1999). Participants responded to the prompt *I am someone who…* and rated each item based on how much they agreed that the items reflected their own personality on a scale from 1 (meaning *strongly disagree*) to 5 (meaning *strongly agree*). An example of an item used to assess conscientiousness is *does things efficiently* and an example of an item to assess extraversion is *outgoing, sociable*. Mean scores were calculated for each trait subscale and the reliability for all Big 5 traits were adequate (alphas > .74).

Informant perceptions of participants Big 5 traits. To assess the participant's nominated friend and family member's perceptions of the participant's Big 5 traits, each friend and family member also completed the BFI with an adapted prompt that said *[insert participant name] is someone who…*

Adherence to social distancing. To assess the extent to which participants complied with public health recommendations to socially distance, participants rated and a mean was calculated from the following two items on a scale from 1 (meaning *not at all*) to 7 (meaning *completely*): *How much are you currently following the recommendations to stay home as much as possible*? and *To what extent have you adopted the goal of social distancing*?

Informant perceptions of social distancing adherence. To assess the extent to which informants perceive participants to have complied with social distancing guidelines, participants rated the following item on a scale from 1 (meaning *not at all*) to 7 (meaning *completely*): *How much is [insert participant name] currently following the recommendations to stay home as much as possible?*

Motivation for social distancing. To assess participant's motivation for adhering to social distancing measures, they completed a 7-item adapted version of the motivation measure used in Soenens, Vansteenkiste, Nemiec (2009). The following items were used to assess participant's autonomous motivation for social distancing (Cronbach's alpha =.75): *The recommendations reflect my values*, *I find these recommendations meaningful*, *I understand why these recommendations are important*. The following items assessed participant's controlled motivation (Cronbach's alpha =.84): *I would feel guilty if I did not follow the recommendations*, *I feel pressured to do so*, *I don't want to get criticized for not following the recommendations*,

Others would disapprove of me. Participants rated each item on a scale from 1 (meaning *not at all true of me*) to 7 (meaning *very true of me*).

Community Aspirations. In order to assess participant's intrinsic community aspirations, a subscale of the shortened 12-item version of Kasser & Ryan's (1996) Aspiration Index was used. Note that this shortened version on the Aspiration Index has been used in past studies (e.g., Hope et al., 2016; 2019). On a scale from 1 (*not all that important*) to 7 (*very important*), participants responded to the following two items to assess their community aspiration: *To work for the betterment of society* and *To assist people who need it, asking nothing in return*.

Results

Primary analyses

Table 1 presents the means, standard deviations and correlations among the key variables used in this study. Importantly, in terms of building our later path analysis model that tested the mediational role of autonomous motivation and community values in the relation between traits and social distancing, agreeableness (r=.16, p=.02), and conscientiousness (r=.16, p=.01) were the only two Big 5 traits correlated with social distancing and were therefore the only two traits included in the model. In addition, autonomous motivation for social distancing was significantly positively correlated with social distancing (r= 58, p<.001), whereas controlled motivation was unrelated. Therefore, only autonomous motivation for social distancing was included in the subsequently tested model. Age was negatively related to social distancing (r=-.14, p=.03), whereas gender was unrelated. None of the Big 5 traits were correlated to participant's age and gender, except being female was significantly positively related with neuroticism (r=.12, p=.04).

Main analyses

A path model analysis was performed using robust maximum likelihood estimation (MLR) procedures using MPlus software (Muthén & Muthén, 2012) to test the mediational role of autonomous motivation for social distancing and community values in the relation between traits (i.e. agreeableness and conscientiousness) and social distancing[1]. The syntax and output are available on OSF (https://osf.io/km8e5/?view_only=b60b5e1e11c048b999b74db49b922db6). The model fit the data adequately: MLR χ^2 (*df* = 3, N = 284) = 1.365, *p* = .713, CFI = 1.000, RMSEA <.000 (<.000, .073), SRMR = .016. Please refer to Figure 1 and Table 2 for a full summary of the statistically tested paths and a display of the model. Importantly, a serial mediational path was found from agreeableness to T5 social distancing through both community values and autonomous motivation. The same serial mediational path was found from conscientiousness to T5 social distancing. Interestingly, a mediational path was also found from conscientiousness to T5 social distancing through autonomous motivation alone, however, this same path was not found for agreeableness.

Replicating main results with informant ratings of Big 5 traits and social distancing

Family reports at baseline of participants' Big Five Traits were available for 201 individuals and peer reports were available for 200. Family reports of social distancing were available for 144 participants and peer reports were available for 143. The correlations among participant and informant perceptions of the participant's social distancing, agreeableness and conscientiousness can be found in Table 3. Importantly, participant ratings of their own social distancing significantly correlated with friend (*r*=.39, *p*<.001) and family member (*r*=.33, *p*<.001) reports of participant social distancing. Both informants also agreed significantly regarding participant's level of adherence to social distancing guidelines (*r* = .32, *p* =002). Participants' self-reported ratings of their agreeableness were significantly positively correlated

with those of friend (r=.47, p<.001) and family member (r=.40, p<.001) reports of participant agreeableness. Participants self-reported ratings of their conscientiousness were significantly positively correlated with those of friend (r=.52, p<.001) and family member (r=.49, p<.001) reports of participant agreeableness. Family members and peers agreed significantly in their ratings of participants' level of Conscientiousness (r = .52, p < .001) and Agreeableness (r = .34, p < .001).

We planned to use the informant reports to replicate the central findings of the current investigation – that the Big 5 traits of Conscientiousness and Agreeableness were significantly related to levels of adherence. Mean scores for the traits and social distancing were calculated across the family and peer reporters, resulting in T1 trait scores for 242 participants and T6 social distancing scores for 200 participants. Informant reports of participants' social distancing (Mean = 6.54, SD= .87) were regressed on informant reports of participants' traits of Conscientiousness (Mean = 4.03, SD = .65) and Agreeableness (Mean = 4.11, SD = .57). A significant multiple R of .311 was obtained, F (2, 197) = 10.56, p < .001. Informants' ratings of Conscientiousness (beta = .199, t (197) = 2.85, p = .005, 95% CI [.08, .45]) and Agreeableness, (beta = .257, t (197) = 3.53, p = .001, 95% CI [.18, .63]) were significantly positively related to their ratings of participants level of adherence. The traits of extroversion, openness, and neuroticism were unrelated to reports of adherence (p's > .20). The significant results for informant ratings suggest that the positive relation between the traits of Agreeableness and Conscientiousness with adherence to social distancing guidelines were not simply the product of self-report biases.

Discussion

With the ongoing COVID-19 pandemic, the need to adhere to government health regulations to limit the spread of the virus has been of the utmost importance. The present study used a prospective longitudinal design to investigate personality and motivational factors that predict the extent to which an individual adheres to social distancing measures in a sample of undergraduate students during the first wave of the pandemic. First, we aimed to integrate self-determination theory's concept of autonomous and controlled motivation to explore whether individuals who managed to more effectively internalize and integrate the importance and value of social distancing during the COVID-19 pandemic and felt more autonomous in this endeavor would be more likely to adhere to the social distancing guidelines. Our results supported this hypothesis, which is consistent with several decades of research that have consistently found more effective goal-directed behaviour as a result of more autonomous engagement (e.g., Koestner, 2008; Koestner et al. , 2008; Milyavskaya et al., 2015; Moore et al., Koestner, 2019). Interestingly, controlled motivation was not associated with social distancing, although we do wonder if this changed as time progressed throughout the second and third waves of the pandemic. The implication of these motivational findings is that, in terms of informing future interventions aimed at increasing social distancing, using more autonomy supportive strategies, such as perspective-taking and providing elements of choice, which would foster more autonomous "want to" motivation, would be more effective than controlling strategies, such as highlighting threats and fines.

In addition, we had hypothesized that Big 5 personality traits that promote collaboration, such as conscientiousness and agreeableness, would orient individuals towards more intrinsic community values and would predispose an individual to better internalize the COVID-19 health recommendations. The results supported this hypothesis in that individuals who were higher on

agreeableness and conscientiousness tended to engage in more social distancing. The mediation analyses suggest that the link between the personality characteristics and adhering to the guidelines may result from greater internalization and integration of the importance and value of the social distancing guidelines and as a function of greater concern for the welfare of the community. The indirect path from conscientiousness to social distancing through autonomous motivation for social distancing was confirmed, whereas we did not find the same path for agreeableness. Being rule-bound and mindful of guidelines, social distancing may have felt easier and more natural to those higher in conscientiousness, resulting in greater autonomous motives to socially distance. In contrast, the link from agreeableness to social distancing seemed to primarily work through orienting individuals towards their community values, which in turn promoted socially cooperative behaviour. These results suggest a need to further study and promote socialization techniques (e.g., parenting, schooling, coaching) that increase agreeableness and conscientiousness in order to increase people's willingness to adhere to important health guidelines during world crises where there is a need to work collaboratively together to protect the public at large. In other words, we suggest that it may be possible to utilize techniques to increase one's standing on traits and values that orient people towards being more cooperative and collaborative, which could translate into greater adherence to public health guidelines during world crises. There is emerging evidence that personality is more flexible than previously thought, making these suggestions even more plausible (McAdams, 2015; Moore et al., 2020).

Within the present study, we also aimed to replicate our longitudinal findings linking traits to social distancing using friend and family informant reports of participants' personality and social distancing to incorporate a more objective assessment of participants' personality and

social distancing behaviours. Once again, we found that informant ratings of participants' agreeableness and conscientiousness were positively associated with informant ratings of the participant's adherence to social distancing guidelines. This replication of our results linking traits to social distancing behaviours bolsters our confidence in these findings.

The present study had several methodological strengths, such as having recruited a large sample and using a prospective longitidunal design that allowed us to use individual differences assessed prior to the COVID-19 pandemic to investigate variations in behavioral responses. In addition, we replicated our findings using informant reports which enhanced our confidence in these findings. There were also a few limitations to the present investigation that are important to note. In terms of the quality of measures used in the present study, future research would benefit from using more comprehensive measures of community values and participant and informant reports of social distancing. Additionally, although we did incorporate informant reports of personality and social distancing, future research would benefit from using behavioural measures of social distancing, such as phone tracking methods. Moreover, we acknowledge that the retention rate of informant reports and the coefficients in our main path analysis were lower than optimal. Additionally, the correlations between informant and self-reported assessments of personality were lower than expected. Furthermore, the study sample was drawn narrowly from undergraduate students attending a large public North American university and the sample was disproportionately female. Therefore, future research would benefit from exploring whether these findings are replicable in a more representative sample. Moreover, it's important to note that our analyses were correlational, and we can therefore not make firm conclusions about the causation.

At the time of writing this article, Canada has experienced three waves of the COVID-19 pandemic. During the first wave, COVID-19 pandemic restrictions were strictly imposed so that social gatherings were prohibited and all non-essential businesses (e.g., restaurants, gyms, services such as hairdressing salons) were ordered to close until the spring of 2020. During this lockdown period, there was variation in how much individuals complied with the restrictions, however, due to the closures there was not much else to do other than stay home. Throughout the pandemic, there have been periods where some of the restrictions were lifted (e.g., non-essential businesses opened, social gatherings within limits were allowed), but there still was the need for people to remain vigilant to limit further spread of the virus. An interesting future direction for this line of research would be to explore how personality and motivational variables impacted people's motivation for and actual adherence to social distancing guidelines throughout these different periods.

Moreover, the implications and real-world applicability of this research merit further consideration. The present study aimed to shed light on personality and motivational variables that are predictive of adhering to public health guidelines within the context of the pandemic with the hope of informing future interventions aimed at encouraging adherence during the remainder of the COVID-19 pandemic and beyond. Indeed, future research could explore whether these findings generalize across different kinds of public health guidelines, such as those aimed at increasing health promoting behaviours and cooperation during future crises and natural disasters. Our results suggest that to increase adherence to public health guidelines, it would be important for interventions to appeal to aspects of our personality that promote collaboration and cooperation and utilize strategies that promote more autonomous, rather than controlled, motivation for goal-directed behaviour.

Conclusion

To slow the spread of the virus during the COVID-19, many of us we were required make sacrifices and significantly change the way we live our lives. Naturally, this can be quite challenging and there was significant variation in the extent to which various individuals and groups adhered to the social distancing recommendations. The present study integrated personality theories and self-determination theory's concepts of autonomous motivation and intrinsic community values to shed light on personality and motivation factors that are predictive of greater social distancing. We are hopeful that a better understanding of personality and motivational factors that are associated with greater internalization and adherence to public health guidelines can pave the way for better targeted interventions in similar or related world crises.

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Footnote

[1]During data analysis, two alternate models were tested based on different theoretical ideas of how the data might work. The final model presented was chosen based on having the best model fit indices. The following fit indices were given priority in model evaluation: the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR). According to Kline (2011) and Tabachnick and Fidell (2007), the CFI should be 0.95 or higher, while the RMSEA and SRMR should be 0.06 or lower for acceptable model fit. The first alternate model was identical to the final model, except there was no direct association from conscientiousness to community values. We had tested this model as we had wondered if agreeableness and conscientious might have different mechanisms linking these them to social distancing; however, this model did not have adequate fit (MLR χ^2 (df = 4, N = 284) = 11.08, p = .03, CFI = .96, RMSEA .08 (.03, .14), SRMR = .05). The second alternate model was identical to the alternate model just described, except there was no direct association from community values to social distancing. We had tested this model as we had wondered if community values may only be associated with social distancing through autonomous motivation for social distancing; however, this model did not have adequate fit ((MLR χ^2 (df = 5, N = 284) = 16.96, p =.005, CFI = .93, RMSEA .09 (.05, .14), SRMR = .06)."

Article 2 : References

Ai, P., Liu, Y., & Zhao, X. (2019). Big Five personality traits predict daily spatial behavior: Evidence from smartphone data. *Personality and Individual Differences*, 147(October 2018), 285–291. https://doi.org/10.1016/j.paid.2019.04.02

Bogg, T., & Roberts, B. W. (2004). Conscientiousness and Health-Related Behaviors: A Meta-Analysis of the Leading Behavioral Contributors to Mortality. *Psychological Bulletin*, *130*(6), 887–919. https://doi.org/10.1037/0033-2909.130.6.887

Graziano, W.G. & Eisenberg, N. (1997) Agreeableness: A dimension of personality. In R. Hogan, J. A. Johnson & S. Briggs (Eds.), Handbook of personality psychology (pp. 795-824). San Diego, CA: Academic Press.

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research*, 2, 102–138.

Kasser, T., Ryan, R.M. (1996) Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 280-287.

Kline, R. B. (2011). Principles and practice of structural equation modeling (3rd ed.). New York: Guilford Press.

Koestner, R. (2008). Reaching one's personal goals: A motivational analysis focusing on autonomy. *Canadian Psychologist*, 49, 60-67.

Koestner, R., Otis, N., Powers, T., Pelletier, L., & Gagnon, H. (2008) Autonomous motivation, controlled motivation and goal progress. *Journal of Personality*, 76, 1201- 1230.

Levine, S. L., Holding, A. C., Milyavskaya, M., Powers, T. A., & Koestner, R. (2020). Collaborative autonomy: The dynamic relations between personal goal autonomy and perceived autonomy support in emerging adulthood results in positive affect and goal progress. *Motivation Science*.

Levine, S. L., Milyavskaya, M., Powers, T. A., Holding, A. C., & Koestner, R. (2021). Autonomous motivation and support flourishes for individuals higher in collaborative personality factors: Agreeableness, assisted autonomy striving, and secure attachment. *Journal of Personality*.

Li-Grining, C.P. (2007). Effortful Control among low-income preschoolers in three cities: Stability, change, an individual differences. *Developmental Psychology*, 43, 208.221.

McAdams, D. P. (2015). *The art and science of personality development*. Guilford Publications. https://doi.org/10.5860/choice.192399

Matraijt, L. Leung, T. (2020) Evaluating the effectiveness of social distancing interventions to dela or flatten the epidemic curve of coronavirus disease. *Emerging infections disease*, 26, 1740-1748.

McCrae, R. R., & Costa, P. T. (1987). Validation of the Five-Factor Model of Personality Across Instruments and Observers. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.52.1.81

Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying "no" to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000045

Moore, A. M., Holding, A., Buchardt, L., Koester, R. (2021). On the efficacy of volitional personality change in young adulthood: Convergent evidence using a longitudinal personal goal paradigm. *Motivation and Emotion*. https://doi.org/10.1007/s11031-021-09865-7

Moore, A., Holding, A., Verner-Filion, J., Harvey, B., & Koestner, R. (2020). A longitudinal investigation of trait-goal concordance on goal progress: The mediating role of autonomous goal motivation. *Journal of Personality*. https://doi.org/10.1111/jopy.12508

Muthén, L. K., & Muthén, B. O. (2012). *MPlus. The comprehensive modeling program for applied researchers: User's guide* (5th ed.).

Noftle, E. E. & Shaver, A. J. (2006) Attachment dimensions of the Big Five personality traits: Associations and comparative ability to predict relationship quality Journal of Research in Personality, 40, 179-208.

Onder, G., Rezza, G., & Brusaferro, S. (2020). Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. *JAMA - Journal of the American Medical Association*, *323*, 1775–1776. https://doi.org/10.1001/jama.2020.4683

Oosterhoff, B., Palmer, C. A., Wilson, J., & Shook, N. (2020). Adolescents' Motivations to Engage in Social Distancing During the COVID-19 Pandemic: Associations With Mental and Social Health. *Journal of Adolescent Health*, *67*(2), 179–185. https://doi.org/10.1016/j.jadohealth.2020.05.004

Rueda, M. R. (2012). Effortful control. In M. Zentner & R.L. Shiner (Eds), *Handbook of temperament (*pp. 145-167). New York: Guilford Press.

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. *Guilford Publications*.

Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: The relation of goal content and regulatory styles to mental health. In J. A. Bargh & P. M. Gollwitzer (Eds.), The psychology of action: Linking cognition and motivation to behavior (pp. 7-26). New York, NY: Guilford Press.

Sheldon, K.M. (2014). Becoming Oneself: The Central Role of Self-Concordant Goal Selection. *Personality and Social Psychology Review*, 18: 349-365.

Soenens, B., Vansteenkiste, M., & Niemiec, C. (2009). Should parental prohibition of adolescents' peer relationships be prohibited? *Personal Relationships, 16,* 507-530.

Swickert, R., Abushanab, B., Bise, H., & Szer, R. (2014). Conscientiousness Moderates the Influence of a Help-Eliciting Prime on Prosocial Behavior. *Psychology*, *05*(17), 1954–1961. https://doi.org/10.4236/psych.2014.517198

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). New York: Allyn & Bacon.

Zajenkowski, M., Jonason, P. K., Leniarska, M., & Kozakiewicz, Z. (2020). Who complies with the restrictions to reduce the spread of COVID-19?: Personality and perceptions of the COVID-19 situation. *Personality and Individual Differences*, *166*(June), 110199. https://doi.org/10.1016/j.paid.2020.110199

Article 2: Tables and Figures

Table 1

Means, standard deviations and correlations between all variables of interest.

	M	(SD)	1	2	3	4	5	6	7	8	9
1. Extraversion	3.15	.91	α= .88	.11	.09	**-.29**	**.24**	.10	.05	-.11	.03
2. Agreeableness	3.78	.64		α=.74	**.18**	**-.16**	**.15**	**.33**	**.14**	.01	**.16**
3. Conscientious	3.52	.71			α=.80	**-.18**	.01	**.23**	**.22**	.06	**.16**
4. Neuroticism	3.29	.89				α=.87	.01	**.12**	.03	**.20**	-.07
5. Openness to Experience	3.62	.68					α=.78	**.32**	.06	-.08	.04
6. T1 Com. Values	5.75	1.16						***r*=.50**	**.31**	.09	**.30**
7. T5 Aut. Mot. For SD	6.21	1.00							α=.75	**.21**	**.58**
8. T5 Con. Mot. For SD	4.59	1.69								α=.84	.06
9. T5 SD	6.41	.92									***r*=.77**

Note. Bolded terms represent $p < .05$; Aut. Mot. = autonomous motivation; Com. = community; Con. Mot. = controlled Motivation; SD = social distancing; T1 = baseline assessment; T5 = fifth follow-up survey. The values along the diagonal are the Cronbach alphas for the various scales or correlations between items for constructs assessed with two items.

Table 2

Summary of paths explored in the path model analyses exploring the mediational role of autonomous motivation for social distancing and community values in the relation between traits (i.e. agreeableness and conscientiousness) and social distancing.

Path	B[95% CI], *p*
Direct Effect	
T1 Agree. → T1 Com. Val.	**.30[.19, .41], *p* <.001**
T1 Consci. → T1 Com. Val.	**.17[.06, .28], *p* =.003**
T1 Consci. → T5 aut. mot. for SD	**.15[.02, .28], *p* =.02**
Com. Val.→ T5 aut. mot. for SD	**.27[.13, .42], *p* <.001**
T5 aut mot. For SD → T5 SD	**.54[.34, .69], *p* <.001**
T1 Com. Val.→ T5 SD	**.13[.02, .26], *p* =.03**
Indirect Effect from Consci to T5 SD	
T1 Consci. → T5 aut mot. For SD → T5 SD	**.08 [.02, .17], *p* =.04**
T1 Consci. → T1 Com. Val.→ T5 SD	.02 [.004, .06], *p* = .06
T1 Consci. → T1 Com. Val. → T5 aut. mot. For SD .→ T5 SD	**.03 [.01, .06], *p* = .046**
Indirect Effect from Agree to T5 SD	
T1 Agree. → T1 Com. Val.→ T5 SD	**.04[.01, .09], *p* =.04**
T1 Agree. → T1 Com. Val. → T5 aut. mot. For SD .→ T5 SD	**.04[.02, .09], *p* = .012**

Note. agree = agreeableness; aut. mot = autonomoour motivation; Consci = conscientiousness; Com. Val. = T1 community values; SD = social distacning; Bolded values indicate significance. STDYX values were reported.

Table 3

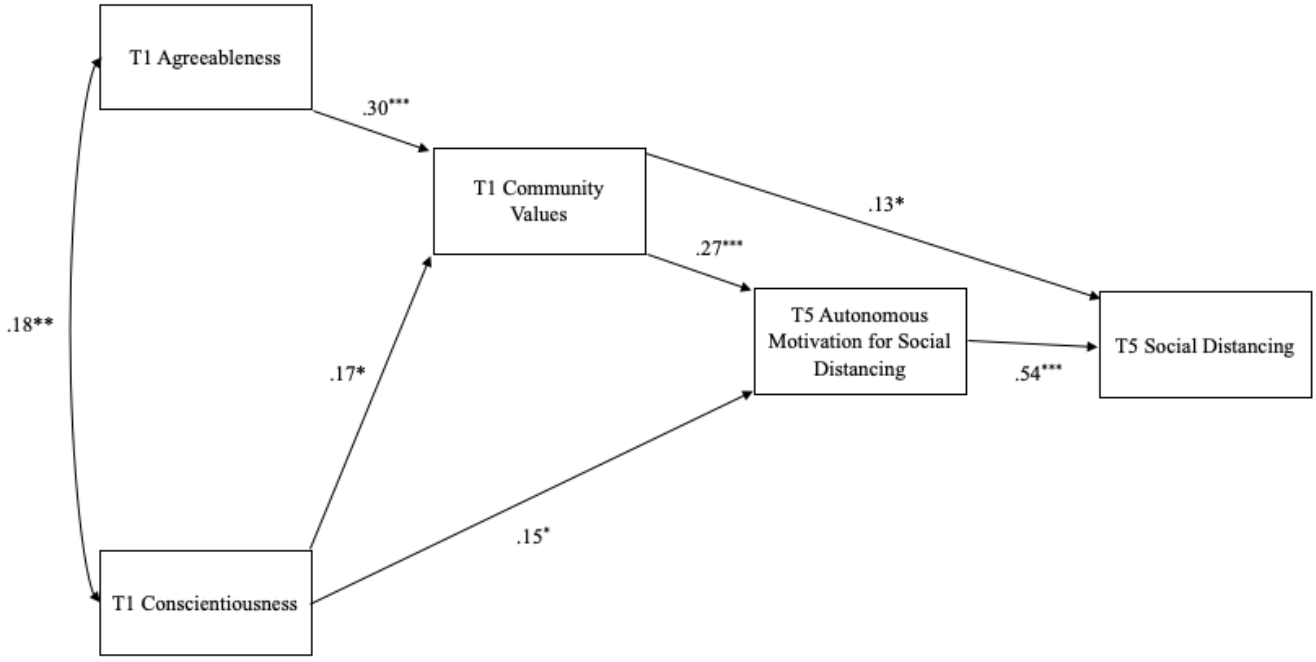
Correlations among participant and informant perceptions of the participant's social distancing, agreeableness and conscientiousness.

	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Participant rated SD	**.39**	**.33**	**.16**	.02	.03	**.16**	.07	<.00
2. Friend rated SD		**.32**	-.07	**.20**	.12	.15	**.17**	.16
3. Family member rated SD			.14	.17	**.27**	.04	**.20**	.11
4. Participant rated Agree				**.47**	**.40**	**.18**	.10	.13
5. Friend rated Agree					**.34**	.08	**.30**	.13
6. Family member rated Agree						-.04	**.17**	**.34**
7. Participant rated Consci.							**.52**	**.49**
8. Friend rated Consci.								**.52**
9. Family member rated Consci.								

Note. Bolded terms represent $p < .05$; Agree= agreeableness; Consci=conscientiousness; SD = social distancing.

Figure 1

Path model analyses of the mediational pathways from agreeableness and conscientiousness to adherence to social distancing guidelines through community values and autonomous motivation for social distancing.



Note. All significant paths and covariances are shown in the model; * $p < .05$, ** $p < .01$, *** $p < .001$.

Bridge to Article 3

Similar to Article 1, Article 2 explored whether there are motivational and behavioural advantages to pursuing goal-directed behaviour that is concordant with and supported by one's underlying personality traits. Article 2 extended the exploration of the personality-goal matching hypothesis by exploring how the Big Five traits related to the motivational dynamics involved in engaging in the potentially life-saving, goal-directed behaviours associated with social distancing during the global coronavirus pandemic. Slowing the spread of the virus through social distancing measures involved being motivated to protect those who are more vulnerable in our community and consistently and reliably enacting the behaviors associated with social distancing (e.g., maintaining a 2m distance whenever possible, limiting non-essential travel, etc...). The results confirmed that individual personality differences in conscientiousness and agreeableness, which promote collaboration and cooperation with others, oriented individuals toward more community aspirations and predisposed individuals to better internalizing and feeling more autonomously motivated to comply with the COVID-19 health recommendations. A methodological strength of Article 2 was that the link between the traits of agreeableness and conscientiousness and social distancing was also confirmed using informant (i.e., friend and family) reports of the participant's personalities and social distancing behaviours. Taken together, Article 1 and 2 integrated Self-Determination Theory with personality theories to explore the impact of the Big Five Traits on the motivational dynamics associated with certain types of goal-directed behaviour and the subsequent progress made on these goals. These results enhance our understanding of how individual differences in one's dispositional personality traits at the first level of personality influences one's motivation and goal-directed behaviours at the second-level of personality.

The previous two articles explored whether dispositional traits (i.e., level 1 of personality) influences one's pursuit of and motivation for goal directed behaviour (i.e., level 2 of personality). Article 3 will explore whether the opposite is true - whether goal directed behaviour (i.e., level 2 of personality) can change one's standing on the Big Five Traits (i.e., level 1 of personality). Seeing as Article 1 and 2 provide evidence that personality traits play an important role in goal pursuit, a natural next question becomes: What happens if we are pursuing goals for which our personality is not optimally matched? Are we capable of changing our personality by setting a goal to do so? Or are we simply stuck as we are? Article 3 explores the frequency, effectiveness, and impact of personality change goal pursuit using a longitudinal goal-setting paradigm within two multi-wave prospective longitudinal studies that utilized both a university student and community adult sample. Moreover, Self-Determination Theory's concept of the relative autonomy continuum will be integrated to explore the role of autonomous motivation within personality change goal pursuit. In addition, Article 3 proposed an alternate goal assessment methodology to those previously used in volitional personality change research, with the aim of more effectively capturing individuals with true goal intentions of pursuing personality change. Due to the relatively low frequency at which participants spontaneously generated and indicated personality change goals, we aggregated across multiple longitudinal studies that were conducted over consecutive years and have identical methodology. Of note, two of four data sets used in Study 1 of Article 3 overlap with the two data sets that were used in Article 1.

Article 3

On the efficacy of volitional personality change in young adulthood: Convergent evidence using a longitudinal personal goal paradigm

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Article 3: Abstract

The frequency, effectiveness, and impact of personality change goal (PCG) pursuit was explored using a longitudinal goal-setting paradigm within two multi-wave prospective longitudinal studies employing both a university student (study 1; n=1468) and community adult (study 2; n=248) sample. Self-determination theory (SDT) was incorporated to explore the extent to which PCGs reflect autonomous processes. Five major findings were revealed in study 1: 1) 20% of participants generated a PCG as one of their three yearly goals; 2) participants reported more progress on their PCGs than on other goals; 3) PCGs were more autonomous relative to other personal goals; 4) Autonomous motivation for goal pursuit was more strongly associated with PCG progress, relative to other goals; and 5) PCG progress resulted in improved psychological well-being over time. Study 2 replicated the motivational findings of study 1 within a community adult sample, and found evidence supporting the validity of the proposed longitidunal goal-setting paradigm. The present studies contribute to current PCG literature by using an alternate goal-assessment method that distinguishes desires to change from meaningful goal intentions and integrated SDT to enhance our understanding of volitional personality change.

Keywords: Big 5 personality traits, relative autonomy continuum, self-determination theory, personality change goals.

On the efficacy of volitional personality change in young adulthood: Convergent evidence using a longitudinal personal goal paradigm

Many individuals muse about improving their personalities by becoming more hard-working, socially confident, or less prone to worry. Some individuals even set specific goals to change their personality in these directions. But how common is it to desire to change one's own personality traits and how often do such desires develop into formal goal intentions? Moreover, are attempts to change one's personality successful, and do they influence how people feel about themselves and their lives? These are questions we sought to answer in the present investigation by exploring individual's volitional personality change goal pursuit.

The evolution of the field of personality psychology makes this an opportune time to explore questions about people's attempts to change their own personality. The Big 5 trait taxonomy has been widely accepted as a valid and reliable system for assessing individual differences in social and emotional behavior. There is evidence that the Big 5 traits can predict important life outcomes to the same degree as socio-demographic and cognitive factors (Roberts et al., 2007). Importantly, recent research has shown that an individual's standing on the Big 5 traits can change across adulthood despite also showing high levels of temporal stability (McAdams, 2015). Thus, there is now considerable evidence for both normative, age-graded change on these traits, as well as more person-specific, event-related change (Roberts & Mrozek, 2008). For example, across young adulthood, individuals generally become more emotionally stable, agreeable, and conscientious. Furthermore, specific events have been linked with personality change: academic sojourns have been associated with increased openness to experience (Greischel et al., 2016), finding a romantic partner has been associated with reduced neuroticism (Lehnert et al., 2001; Neyer & Lehnart 2007), and starting a career has been

associated with increased conscientiousness (Hudson & Roberts, 2016). Finally, a quantitative review showed that interventions, such as psychotherapy or assertiveness training, can reliably change personality traits in a positive direction (Roberts et al., 2017).

Given the accumulating evidence that personality traits can change because of developmental factors, life events, and psychological interventions, it is natural to explore whether people can also change their personality traits by setting personal goals to do so. Volitional personality change is defined as people's desires and attempts to change their own personality traits (Hudson & Fraley, 2017; Hudson et al., 2020). A methodology for studying volitional personality change was introduced by adapting the Big 5 Inventory (BFI; John & Srivastava, 1999), a widely used scale for assessing the Big 5 traits, to ask young adults the extent to which they wanted to increase, stay the same, or decrease on each of the 44 BFI trait term items (Hudson & Roberts, 2014). Results across four studies showed that a clear majority of young adults endorsed responses indicating that they desired to become more conscientious, agreeable, emotionally stable, extraverted, and open to experience (Hudson et al., 2020). Indeed, more than 80% of participants wanted to change on each dimension! Similar findings were obtained with young adults in diverse nations using a more general description of the Big 5 traits (Hudson & Fraley, 2016). The desire to change on personality dimensions has also been observed for older adults, but at more moderate rates (Hudson & Fraley, 2015). Moreover, it was generally those individuals at the less socially desirable end of each bipolar Big 5 trait dimension who had a goal to change on that trait (Hudson & Fraley, 2016b; Hudson et al., 2020). For example, it was the more introverted individuals who were more likely to indicate a desire to become more extraverted.

Does the desire to change one's traits predict actual changes in behavior? Experience-sampling studies designed to examine whether the desire to change was associated with trait-related behavior over 14 days yielded mixed results (Hudson & Roberts, 2014). Evidence for the efficacy of volitional personality change, however, has emerged from longitudinal studies. People who desire to change their personality traits appeared to do so over the span of 4 months on traits such as conscientiousness and emotional stability (Hudson & Fraley, 2015). An experimental intervention that trained participants to link implementation plans with their trait change goals was shown to accelerate change (Hudson & Fraley, 2015). Another study found that change goals resulted in durable personality change only if individuals followed through on behavioral challenges, such as going to parties if one wanted to become more extraverted (Hudson et al., 2019). Despite evidence that individuals *can* change their personality in their desired direction, it is unclear whether these changes can be maintained long-term. Indeed, one study that used a full year time frame failed to find effects for volitional personality change goals (Robinson et al., 2015).

Individuals who seek to change their personality anticipate that success will make their lives better (Hudson & Fraley, 2016a). Whether this expectation is realized seems to require distinguishing the desire for change from actual progress made in change. Thus, university students' *desire to change* on the traits of conscientiousness and openness to experience at the beginning of a semester was associated with <u>decreases</u> in adjustment over the course of the semester (Hudson & Fraley, 2016a). However, students who *succeeded at increasing* on any of the Big 5 traits over the course of the semester experienced simultaneous gains in well-being, relative to peers who did not wish to change on these traits (Hudson & Fraley, 2016a). That making progress at personality change goals is associated with better well-being is not surprising

given other forms of goal progress are a reliable pathway to well-being gains (Diener et al., 1999; Koestner et al., 2002).

Volitional personality change has clearly emerged as an important new research area. Nonetheless, in order to enhance our understanding of the divergent pattern of well-being outcomes associated with the desire to change versus progress at change, it is important to consider how the concept was defined. Volitional personality change refers broadly to both *desires* and *attempts* to change personality traits. Theories of goal pursuit across the life span have drawn a firm line between goal-related desires and goal intentions, arguing that they represent different phases in a dynamic goal action sequence, phases that are associated with distinct cognitive, affective, and motivational experiences (Gollwitzer, 2012: Heckhausen et al., 2010; 2019). Indeed, the metaphor of crossing the Rubicon has been used to capture the significance of shifting from a deliberative pre-actional goal phase to an implemental goal pursuit phase (Heckhausen et al., 2010). Similarly, the influential "stages of change theory" developed by Prochaska and colleagues (1992) argued that successful change involves a progression through a series of six stages for which there are distinct motivational processes. Desiring to change one's personality trait would be indicative of stage 2, labeled contemplation, which reflects on one's motivation. It is only during stage 4, labelled preparation, that one would make a formal intention to change the behavior in order to be aligned with their desired personality. Self-liberation is the key process during this stage. It involves making a choice and committing oneself to action.

It is unclear whether the personality change paradigm developed by Hudson and Fraley (2017) is capturing true goal *intentions* to change one's personality. By prompting participants with the 44 BFI trait-term items and asking if participants desire to change on each of these

traits, there would seem to be a risk that participants are reporting momentary (perhaps reactive) desires, rather than true goal intentions, or even simply responding in socially desirable ways (John & Srivastava, 1999). For example, because being extraverted and emotionally stable is typically socially desirable, individuals might respond that they want to be more "*sociable and outgoing*" and less "*depressed, blue*", even if they are not currently pursuing fully formed goals to make these changes. Indeed, participants in these studies may have been only in the early stages of the self-change sequence or in the deliberative phase of goal pursuit, which may account for some of the previous mixed findings about whether lasting volitional personality change can be achieved. The fact that two studies (Hudson et al., 2018; Hudson & Fraley, 2015) have shown that volitional personality change was most likely to succeed when individuals linked their goal with specific behaviors, or with an implementation plan, is consistent with the idea that the phase of the goal action cycle or stage of change may be highly relevant. The present investigation explored volitional personality change using methodology designed to capture meaningful goal intentions that are tied to a temporally defined goal action sequence.

Building upon volitional previous personality change research, two recent studies proposed alternate methodologies to assess personality change goals. The first assessed participants personality change goals by presenting participants with BFI trait terms and asking if they were or were not trying to modify this aspect of their personality (Baranski et al., 2017). If participants indicated that they were trying to change, they were then prompted to give an open-ended description of the specific personality aspect they desired to change, as well as the strategies (if any) they were using to move toward their goal. The results showed that about half of participants were pursuing personality change goals and it was typically participants with a less socially desirable personality profile who desired to change. While we view the open-ended

nature of participant responses within this study as an improvement on the previously used methodology in terms of moving closer towards capturing true goal intentions, seeing as participants are still being prompted with trait terms, there seems to be the same risk that it captures participants in the earlier stages on goal pursuit with passive goal desires.

A second study used a longitudinal design with a personality change goal assessment paradigm in which participants generated 10 personal goals that were later coded for whether they were related to Big 5 trait change (Miller et al., 2019). Seeing as these are personality change goals that were spontaneously generated when participants were asked what goals they were pursuing, we believe these are more likely to be active goals that the participant was working towards (i.e. true goal intentions). The authors sought to explore "*the frequency and prevalence of personality change goals in the context of an individual's entire set of personal goals*". The present investigation aimed to take this a step further and longitudinally explore the progress made on such personality change goals.

In addition to distinguishing between goal desires and actual goal intentions, another question is whether previous volitional personality change research has truly captured volitional processes. In the previous literature, volitional is defined as "self-initiated" personality change. However, we seek to expand on this research by suggesting that self-initiated personality change may not necessarily be self-endorsed (i.e. autonomous), and that self-endorsement is critical for predicting progress on personality change goals. We draw on Self-determination theory (SDT), a macro-theory of motivation and personality to make this assertion. SDT highlights the importance of exploring the autonomous dynamics of behavior (Ryan & Deci, 2017). According to SDT the motivation underlying a goal can be located on a continuum ranging from autonomous to controlled motivation (Ryan & Deci, 2017; Sheldon & Prentice, 2019). Having

more autonomous motivation means the individual whole-heatedly pursues the goal and finds it important and meaningful (i.e. pursuing a goal because you 'want to'). In contrast, having more controlled motivation for goal pursuit means the individual is pursuing the goal due to external or internal pressures, such as wanting to please others or because they would feel guilty or anxious if they did not (i.e. pursuing a goal because you 'have to'). Importantly, both autonomous and controlled goals can be "self-initiated" or "self-selected", but only the autonomous goal would be "self-endorsed". Overall, the relative autonomy continuum captures whether a goal is "autonomous", where autonomy is defined as selecting and pursuing something whole-heartedly (rather than half-heartedly), with a sense of personal endorsement rather than a sense of alienation.

According to SDT (Ryan & Deci, 2017), the motivation with which one pursues a goal reveals much about the way the person is likely to function, as well as the outcomes he or she can achieve. Indeed, several past studies have found that having more autonomous motivation for goal pursuit is predictive of making more goal progress (e.g., Koestner, 2008; Koestner et al., 2008; Milyavskaya et al., 2015; Holding et al., 2017; Moore et al., 2019). Previous volitional personality change research has explored whether individuals have a desire to change their personality. However, by integrating SDT's concept of the relative autonomy continuum, the present study sought to explore whether volitional personal change is autonomous and how the relative autonomy of personality change goals relates to later goal progress.

The Present Studies

The present investigations explored volitional personality change within a university student (study 1) and community adult (study 2) sample using methodology designed to capture

meaningful goal intentions. In study 1, as an alternative to directly asking people how much they want to change specific trait behaviors, we introduced Robert Emmons (2003) personal strivings methodology to examine the personal goals that university students spontaneously formed at the beginning of an academic year. Participants then subsequently reported on their progress and psychological well-being multiple times across an academic year. The content of student's personal goals generally involve academic, health, relationships, and leisure activities (Koestner et al., 2006). However, research on volitional personality change would suggest that a certain percentage of participants would report a personal goal that relates to changing one of their personality traits (Miller et al., 2019). In study 2, we then used a similar methodology to replicate and extend the findings of study 1 within a community adult sample. We propose that such a longitudinal goal paradigm is more likely to capture activated goals rather than a pre-decisional wish to change one's trait behavior in a virtuous and socially desirable direction. In addition, the present investigation sought to use SDT's concept of the relative autonomy continuum to more carefully explore the extent to which desires and attempts to change personality reflect autonomous processes.

In addition to tracking spontaneously generated personality change goals, the current research included two novel features that go beyond previous work on volitional personality change: 1) the time frame of goal pursuit has been extended, and 2) psychological well-being outcomes were assessed more broadly. As previously mentioned, most studies on volitional personality change have used a 4-month time frame and one study that used a full year time frame failed to find effects for volitional personality change goals (Robinson et al., 2015). Within study 1, we used the full academic year (i.e. 9 months) and, within study 2, we followed participants over a 6 month period.. Previous studies have assessed well-being primarily in terms

of life satisfaction. Within the present investigations, we include positive and negative affect along with life satisfaction so that we capture the standard components of subjective well-being (Diener et al., 1999). We also added assessments of highly positive psychological functioning – a measure of vitality (Ryan & Fredericks, 1997) – and an indicator of psychological distress – a measure of depressive symptoms (Radloff, 1997). It would be interesting to determine whether the effects of personality change extend beyond subjective well-being to impact more extreme levels of positive and negative functioning.

Study 1

Within Study 1, we aimed to examine frequency, effectiveness, and the psychological impact of personality change goal (PCG) pursuit. More specifically, we were interested in the following questions: 1) how frequently do young adults spontaneously generate a personality change goal? 2) Is a participant's baseline standing on the Big 5 traits associated with having a change goal? 3) How volitional are personality change goals – using Self-determination theory's relative autonomy continuum? 4) How much progress is made on personality change goals relative to other yearly goals, such as improving academic performance or starting to exercise more? 5) Does the relative autonomy of personality change goals influence progress? 6) Does progress on personality change goals result in improved psychological well-being over time?

We expected that spontaneous personality change goals would be rarer than previous research would suggest. Hudson and Roberts (2014) reported that 87% of university students reported personality change goals when explicitly prompted. Moreover, in line with previous research, we hypothesized that a less socially desirable standing on each of the Big Five traits would be correlated with having spontaneously generated a personality change goals. We expected that the extent to which young adults made progress on their personality change goals

would depend on their level of autonomous motivation. Finally, we expected that making progress on personality change goals would be associated with improved well-being over time. Both of the two previous predictions have been confirmed in previous research using the personal goal paradigm for personal goals in general, but have not been explored within the context of personality change goals specifically (Koestner et al., 2002; 2006; 2008; Koestner et al., 2014).

Methods

Participants

Participants were 1468 university students (78% female), aged 18 to 54 years, who were recruited to participate in four separate, large 6-wave prospective studies on personal goals and well-being that were conducted over four consecutive years. Based on previous volitional personality change studies that found small to moderate effect sizes, we aimed to have a sample of over 300 participants so we could be confident that we would have sufficient power to observe meaningful effects of 1) pursuing a personality change goal vs a control goal, 2) having autonomous motivation for pursuing a personality change goal versus having controlled motivation. Seeing as only 6% of the goals set by participants were related to personality change, in order to ensure sufficient power for analyses, the data for this study were drawn from four, separate prospective year-long studies conducted in 2013-2014, 2014-2015, 2015-2016, and 2016-2017, and had identical procedures and timelines for the follow-ups. 346 participants (74% female) were recruited during the 2013-2014 academic year, 198 (76% female) during 2014-2015, 425 during 2015-2016 (77% female), and 507 (84% female) during the 2016-2017 year. Overall, 51% of participants reported they were *White*, 32% reported *Asian*, 6% *Middle eastern*, *Arabic*, 4% *Latino-Hispanic*, 2% *Black/African*, and 1% *First Nations*.

Procedure

The present investigation made use of a series of large multi-wave longitudinal studies and, for the purpose of this investigation, only measures assessed at baseline (T1), mid-second semester (T2) and end of the academic year (T3) were relevant for consideration due to these being the time points at which the variables of interest were assessed. Additional details regarding the larger study from which the measures used in the present investigation were taken can be found in footnote 1. Over the course of each study, participants completed online questionnaires via Qualtrics experimental software (Qualtrics, Inc. Salt Lake City, UT). Participants completed the first survey (T1) at the start of the academic year and were asked to identify three personal goals that they were currently pursuing. In addition, they completed baseline measures of personalities, goal specific motivation and well-being outcomes. In T2 and T3, participants completed measures that assessed their personal goal progress and well-being. Participants were reminded at each follow-up what their personal goals had been. The completion rate of the surveys was 92% at both later time points. 170 participants (12%) failed to complete at least one of the follow-ups. Statistical tests were performed to compare the 1296 participants who completed every follow-up survey with the 170 participants who failed to complete one or more follow-ups. There was no significant difference between these two groups on any of the Big 5 traits. Out of the 1236 participants who completed goal study follow-ups, 310 reported a personality change goal, representing 6% of the total number of goals in our sample, and 20% of the total participants. Four participants had more than one personality change goal. In these cases, we included the first personality change goal they reported in the analyses.

Because three personal goals were elicited from each participant, we were able to yoke each personality change goal with another personal goal set by the same participant. That is, for each participant who indicated a personality change goal, we used one of their other yearly goals that was not about personality change as a control. This allowed us to examine whether personality change goals differed from other goals in terms of antecedent motivation or subsequent progress.

Data from these individual studies have been used in previous articles (citations blinded for review). However, no previous study has explored the current set of hypotheses. Indeed, personality change goals have never been examined using this goal-pursuit paradigm.

The present study was conducted in compliance with the McGill University Research and Ethics boards. Moreover, participants were financially compensated for their time. Participants were compensated up to CAN $50 for their participation, in either cash or Amazon gift cards, depending on how many surveys they completed.

Measures

Personal goals. *Following the instructions outlined in Koestner et al. (2002), at T1, participants were prompted to report three personal goals that they would be pursuing over the course of an academic year.*

Coding personality change goals. Personality change goals were differentiated from non-personality change goals based on the following two criteria. First, personality change goals are goals to change one's thoughts/feelings/behaviours, in a domain-general way. That is, the goal must constitute a desire to change one's general way of thinking/ feeling/ behaving in the world. If a goal was only specific to one or two situations, it was not a personality change goal. For example, *I want to make more friends* is not a personality change goal as the subject could be

perfectly happy with their current level of extraversion, but simply has not found a satisfying social circle. *I want to be more outgoing* is a personality change goal because it reflects the desire to be more extraverted, in a domain-general way. Similarly, *I want to procrastinate less on assignments*, is not a personality change goal because it does not necessarily reflect their desire to change their general behavior style in the world. *I want to stop procrastinating, manage my time better* are personality change goal because they reflect the wish to be more conscientious in general. Secondly, personality change, in and of itself, must be the goal target, and this must be explicit. For instance, the goal, *go travel and experience new things* is not a personality change goal. In pursuing this goal, the person may increase in openness to experience, but changing their personality is not the goal of the travel. While it is likely that people may change as a result of introducing a new habit, or having a new experience, we only coded goals that explicitly expressed the desire to change one's personality.

Two coders rated all goals in the 2016-17 data set. The reliability of coding as a personality change goal was alpha = .94. Table 1 presents the frequencies of personality change goals by Big 5 dimensions. Of the goals set by participants that were coded as personality change goals, the most common types of personality change were for extraversion (32%; e.g., *I want to become more social*), conscientiousness (27.2%; e.g., *I want to procrastinate less.*), and, emotional stability (22.7%; e.g., *I want to worry less*). 15.5% of the personality change goal set by participants were related to changing on openness to experience (e.g., *I want to get out of my comfort zone and experience new things) and g*oals to become more agreeable were relatively rare (2.6%; e.g., *I want to become more giving, altruistic and others-oriented*).

Coding control-goals*.* To compare progress made on personality change goals with progress made on other goals we included a second goal as a control for each participant who

had a personality change goal. If the personality change goal was the first spontaneously nominated goal, then we used the second spontaneously nominated goal as a control. If the personality change goal was the second goal, then we used the third goal as a control; and if the personality change goal was the third goal, we used the first goal as the control. We thus included both a personality change goal and a control goal for each participant in the main analyses.

Big 5 Personality traits. The participants' standing on the Big 5 Traits (conscientiousness, extraversion, neuroticism, agreeableness and openness to experiences) was assessed at baseline using the 44-item Big Five Inventory (BFI; John & Srivastava, 1999). Participants rated each item based on how much they agreed that the items reflected their own personality on a scale from 1 (meaning *strongly disagree*) to 5 (meaning *strongly agree*). An example of an item used to assess conscientiousness is *does things efficiently* and an example of an item to assess extraversion is *outgoing, sociable*.

Goal-specific motivation. At T1, participants were asked to rate their motivation for each of their personal goals using the 5-item scale outlined in Sheldon and Kasser (1998) that assess participants reason for goal pursuits. Autonomous motivation was assessed using the following three items: 1) because *of the fun and enjoyment which the goal provided you—the primary reason is simply your interest in the experience itself*, 2) *because it represents who you are and reflects what you value most in life*, 3) *because you really believe that it is an important goal to have—you endorse it freely and value it wholeheartedly. Controlled motivation was assessed using the following two items:* 1) *Because you would feel ashamed, guilty, or anxious if you didn't—you feel that you ought to work on this* 2) *because somebody else wants you to* and *because you'll get something from somebody if you do* (Sheldon & Kasser, 1998). All responses

were made on a 7-point scale ranging from 1 (meaning *not at all for this reason*) to 7 (meaning *completely for this reason*).

As in previous research, autonomous motivation was calculated as the mean of intrinsic, integrated and, identified ratings, whereas controlled motivation was calculated as the mean of external and introjected regulation (Koestner et al., 2008). Following Sheldon (2014), an index of relative autonomy was created by subtracting the mean of the controlled items from that of the autonomous items (Ryan & Deci, 2017).

Goal progress. Goal progress was assessed following the procedure outlined in Koestner et al. (2012) and was calculated as the mean of progress made at T2 and T3. On a 7-point scale ranging from 1 (meaning *strongly disagree*) and 7 (meaning *strongly agree*), participants rated how much they agree with the following statements: *I have made a lot of progress toward this goal*, *I feel like I am on track with my goal plan* and *I feel like I am achieving this goal*. The reliability of goal progress ratings was alphas > .90.

Psychological well-being. Five adjustments outcome measures were included in this study. The scales have been used widely and shown to be highly reliable. Participants were asked to respond based on their last two weeks of experience.

Affect. A 9-item scale was used to assess affect, which included four positive (e.g., *joyful*) and five negative (e.g., *frustrated*) affective items (Emmons, 1992). Participants rated each item on a scale from 1 (meaning *not at all*) to 7 (meaning *extremely*). The reliabilities for positive and negative affect were alphas .89 and .92, respectively.

Life satisfaction. The Satisfaction with Life Scale (SWLS; Diener et al., 1985) is a five-item scale that assesses participants life satisfaction over the previous two weeks (Diener et al., 1985). On a 7-point scale ranging from 1 (meaning *strongly disagree*) to 7 (meaning *strongly*

agree), participants rated items such as *in most ways my life is close to ideal* and *the conditions of my life are excellent*. The reliability for life satisfaction was alpha = .87.

Subjective Vitality. Subjective vitality, a sense of feeling a live and vital, was assessed using a 7-item scale developed by Ryan & Frederick (1997). On a 7-point scale ranging from 1 (meaning *not at all true*) to 7 (meaning *very true*), participants were to rate how true statements such as *I feel alive and vital* and *I nearly always feel alert and awake* were of them over the past two weeks. The reliability of the vitality scale was alpha = .86. Vitality was assessed in three out of the four studies included in this study (i.e., included in the 2013-2014, 2014-2015, 2015-2016 data sets).

Depressive Symptoms. The Centre for Epidemiologic Studies Depression Scale Revised (CESD-R 10; Radloff, 1977) was used to assess symptoms of depression. The CESD-R 10 is a validated self-report measure of depression symptoms, which focuses on the affectivity component of depressed mood (Björgvinsson et al., 2013). On a 4-point scale ranging from 1 (meaning *rarely or none of the time [less than 1 day]*) to 4 (meaning *All of the time [5-7 days]*), participants rated 10 statement, such as *I could not 'get going* and *I was bothered by things that usually don't bother me.* Depressive symptoms were assessed in three out of the four studies included in this study (i.e., included in the 2013-2014, 2015-2016, 2016-2017 data sets). The reliability for this scale was alpha = .78.

Results

Preliminary Analyses

To examine whether the year of the study moderated the effects we obtained for progress on personality change goals versus other kinds of goals we conducted a repeated measures analysis of variance in which type of outcome (personality change goal/control goal) was a

within-subject factor and year of the start of study (2013/2014/2015/2016) was a between-subject factor. The ANOVA revealed a highly significant effect for type of outcome, F (3,288) = 9.07, p < .01. The interaction effect between year of study and type of outcome did not approach significance, F (3, 288) = 1.65, ns. The lack of a significant interaction effect suggests that the greater goal success obtained for personality change goals compared to the control goals did not vary significantly across the four years of the study.

To examine whether the year of the study moderated the effects we obtained for relative autonomous motivation on personality change goals versus other kinds of goals we conducted a repeated measures analysis of variance in which type of outcome (personality change goal/control goal) was a within-subject factor and year of the start of study (2013/2014/2015/2016) was a between-subject factor. The ANOVA revealed a highly significant effect for type of outcome, F (3,306) = 10.21, p < .01. The interaction effect between year of study and type of outcome did not approach significance, F (3, 306) = 0.24, ns. The lack of a significant interaction effect suggests that the greater autonomous motivation obtained for personality change goals compared to the control goals did not vary significantly across the four years of the study.

Main results

Table 1 presents the means, standard deviations and correlations among many of the key variables included in this study. Bivariate correlational analyses were conducted in order to test whether participant's baseline standing on the Big 5 traits was associated with having indicated a personality change goals. Extraversion (r = -.06, p = .03) and conscientiousness (r = -.06, p = .03) were both significantly negatively correlated with having a personality change goal, whereas

neuroticism (r = .12, p < .001) was positively correlated. Agreeableness and openness to experience were uncorrelated with having a personality change goal.

Paired-sample t-tests compared participants' motivation and progress on personality change goals versus control goals. Results showed that personality change goals were rated as significantly higher in autonomy than control goals, t (310) = 3.28, p = .001. Personality change goals were also associated with greater progress than control goals, t (292) = 3.31, p = .001.

Goal Motivation and Goal Progress

In order to test the effect of goal motivation on goal progress for personality change and control goals, two separate hierarchical multiple regression analyses were conducted in which goal progress was regressed on (1) age and gender (entered together) and (2) goal-specific relative autonomy. A summary of these analyses can be found in Table 2. The hierarchical regression analyses revealed relative autonomy for personality change goals to be a significant predictor of personality change goal progress (F (1, 288) = 19.87, p<.001) and accounted for 6.5% of the variance in personality change goal progress. The analyses also revealed relative autonomy to be a significant predictor of control goal progress (F (1, 288) = 5.19, p= .02) but it accounted for only 1.8% of the variance in this case.

A test of the difference between dependent correlations, showed that the effect of relative autonomy on goal progress was significantly stronger for personality change goals than for control goals, Z = 2.29, p =.01 (Rosenthal, 1985).

Goal progress and well-being outcomes

Five separate hierarchical multiple regression analyses were conducted in which each outcome was regressed on (1) the baseline measure of outcome variable, (2) gender and age (entered together), and (3) progress made over the year for both the personality change goal and

the control goal. Baseline indicators were always significantly related to end of the year levels of the outcome – with betas ranging from .37 for positive affect to .69 for life satisfaction. Gender was unrelated to all outcomes, whereas age was only significantly negatively related to negative affect. Table 3 shows the standardized regression coefficients (betas), t-tests, 95% confidence intervals, and R^2 for goal progress for life satisfaction and positive and negative affect. Table 4 shows the results for subjective vitality and depressive symptoms. Personality change goal progress was significantly related to all five indicators of adjustment, whereas progress on control goals was only positively associated with life satisfaction. The strongest relations for personality change goals emerged for vitality and depression.

Test of the difference between dependent correlations showed that the effect of personality change goal progress on well-being outcomes was significantly stronger than for other goals, except with regard to life satisfaction: for positive affect, $Z = 2.14$, $p = .02$; for negative affect, $Z = -2.25$, $p < .01$; for vitality, $Z = 4.78$, $p < .001$; and for depression, $Z = -3.47$, $p < .001$ (Meng, Rosenthal & Rubin, 1992). Progress on personality change goals was thus more strongly associated with well-being than other progress on other types of personal goals.

Brief Discussion

Taken altogether, the results of study 1 suggest that university students are indeed capable of making progress on their personality change goals, even more so than when pursuing non-personality change goals, and that this progress is associated with enhanced well-being over time. In addition, the results of study 1 highlighted the benefits of autonomous engagement with personality change goals on subsequent goal progress.

University students are an opportune sample in which to study personality change as past research has found that young adulthood is the period in which individuals are expected to

experience the most personality change (Roberts & Davis, 2016). That being said, it is likely the case that non-student individuals from all walks of life may desire to change their personality or are pursuing personal goals for which personality change may be beneficial. Therefore, an important research endeavor would be to explore the generalizability of these research findings using similar methodology in a community sample.

Study 2

Study 2 sought to replicate and extend the results of study 1 within a non-student, community sample. More specifically, the aim of the study was answer three research questions. First, which of the Big 5 traits are community adults actively trying to change and does this differ from those in the university sample in study 1? Young adult university students and community adults likely differ in their interests and values because of their different life stages. Second, does the relative autonomy of community adults' personality change goals relate to subsequent goal progress? In line with evidence that autonomy is similarly important across the life span (Ryan & Deci, 2017), it was hypothesized that greater autonomous motivation for community adults' personality change goals would be predictive of making greater goal progress. Third, does progress on personality change goals result in improved psychological wellbeing over time?

Finally, and most importantly, we asked whether making progress on one's personality change goals would be associated with change as assessed by the Big Five Inventory (BFI; John & Srivastava, 1999)? By assessing traits at baseline and six months later we would be able to confirm whether self-reported success at the goal of changing on a specific personality trait was confirmed by examining change observed on the specific trait as measure by the Big 5 Inventory (John & Srivastava, 1999). Furthermore, if progress made on personality change goals correlated

with observed change on the Big 5 traits measured with the BFI, it would lend support for the validity of the goal paradigm we have used in this investigation.

Methods

Participants

The sample consisted of 248 non-student community adults (51.6% female), aged 21-71(M=38.83, SD=. 10.81), who were recruited using TurkPrime, an online crowdsourcing platform, to participate in an online, four-wave, longitudinal study on personal goals and wellbeing over a 6-month period. Additional details regarding the larger study from which the measures used in the present investigation were taken from can be found in footnote 2. The sample was limited in diversity: 83.5% Caucasian, 7.3% East Asian, 3.4% African American, and 2.7% identified as Latino/Hispanic.

Procedure

The present study was part of a large multi-wave longitudinal study and, for the purpose of this investigation, only measures assessed at baseline (T1) and the end of the study (T2) were relevant for consideration due to these being the time points at which the variables of interest were assessed. Over the course of the study, participants completed four online questionnaires via Qualtrics experimental software (Qualtrics, Inc. Salt Lake City, UT). Using a modified version of the personal goal setting instructions outlined in study 1, participants were asked to specifically identify a personality change goal that they were currently pursuing. In addition, participants completed the same baseline measures of personality change goal specific motivation as they did in study 1. To assess changes in well-being over time, four of the well-being indicators used in study 1 were also were assessed at T1 and T2 of study 2: negative and positive affect, life satisfaction and depressive symptoms. At the end of the study, participants

were reminded of their personality change goal and were asked to indicate their progress using the same measure as study 1.

Measures

Personality change goals. Using modified instructions from those outlined in Koestner et al. (2002), participants were asked to respond to the following prompt and generate a personality change goal: *Please take a moment to think of a personal goal that you are currently pursuing that is related to improving or changing something about your personality or character.*

Coding Personality Change Goals. A coding scheme for participant's personality change goals was developed to code for which of the Big 5 traits participants had goals to change on. Based on the work of McCrae & Costa (1987), raters were provided with a list of 6 adjectives representing the facets underlying each of the Big 5 traits and assessed which of the traits the participant's personality change goals is related to. For example, raters were to code goals that were related to wanting to become more *competent*, *orderly*, *dutiful*, *achievement oriented*, *self-disciplined*, and *deliberate* as a conscientiousness change goals. Participant's personality change goals were mostly related to emotional stability (34.6%) and agreeableness (22.6%), followed by extraversion (16.5%) and conscientiousness (15.7%). Very few personality change goals were related to openness to experience (3.2%). Seventeen participants (6.9%) set goals that were deemed to not be personality change goals (e.g., *Eat more healthy foods and cut back on unhealthy habits*; *Spend less time on the computer*) and these were left out of analyses.

Assessing 'actual' Big 5 traits change. In order to assess whether actual Big 5 Trait change occurred as a result of personality change goal pursuit, utilizing the abovementioned coding scheme, a trait change variable was computed where participant's change on the specific

trait that they wanted to change on was calculated. For example, if a participant's personality change goal was related to changing on agreeableness, their scores on trait agreeableness at baseline and the final assessment were used to assess trait change, whereas for someone who wanted to change on emotional stability (reversed-neuroticism) their scores on that trait were used to measure trait change, and the same for if they had wanted to change on any other trait. All trait scores were standardized before calculating this measure at baseline and at 6 months. That is, each participant had a score of their level on their change goal at both baseline and at the end of the study.

Results

Table 5 presents the means, standard deviations and correlations among the key variables included in study 2.

To examine the relation between one's relative autonomous motivation for their personality change goals and the progress they subsequently made, a hierarchical multiple regression analysis was conducted in which goal progress was regressed on (1) age and gender (enter together) and (2) goal-specific relative autonomy. The model was significant ($F(1, 191)= 7.33$, $p=.01$), revealing relative autonomy for personality change goals to be significantly associated with personality change goal progress ($b = .19$, $t = 2.71$, $p=.01$, 95% CI [.05, .29]) and accounted for 3.5% of the variance in personality change goal progress.

To examine whether change on the Big Five Inventory is associated with personality change goal pursuit, paired-sample t-tests compared participants' standing on the Big 5 trait that participants desired to change at baseline and at the end of the study. Results revealed that participants did significantly change on the desired trait between the start and end of the study, $t (193) = -2.21$, $p = .03$. Moreover, personality change goal progress at the end of

the study was significantly correlated with BFI change on the trait that participants had indicated they had a goal to change on (r =.34, p<.001), which suggests that progress on personality change goals corresponded with actual Big 5 trait change.

Four separate hierarchical multiple regression analyses were conducted in which each adjustment indicator was regressed on (1) the baseline measure of adjustment, (2) gender and age (entered together), and (3) personality change goal progress made over the course of the study. All baseline well-being indicators were significantly related to end of the year levels of the outcome – with betas ranging from .69 for positive affect to .91 for life satisfaction. Table 6 shows the standardized regression coefficients (betas), t-tests, 95% confidence intervals, and R2 for goal progress for positive and negative affect. Table 7 shows the results for life satisfaction and depressive symptoms. Overall, personality change goal progress was significantly positively related to positive affect and life satisfaction and was significantly negatively related to negative affect and depressive symptoms. Consistent with the findings of study 2, making progress on one's personality change goal was associated with enhanced well-being.

Discussion

The overarching purpose our investigation was to use a longitudinal goal-setting paradigm to test the frequency, effectiveness, and impact of personality change goals within two multi-wave prospective studies with university student and community adult samples. Moreover, the investigation sought to shed light on the autonomous/self-endorsed nature of personality change goals and the impact this has on subsequent goal progress. By utilizing an alternate personality change goal setting paradigm that tracks goals spontaneously generated by participants, we were more confident that we captured activated goal intentions, rather than diffuse wishes prompted by an experimental questionnaire. Importantly, findings from study 2

supported the validity of this proposed methodology in that the progress that participants reported making on their personality change goals correlated with actual Big 5 traits change, as assessed by changes in participant's BFI scores on the traits they reported having a goal to change on.

One of the first aims of study 1 was to explore how frequently young adults spontaneously generate personality change goals. The results of study 1 revealed that 20% of university students spontaneously set a personality change goal as one of their three main strivings for the 9-month academic year. This figure seems like a more realistic estimate of the frequency of personality change goals than how Hudson & Fraley (2016) found that over 80% of young adults indicated they want to change on each of their Big 5 traits when prompted with trait descriptions and asked if they want to change. In past studies, participants were also highly likely to indicate a desire to change on more than one of the Big 5 traits. In study 1, there was specificity among the personality change goals that participants set, with only 4 out of approximately 1500 participants indicating a personality change goal for more than one Big 5 trait dimension at the same time.

Secondly, in study 1 we had hypothesized that, in line with previous research (e.g., Hudson & Fraley, 2016b and Miller et al. 2019), a less socially desirable standing on each of the Big Five traits would be correlated with the generating a personality change goal. In other words, we hypothesized that individuals who are potentially less satisfied with their personality are more likely to pursue personality change goals. The results of study 1 revealed higher neuroticism and lower extraversion and conscientiousness to be significantly associated with having set a personality change goals at baseline. Interestingly, the strong majority (~82%) of the personality change goals set by participants in study 1 were related to these three traits; this

suggests that it is possible that individuals who have a less socially desirable standing on the Big 5 traits are those that are more likely to have personality change goals related to that trait. Had we had a larger sample in study 1 of participants pursuing goals related to openness to experience and agreeableness, it is possible that a significant correlation between pursuing change goals and these traits would have emerged as well.

Another important aim of the present investigation was to integrate SDT's concept of the relative autonomy continuum to examine how autonomous/self-endorsed personality change goals are. We accomplished this by directly assessing the level of autonomous versus controlled motivation that was associated with setting the goal and what impact this had on subsequent goal progress. These innovations allowed us to determine in study 1 that personality change goals are significantly more autonomous than other goals, reflecting that people pursue them because they are personally interesting and meaningful, rather than because they feel they are pressured by others. In order words, the results of study 1 revealed that young adults endorse personality change goals and to pursue them whole-heartedly. In addition, in study 1, we were interested in how much progress individuals make on their personality change goals, relative to other yearly goals. Tracking goal progress over 9 months revealed that participants made significantly greater progress on their personality change goals, as compared to other goals. Thus, young adults were more likely to succeed at *becoming more social* and *procrastinating less* than at goals such as *improve my grades* or *exercise twice a week*.

Another important aim of the present studies was to investigate whether the relative autonomy of one's personality change goals influences goal progress. Recall that autonomy refers to actions based on personal interest and meaning, rather than on external and internal pressures. The results of study 1 revealed that university students' personality change goals that

were based on autonomous motivation were particularly likely to be achieved, and study 2 found that these results replicated within a community adult sample. Interestingly, in study 1 we found evidence that autonomous motivation was even more important/relevant to the pursuit of personality change goals than other types of goals. The present study adds to a large body of research pointing to the adaptive benefits of autonomous goal motivation in the previously unresearched domain of volitional personality change. Studies have consistently found that autonomous goals were significantly associated with greater goal progress over time than non-autonomous goals (e.g., Koestner et al., 2008; Koestner et al., 2014). The same pattern of results has been obtained for university students, high school students, community adults, and patients in treatment (Gorin, Powers, Koestner, Wing & Raynor, 2014; Koestner et al., 2008). There appears to be at least four specific mechanisms that mediate the relation of autonomous motivation to greater goal success. Thus, autonomy appears to optimize goal pursuit because it is associated with (1) subjective ease of effort (Werner et al., 2017), (2) more effective use of implementation plans (Koestner et al., 2002); (3) automatic shielding of goals from temptations and distractions (Milyavskaya et al, 2015), and (4) fewer and less severe action crises (Holding et al., 2017). It will be important for future research on volitional personality change goals to explore some of these mechanisms.

Lastly, in both study 1 and 2, we were also interested in how progress on personality change goals relates to well-being. Tracking diverse psychological well-being indicators over the course of both studies allowed us to show that progress on personality change goals was uniquely associated with better adjustment, as compared to progress on other goals. Interestingly, in study 1, the benefits of making progress on personality change goals was particularly

noticeable for indicators of psychological distress (i.e., depressive symptoms) or psychological thriving (i.e., subjective vitality).

Taken together, our results provide encouraging evidence that individuals are capable of effectively pursuing goals to change their personality across the developmental life span. In addition, findings supported the hypothesis that autonomous engagement with a personality change goal fosters more meaningful progress on such goals. One interesting difference between personality change goal pursuit of university students and community adults concerned the traits selected to change. Undergraduate students (mean age = 21) primarily wanted to become more extraverted and conscientious whereas community adults (mean age = 42) wanted to become more emotionally stable and agreeable. These findings no doubt reflect the different values, interests, and tasks of young adults in university with older adults living in the community.

There are limitations to the present investigations. First and foremost, the present study relied exclusively on self-reports measures of personality, goal progress, and well-being. Future research should consider alternate and perhaps more objective methods of personality and goal progress assessment, such as informant reports. Previous studies that have included such objective indicators of goal progress generally find good correspondence with self-reported progress (Koestner et al., 2012, Gorin et al., 2014). Second, even though the duration of study 1 was a full academic year, which is a longer time frame than the majority of past research on volitional personality change, future research should consider extending the time frame even longer to track whether the acquired personality change is maintained long-term.

The present study used a prospective longitudinal design and novel methodology to track the progress made on personality change goals. The results obtained in this study provide support for the idea that people can transform their personalities to become more in line with how they

want to be. However, setting an explicit goal to change one's personality is only one pathway towards effective personality change. Personality change may also come by pursuing non-personality change goals that still require altering one's personality. For example, a goal to make more friends may require someone to become more extraverted and agreeable. Likewise, a goal to get a promotion at work may require someone to become more conscientious. According to Bryan Little's (2008) free trait theory, in the context of certain important goals, an individual can stretch their natural personality to pursue goals that are not in line with their natural underlying personality. It would be interesting for future research to explore whether personality change is most likely to be achieved by setting an explicit goal to do so, as was explored in the present study, or out of necessity in order to accomplish an important and meaningful personal goal. We hope that the present findings stimulate more personality change research in this area.

In conclusion, the present study used alternate methods to those previously employed in personality change research but arrived at many of the same conclusions as Hudson, Fraley and colleagues regarding volitional personality change. Namely, that many individuals do desire to change their personality and can make progress at this goal. Importantly, our methods allowed us to distinguish between goal desires and intentions, which may have accounted for some of the mixed findings in past research. To our knowledge, the present study was the first to integrate self-determination theory's focus on the autonomy underlying one's reasons for action with recent personality change goal research, and found that both young adults and older adults who pursue volitional personality change are likely to achieve progress, and such progress is associated with higher levels of well-being.

Footnotes

[1]The measures used in study 1 were taken from four large, 9-month-long, six-wave, prospective longitudinal studies on personal goals and well-being that were conducted with four separate samples of university students over 4 consecutive academic years. For the present study, the data was aggregated from 4 studies due to the low frequency of personality change goals (i.e. only 6% of goals set by participants were personality change goals, leaving only 20% of participants to be included in analyses). At baseline, participants completed a longer 45-minutes survey where they generated three personal goals and completed various goal-specific measures. In addition, participants also completed several baseline measures individual difference constructs (e.g. Big 5 traits, perfectionism, life aspirations, basic psychological need satisfaction). Thereafter, participants completed five 15-minute follow-up surveys that tracked their personal goal progress and changes in their well-being. The study was conducted over the course of a 9-month academic year (i.e. two semesters). Three survey were sent out each semester – at the start, middle, and at the end of the semester.

[2]The measures used in study 2 were taken from a four-wave longitudinal study conducted over a 6-month period. Non-student community adult participants were recruited through TurkPrime and compensated in line with the recommended rate. Participants completed a longer baseline survey (25-minutes) where the generated personal goals and completed baseline measures of individual difference constructs. Participants were then followed up at approximately 8-week intervals and completed 15-minute surveys to track their goal progress and changes in well-being.

[3]For the results of study 1, we also separated the motivation ratings into autonomous (intrinsic, identified and integrated) and controlled (external regulation and introjection) to determine whether the effects of relative autonomy could be differentiated further. Paired t-tests conducted separately for autonomy and controlled motivation for personality change revealed that participants who had a personality change goal were distinct in having less controlled reasons for wanting to change. Regarding the prediction of change on the personality goal, more fine-grained analyses showed that autonomous motivation for change and controlled motivation for change had roughly equal effects on actual change, but in opposite directions. That is, when personality change was regressed on autonomous and controlled motivation, the results showed that autonomous motivation was highly positively related to change (beta = .18, t (289)= 3.18, $p < .01$) and controlled motivation was significantly negatively related to change goal progress (beta = -.15, t (289)= -2.56, $p < .01$). Finally, readers may be interested in knowing that autonomous motivation for personality change was correlated with scoring higher on the BFI measure of extraversion (r= .19) and openness to experience (r=.17) whereas controlled motivation was correlated with scoring lower on extraversion (r=-.11), conscientiousness (r=-.19) and emotional stability (r=-.11). We focus on the relative autonomy index in the main text of the article to simplify the presentation of results.

Article 3 : References

Baranski, E. N., Morse, P. J., & Dunlop, W. L. (2017). Lay Conceptions of Volitional Personality Change: From Strategies Pursued to Stories Told. *Journal of Personality,* 85(3), 285–299. https://doi.org/10.1111/jopy.12240

Björgvinsson, T., Kertz, S. J., Bigda-Peyton, J. S., McCoy, K. L., & Aderka, I. M. (2013). Psychometric Properties of the CES-D-10 in a Psychiatric Sample. *Assessment.* https://doi.org/10.1177/1073191113481998

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *In Canadian Psychology*. https://doi.org/10.1037/a0012801

Diener, E., Emmons, R. A., Larsem, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment.* https://doi.org/10.1207/s15327752jpa4901_13

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin.* https://doi.org/10.1037/0033-2909.125.2.276

Emmons, R. A. (1986). Personal Strivings. An Approach to Personality and Subjective Well-Being. *Journal of Personality and Social Psychology.* https://doi.org/10.1037/0022-3514.51.5.1058

Emmons, R. A. (1992). Abstract Versus Concrete Goals: Personal Striving Level, Physical Illness, and Psychological Well-Being. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.62.2.292

Emmons, R. A. (2004). Personal goals, life meaning, and virtue: Wellsprings of a positive life. In Flourishing: Positive psychology and the life well-lived. https://doi.org/10.1037/10594-005

Gollwitzer, P. M. (2012). Mindset theory of action phases. *In Handbook of Theories of Social Psychology:* Volume 1. https://doi.org/10.4135/9781446249215.n26

Gorin, A. A., Powers, T. A., Koestner, R., Wing, R. R., & Raynor, H. A. (2014). Autonomy support, self-regulation, and weight loss. *Health Psychology*. https://doi.org/10.1037/a0032586

Greischel, H., Noack, P., & Neyer, F. J. (2016). Sailing Uncharted Waters: Adolescent Personality Development and Social Relationship Experiences During a Year Abroad. *Journal of Youth and Adolescence.* https://doi.org/10.1007/s10964-016-0479-1

Heckhausen, J., Wrosch, C., & Schulz, R. (2019). Agency and Motivation in Adulthood and Old Age. *Annual Review of Psychology.* https://doi.org/10.1146/annurev-psych-010418-103043

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A Motivational Theory of Life-Span Development. Psychological Review. https://doi.org/10.1037/a0017668

Holding, A. C., Hope, N. H., Harvey, B., Marion Jetten, A. S., & Koestner, R. (2017). Stuck in Limbo: Motivational Antecedents and Consequences of Experiencing Action Crises in Personal Goal Pursuit. *Journal of Personality*. https://doi.org/10.1111/jopy.12296

Holding, A. C., St-Jacques, A., Verner-Filion, J., Kachanoff, F., & Koestner, R. (2020). Sacrifice—but at what price? A longitudinal study of young adults' sacrifice of basic psychological needs in pursuit of career goals. *Motivation and Emotion.* https://doi.org/10.1007/s11031-019-09777-7

Holding, A., Hope, N., Verner-Filion, J., & Koestner, R. (2019). In good time: A longitudinal investigation of trait self-control in determining changes in motivation quality. *Personality and Individual Differences.* https://doi.org/10.1016/j.paid.2018.11.001

Hope, N. H., Holding, A. C., Verner-Filion, J., Sheldon, K. M., & Koestner, R. (2019). The path from intrinsic aspirations to subjective well-being is mediated by changes in basic psychological need satisfaction and autonomous motivation: A large prospective test. *Motivation and Emotion.* https://doi.org/10.1007/s11031-018-9733-z

Hudson, N. W., Briley, D. A., Chopik, W. J., & Derringer, J. (2019). You have to follow through: Attaining behavioral change goals predicts volitional personality change. *Journal of Personality and Social Psychology.* https://doi.org/10.1037/pspp0000221

Hudson, N. W., & Chris Fraley, R. (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000021

Hudson, N. W., & Chris Fraley, R. (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000021

Hudson, N. W., & Fraley, R. C. (2016). Changing for the Better? Longitudinal Associations Between Volitional Personality Change and Psychological Well-Being. *Personality and Social Psychology Bulletin.* https://doi.org/10.1177/0146167216637840

Hudson, N. W., & Fraley, R. C. (2016b). Do People's Desires to Change Their Personality Traits Vary With Age? An Examination of Trait Change Goals Across Adulthood. *Social Psychological and Personality Science.* https://doi.org/10.1177/1948550616657598

Hudson, N. W., Fraley, R. C., Chopik, W. J., & Briley, D. A. (2020). Change Goals Robustly Predict Trait Growth: A Mega-Analysis of a Dozen Intensive Longitudinal Studies Examining Volitional Change. *Social Psychological and Personality Science.* https://doi.org/10.1177/1948550619878423

Hudson, N. W., & Roberts, B. W. (2014). Goals to change personality traits: Concurrent links between personality traits, daily behavior, and goals to change oneself. *Journal of Research in Personality.* https://doi.org/10.1016/j.jrp.2014.08.008

Hudson, N. W., & Roberts, B. W. (2016). Social investment in work reliably predicts change in conscientiousness and agreeableness: A direct replication and extension of Hudson, Roberts, and Lodi-Smith (2012). *Journal of Research in Personality.* https://doi.org/10.1016/j.jrp.2015.09.004

Koestner, R., Horberg, E. J., Gaudreau, P., Powers, T., Di Dio, P., Bryan, C., … Salter, N. (2006). Bolstering implementation plans for the long haul: The benefits of simultaneously boosting self-concordance or self-efficacy. *Personality and Social Psychology Bulletin.* https://doi.org/10.1177/0146167206291782

Koestner, R., Lekes, N., Powers, T. A., & Chicoine, E. (2002). Attaining personal goals: Self-concordance plus implementation intentions equals success. *Journal of Personality and Social Psychology.* https://doi.org/10.1037/0022-3514.83.1.231

Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality*. https://doi.org/10.1111/j.1467-6494.2008.00519.x

Koestner, R., Powers, T. A., Carbonneau, N., Milyavskaya, M., & Chua, S. N. (2012). Distinguishing Autonomous and Directive Forms of Goal Support: Their Effects on Goal Progress, Relationship Quality, and Subjective Well-Being. *Personality and Social Psychology Bulletin*. https://doi.org/10.1177/0146167212457075

Koestner, R., Powers, T. A., Milyavskaya, M., Carbonneau, N., & Hope, N. (2015). Goal Internalization and Persistence as a Function of Autonomous and Directive Forms of Goal Support. *Journal of Personality*. https://doi.org/10.1111/jopy.12093

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-Term Effects of Social Investment: The Case of Partnering in Young Adulthood. *Journal of Personality.* https://doi.org/10.1111/j.1467-6494.2010.00629.x

McAdams, D. P. (2015). The art and science of personality development. *Guilford Publications.* https://doi.org/10.5860/choice.192399

McCrae, R. R., & Costa, P. T. (1987). Validation of the Five-Factor Model of Personality Across Instruments and Observers. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.52.1.81

Meng, X. L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.111.1.172

Miller, T. J., Baranski, E. N., Dunlop, W. L., & Ozer, D. J. (2019). Striving for change: The prevalence and correlates of personality change goals. *Journal of Research in Personality*, 80, 10–16. https://doi.org/10.1016/j.jrp.2019.03.010

Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying "no" to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000045

Moore, A., Holding, A., Verner-Filion, J., Harvey, B., & Koestner, R. (2020). A longitudinal investigation of trait-goal concordance on goal progress: The mediating role of autonomous goal motivation. *Journal of Personality*. https://doi.org/10.1111/jopy.12508

Moore, E., Holding, A. C., Hope, N. H., Harvey, B., Powers, T. A., Zuroff, D., & Koestner, R. (2018). Perfectionism and the pursuit of personal goals: A self-determination theory analysis. Motivation and Emotion. https://doi.org/10.1007/s11031-017-9654-2

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.81.6.1190

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across Young adulthood. *Journal of Personality*. https://doi.org/10.1111/j.1467-6494.2007.00448.x

Prochaska, J. O., Diclemente, C. C., & Norcross, J. C. (1993). In search of how people change: Applications to addictive behaviors. *Journal of Addictions Nursing.* https://doi.org/10.3109/10884609309149692

Roberts, B. W., & Davis, J. P. (2016). Young Adulthood Is the Crucible of Personality Development. *Emerging Adulthood*. https://doi.org/10.1177/2167696816653052

Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The Power of Personality: The Comparative Validity of Personality Traits, Socioeconomic Status, and Cognitive Ability for Predicting Important Life Outcomes. *Perspectives on Psychological Science.* https://doi.org/10.1111/j.1745-6916.2007.00047.x

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin.* https://doi.org/10.1037/bul0000088

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science*. https://doi.org/10.1111/j.1467-8721.2008.00543.x

Robinson, O. C., Noftle, E. E., Guo, J., Asadi, S., & Zhang, X. (2015). Goals and plans for Big Five personality trait change in young adults. *Journal of Research in Personality.* https://doi.org/10.1016/j.jrp.2015.08.002

Ryan, R. M., & Connell, J. P. (1989). Perceived Locus of Causality and Internalization: Examining Reasons for Acting in Two Domains. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.57.5.749

Ryan, R. M., & Frederick, C. (1997). On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being. *Journal of Personality.* https://doi.org/10.1111/j.1467-6494.1997.tb00326.x

Sheldon, K. M., & Prentice, M. (2019). Self-determination theory as a foundation for personality researchers. *Journal of Personality.* https://doi.org/10.1111/jopy.12360

Werner, K. M., Milyavskaya, M., Foxen-Craft, E., & Koestner, R. (2016). Some goals just feel easier: Self-concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences.* https://doi.org/10.1016/j.paid.2016.03.002

Article 3: Tables

Table 1

Descriptives of and correlations among key variables.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. PCG progress	4.52	1.16													
2. Non-PCG Progress	4.11	1.35	.28***												
3. Rel. aut. for PCG	2.30	2.09	.25***	.06											
4. Rel. aut. for non-PCG	1.81	2.33	.09	.13*	.29***										
5. T1 positive affect	4.93	1.09	.23***	.12*	.15**	.15**									
6. T3 positive affect	4.71	1.26	.33***	.18**	.11	.17**	.36***								
7. T1 negative affect	3.47	1.14	-.23***	-.11	-.24***	-.15*	-.24***	-.13***							
8. T3 negative affect	3.87	1.28	-.23***	-.08	-.14*	-.17**	-.15***	-.41***	.45***						
9. T1 life satisfaction	4.68	1.28	.25***	.25***	.13*	.07	.49***	.33***	-.34***	-.24***					
10. T3 life satisfaction	4.80	1.42	.35***	.36***	.10	.09	.34***	.55***	-.26***	-.34***	.70***				
11. T1 vitality	4.29	1.12	.30***	.17*	.19**	.14*	.62***	.33***	-.45***	-.24***	.49***	.37***			
12. T3 vitality	4.01	1.31	.46***	.16*	.15*	.15*	.41***	.74***	-.33***	-.59***	.39***	.58***	.50***		
13. T1 dep. symp.	10.40	5.15	-.27***	-.16*	-.20**	-.15*	-.46***	-.25***	.65***	.39***	-.46***	-.36***	-.54***	-.41***	
14. T3 dep. symp.	11.76	5.94	-.30***	-.14*	-.15*	-.19**	-.26***	-.60***	.40***	.74***	-.32***	-.47***	-.35***	-.69***	.48***

Note. Dep. Symp. = Depressive symptoms; PCG= personality change goal; Rel. aut. = Relative autonomy; SD = Standard Deviation; T1 = Baseline Assessment; T3 = End-of-year assessment; $^{*}p$ <.05**; $^{**}p$ < .01; $^{***}p$ < .0

Table 2

Hierarchical regression analyses predicting end-of-year goal progress from participant's relative autonomy for personality change and non-personality change goals.

	Personality change goal progress					Non-personality change goal progress				
	β	t	CI	R^2	F	β	t	CI	R^2	F
Step 1				.00	0.05				.00	.65
Age	-.02	-.28	[-.06, .04]			.01	.22	[-.05, .06]		
Gender	.01	.13	[-.33, .38]			-.07	-1.10	[-.65, .18]		
Step 2				.07	6.66^{***}				.02	2.17
Relative Autonomy	$.25^{***}$	4.458	[.08, .21]			$.13^{*}$	2.28	[.01, .14]		

Note. $^{*}p < .05^{**}$; $^{***}p < .001$.

Table 3

Hierarchical regression analyses investigating the relation between measures of various well-being and making progress on personality change and non-personality change goals.

	Positive affect					Negative affect					Life Satisfaction				
	β	t	CI	R^2	F	β	t	CI	R^2	F	β	t	CI	R^2	F
Step 1				.14	43.36^{***}				.17	54.90^{***}				.48	245.01^{***}
Baseline WB	$.37^{***}$	6.59	[.33, .62]			$.41^{***}$	7.41	[.34, .58]			$.69^{***}$	15.65	[.70, .90]		
Step 2				.14	14.59^{***}				.19	20.19^{***}					81.56^{***}
Age	-.04	-.60	[-.07, .04]			$-.12^{*}$	-2.23	[-.11, -.01]			.03	.72	[-.03, .06]	.48	
Gender	.03	.48	[-.31, .50]			-.02	-.36	[-.46, .31]			.03	.57	[-.24, .43]		
Step 3				.21	13.74^{***}				.21	13.68^{***}					59.75^{***}
PCG Prog.	$.23^{***}$	3.91	[.13, .39]			$-.15^{*}$	-2.55	[-.29, -.04]			$.15^{**}$	3.25	[.07, .29]	.53	
Non-PCG Prog.	.08	1.46	[-.03, .20]			.01	.19	[-.10, .12]			$.16^{**}$	3.48	[.07, .27]		

Note. PCG = personality change goal; Prog. = Progress; WB = well-being; $^{*}p < .05^{**}$; $^{**}p < .01$; $^{***}p < .001$.

Table 4

Hierarchical regression analyses investigating the relation between vitality and depressive symptoms and making progress on personality change and non-personality change goals.

	Vitality					Depressive Symptoms				
	β	t	CI	R^2	F	β	t	CI	R^2	F
Step 1				.22	52.48*				.19	50.33***
Baseline WB	.47*	7.24	[.44, .77]			.43*	7.10	[.35, .62]		
Step 2				.22	17.40*				.19	17.33***
Age	.03	.40	[-.06, .09]			-.07	-1.10	[-.42. .12]		
Gender	-.01	-.20	[-.49, .40]			-.04	-.67	[-2.63, 1.30]		
Step 3				.33	18.13*				.27	16.34***
PCG Prog.	.35*	5.41	[.26, .57]			-.28*	-4.54	[-2.03, -.80]		
Non-PCG Prog.	.02	.32	[-.11, 15]			-.04	-.62	[-.71, .37]		

Note. PCG = personality change goal; Prog. = Progress; WB = well-being; Vitality was assessed in three out of the four studies included in this study (i.e., included in the 2013-2014, 2014-2015, 2015-2016 data sets; Depressive symptoms were assessed in three out of the four studies included in this study (i.e., included in the 2013-2014, 2015-2016, 2016-2017 data); * $p < .05$.

Table 5

Descriptives of and correlations among key variables in Study 2.

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. PCG progress	4.32	1.66										
2. Rel. aut. for PCG	1.86	1.97	.17*									
3. T1 positive affect	4.31	1.52	.22**	.18**								
4. T2 positive affect	4.14	1.36	.30***	.14*	.70***							
5. T1 negative affect	2.67	1.40	-.22**	-.21**	-.62***	-.52***						
6. T2 negative affect	2.74	1.36	-.23**	-.17*	-.45***	-.59***	.70***					
7. T1 life satisfaction	3.90	1.63	.28**	.26***	.70***	.63***	-.55***	-.50***				
8. T2 life satisfaction	3.93	1.66	.31***	.25***	.64***	.71***	-.54***	-.57***	.91***			
9. T1 dep. symp.	7.83	6.25	-.15*	-.23***	-.72**	-.61***	.83***	.68***	-.62***	-.62***		
10. T2 dep. symp.	8.22	6.12	-.25***	-.15*	-.53***	-.71***	.65***	.85***	-.54***	-.62***	.73***	

Note. Dep. Symp. = Depressive symptoms; PCG= personality change goal; Rel. aut. = Relative autonomy; SD = Standard Deviation; T1 = Baseline Assessment; T3 = End-of-year assessment; $^{*}p$ <.05**; $^{**}p < .01$; $^{***}p < .001$.

Table 6

Study 2 hierarchical regression analyses investigating the relation between positive and negative affect and making progress on personality change goals in a community sample.

	Positive Affect					Negative Affect				
	β	t	CI	R^2	F	β	t	CI	R^2	F
Step 1				.47	171.74*				.51	202.68*
Baseline WB	.69*	13.12	[.52, .71]			.72*	14.24	[.61, .81]		
Step 2				.02	3.50*				.02	4.72*
Age	.01	.25	[-.01, .01]			-.14*	-2.78	[-.03. -.01]		
Gender	-.14*	-2.64	[-.65, -.09]			.09	1.69	[-.04, .50]		
Step 3				.04	14.02*				.01	5.48*
PCG Progress	.20*	3.75	[.07, .24]			-.12*	-2.34	[-.18, -.02]		

Note. WB = well-being indicator; PCG = personality change goal; *p <.05.

Table 7

Study 2 hierarchical regression analyses investigating the relation between life satisfaction and depressive symptoms and making progress on personality change goals in a community sample.

	Life Satisfaction					Depressive Symptoms				
	β	t	CI	R^2	F	β	t	CI	R^2	F
Step 1				.83	953.46*				.54	226.56*
Baseline WB	.91*	30.87	[.89, 1.01]			.74*	15.05	[.68, .89]		
Step 2				.004	2.23				.02	4.79*
Age	.01	.36	[-.01, .01]			-.10*	-2.06	[-.12. -.003]		
Gender	-.06*	-2.11	[-.41, -.01]			.13*	2.59	[.39, 2.92]		
Step 3				.01	7.72*				.03	12.93*
PCG Progress	.09*	2.78	[.02, .14]			-.17*	-3.60	[-1.06, -.31]		

Note. WB = well-being indicator; PCG = personality change goal; *p <.05.

General Discussion

The overarching aim of the present work was to build a bridge between Self-Determination Theory and theories of personality in order to enhance our understanding of the motivational dynamics involved in the expression of the Big Five traits when engaging in goal-directed behaviours. We are all continuously engaging in goal-directed behaviours, whether we are trying to improve our mental health in therapy, build and maintain social connections or working towards defending your doctoral thesis and building a career as a clinical psychologist. Given that goal-directed behaviour is a vitally important part of how we gain meaning and purpose in our lives, research exploring the factors that are conducive to successful goal pursuit is of the utmost importance.

McAdams' (2015) argues that dispositional traits and the motivational dynamics involved in goal-directed behaviour are both essential components of our personality structure. Indeed, McAdams put forth a three-tier model that integrates various elements of personality and provides a coherent and integrative account of personality development. This model of personality allows us to understand ourselves and others as "social actors" (i.e., our dispositional traits that describe *how* we act), the ways in which we are "motivated agents" (i.e., our personal concerns which explain *why* we act), and as the "author" (i.e., our personal narrative that describes our understanding of how and why we act over time). As previously mentioned, the three levels of personality layer and build upon on one another by adding depth and complexity to the person. Although we all have these different layers of personality, we experience ourselves as whole, complete persons, which makes it important for us to understand how the self as an actor, agent and author may overlap and interact with each other in meaningful ways. The present thesis explored the ways in which one's dispositional traits, at the first level of

personality, influences one's motivation and effectiveness in goal-directed behaviour, at the second level of personality (i.e., personal concerns). In other words, the present work explores the ways in which personality traits influence goal directed behaviours, and vice versa.

Big Five Traits and Personal Goal Pursuit

The first two articles included in this thesis explored the impact of the Big Five traits on the motivational dynamics associated with certain types of goal-directed behaviour and the subsequent progress made in these pursuits. Articles 1 and 2 provided evidence for Sheldon's (2014) self-concordance model that supports the idea that pursuing goal-directed behaviour that is concordant with one's underlying personality is beneficial for goal progress and well-being. It was hypothesized that when individuals pursue goal-directed behaviour that matches their personality traits, they are better equipped with the trait "tools" that make progress possible, which leads them to feel more autonomously motivated in their pursuits, and are subsequently more likely to achieve progress.

Article 1 examined the role of the Big Five personality traits in the pursuit of agentic and communal goals in the context of a large, multi-wave, prospective study of university students over an academic year. Providing support for the trait-goal matching hypotheses, the relations of Conscientiousness with progress on agentic goals, and of Extraversion with progress on communal goals, were confirmed, as were links with goal-specific indicators of autonomous motivation. Structural equation modeling analyses highlighted the unique links between conscientiousness and agentic goal motivation, and between extraversion and communal goal motivation. In other words, a highly conscientious individual who is organized, responsible, and

reliable would feel more autonomously motivated and make more progress when pursuing agentic goals, which emphasize self-expansion, achievement, and mastery of the environment. On the other hand, an extraverted individual who is sociable, outgoing and socially confident, would feel more autonomously motivated and make greater progress when pursuing communal goals, which emphasize creating, maintaining, and/or improving interpersonal relationships.

In Article 2, a longitudinal study was conducted which extended the trait-goal matching hypotheses of Article 1 to the real-world exploration of how the Big Five Traits related to the motivational dynamics involved in engaging in the goal-directed, health-promoting behaviour of social distancing. The pandemic brought forth the unique opportunity to test how Self-Determination Theory and the concordance between goal-directed behavior and personality could be tested on a large-scale goal that was shared by the population and that could benefit the state of public health at large. Due to this "emergency goal" of social distancing being shared by virtually everyone in the population, this allowed for the examination of the trait-goal matching hypothesis in a situation where some of the variability in goal type could be controlled for. In Article 1, the goals had been coded as being agentic or communal in nature, however, there was still variability in the specific content of the goals being pursued. It is possible that slight variations in the type of goals that fell under the umbrella of agentic and communal goals require slightly different trait tools. For example, goals related to wanting to be more assertive while in work meetings and making more friends at school would both be coded as communal goals because they both involve goal-directed behaviour within interpersonal relationships. However, being more assertive at work would involve enacting the social dominance facet of extraversion, whereas making friends would more likely require the sociability facet of extraversion. The pandemic offered the exciting opportunity to explore the influence of the Big 5 Traits on a goal-

directed behaviour that was shared by almost everyone. Excitingly, the results of Article 2 confirmed that individual personality differences in conscientiousness and agreeableness, which promote collaboration and cooperation with others, oriented individuals toward more community aspirations and predisposed individuals to feeling more autonomously motivated to comply with the COVID-19 health recommendations. A methodological strength of this study was that the link between participant's level of conscientiousness and agreeableness and their social distancing behaviour was confirmed using informant (i.e., friend and family) reports. These results enhance our understanding of individual differences associated with better internalization and adherence to public health guidelines and can inform future interventions in similar world crises.

Overall, a key implication of the findings from Article 1 and 2 is that, when selecting goal-directed behaviour to pursue, an individual would benefit from reflecting on their underlying personality and choosing goals that are consistent with and supported by their underlying traits. For example, when considering an appropriate career path for yourself, if you are someone who is more extraverted and are highly sociable, energetic, and socially dominant, a career that involves many daily social interactions, such as being an elementary school teacher, could be a good fit for you. In contrast, someone who is highly introverted and is more quiet and reserved, may experience more difficulty and challenge when pursuing a highly sociable career. The authors of the previously discussed motivational model of life span development (Heckhausen et al., 2010; 2019), which highlights the importance of the transition from the deliberative goal selection phase to the implemental goal pursuit phase of a goal action sequence, note that it is not possible for individuals to strive for all goals at once (even sequentially); this means that individuals must be selective about which goals they invest in and ought to focus

their energize on goals where success is most likely to be achieved. Therefore, matching the content of one's goals to one's predominant Big Five Traits reflects a form of goal selectivity that may serve to optimize goal pursuit.

An important caveat highlighted by Sheldon (2014) was that, in certain cases, goal-trait matching may not be advantageous. For example, Sheldon (2014) argues that, if someone is high on neuroticism, meaning they are emotionally unstable, insecure, and vulnerable, they would likely benefit from pursuing goals that suppress, rather than further express, their neuroticism. Taking this further, it may be generally wise to caution against choosing goal-directed behaviour that is consistent with the less socially desirable end of all the Big 5 Traits (e.g., personal goals that are consistent with low agreeableness). Moreover, Self-determination Theory's fifth mini theory, Goal Contents Theory, posits that there is an is empirically supported distinction between intrinsic and extrinsic values and life aspirations (Ryan & Deci, 2017). Aspirations and values could be categorized as another aspect of personality that would be part of the second layer of McAdams' (2015) model of personality (i.e. personal concerns). Intrinsic values and aspirations are related to personal growth, community contributions and meaningful relationships, whereas extrinsic aspirations are those related to wealth, fame and social image(Ryan & Deci, 2017). Past research has established that placing more importance on and pursuing personal goals and life aspirations that are intrinsic, rather and extrinsic is associated with more autonomous goal motivation and positive mental health indicators (Hope et al., 2019; Kasser & Ryan, 1993; 1996). Essentially, Self-Determination Theory's Goal Contents Theory highlights that not all values are created equal and that certain aspirations and values are more salubrious than others (Ryan & Deci, 2017). Therefore, people who have more extrinsically-oriented values perhaps ought to choose goals that contradict their underlying values in favor of more intrinsic ones. In sum, when

considering the role one's underlying personality in the pursuit of goal-directed behaviour, it's important to be mindful and primarily consider goals that are in line with the parts of the self that are more adaptive and salubrious. Future research is warranted to explore other aspects of our personality where goal-personality matching is advantageous.

Volitional Personality Change

Article 1 and 2 confirmed that one's standing on the Big Five traits can have important implications for one's effectiveness when engaging in goal-directed behaviour. However, the question then becomes: What if individuals are pursuing important and meaningful personal goals that are not concordant with their underlying personality traits? Are individuals capable of intentionally changing their standing on the Big Five traits if it is not conducive to making progress on their personal goals? Article 3 built upon recent research on volitional personality change by conducting two longitidunal studies, with both a sample of university students and a sample of non-student community adults. Moreover, Article 3 utilized an alternate goal-assessment method that was designed to capture individuals with meaningful goal intentions to change their personality traits, rather than those with passive desires to change. Returning to McAdams' (2015) model of personality, Article 3 explored whether individuals can change their standing on the Big Five Traits on the first layer of personality (dispositional traits) by setting a personal goal to do so at the second level of personality (personal concerns). Self-Determination Theory was incorporated to explore the extent to which volitional personality change pursuit reflects truly 'volitional', autonomous motivational processes. Optimistically, the first study of Article 3 provided evidence that university students were able make progress on their personality

change goals over the course of an academic year and that this progress was associated with improved psychological well-being. Moreover, autonomous motivation for their personality change goal pursuit was found to be predictive of more personality change goal progress. The second study in Article 3 replicated the motivational findings of study 1 within a sample of community adults, and found evidence supporting the validity of the proposed longitidunal goal-setting paradigm. Overall, Article 3 contributed to current volitional personality change literature by using an alternate goal-assessment method and integrating Self-Determination Theory to enhance our understanding of motivational dynamics involved in volitional personality change.

The path towards personality trait change that is explored in Article 3 describes a "top-down" process whereby the individual intentionally generates and pursues a goal to specifically change their personality. Consistent with Whole Trait Theory, presumably in pursuit of this type of top-down personality trait change, one would need to engage in behaviours where the relevant traits would be enacted and they would need to exercise that specific "trait tool". Eventually that trait tool would be further honed and acuminated, and become integrated with the person and could be an available trait resource for future goal pursuit. For example, if an individual has a goal to become more extraverted, in pursuit of this change, they would need to intentionally put themselves in situations where the facets of extraversion (e.g., being sociable, fun-loving, talkative and assertive) would be expressed, such as attending more social gatherings, or asserting themselves more regularly in work meetings. Eventually, the person would integrate the trait tools associated with extraversion into their personality and pursuing these more socially-oriented goals would become more easy and natural for them. An implication of Article 3 is that this would especially be the case if the individual is pursuing the personality change goal for autonomous reasons. Thus, if an individual is autonomously motivated for an important

goal that is non-concordant with their personality, the results of Article 3 suggest it is possible to first set an autonomous goal to alter their personality to be more in line with their important goals. The idea is that, once their personality has been altered to be more concordant with the autonomous goal, the individual will then eventually able to achieve those goals more readily, as demonstrated in Article 1 and 2.

An interesting direction for future research would be to explore whether there is also a "bottom-up" process towards personality change whereby the individual experiences change on relevant traits in pursuit of important and meaningful personal goals. For example, if an individual is pursuing a career goal of becoming a doctor and would like to gain entry to an esteemed medical training program, they will likely need to enact characteristics that are consistent with the trait of conscientiousness (e.g., being hardworking, reliable, persevering). Implications from Article 1 and 2 would suggest if the person is already highly conscientious, this goal is more likely to be autonomous, and perceived as more easy and natural for this individual to pursue from the start. In contrast, someone lower on conscientious would find the goal less easy and natural and likely face greater challenges in their pursuit. Overtime, through enacting your conscientious "trait tool" resources, it will be easier for the individual to behave more conscientiously and they would score higher on trait conscientiousness. Recall that according to McAdams' model, dispositional traits are how one "acts", therefore if someone is consistently working towards goals that require conscientiousness they are "acting" more conscientious and it could be theoretically integrated with the person over longer periods of time and generalize to other types of goal-directed behaviour.

What leads an individual to pursue a personality change goal? Research on personality change goals has found evidence that it's generally people at the less socially desirable end of

each bipolar Big Five Trait dimension, and those who are discontented with their performance in a particular domain, who have trait change goals (Hudson & Fraley 2016b; Hudson & Roberts, 2014; Hudson et al., 2020); this suggests that it is likely people who feel that their personality gets in the way of their life goals and aspirations who set personality change goals to begin with (Hudson & Fraley, 2016b; Hudson & Roberts, 2014; Hudson et al., 2020). Evidence from Article 1 and 2 demonstrated that individuals are more autonomously motivated for and make greater progress on goals where there is a match between the content of one's personal goals and one's standing on relevant Big Five Traits. Article 3 provides optimistic news for individuals who are pursuing important and meaningful life goals for which their personality is not optimally matched, in that it found that individuals are capable of intentionally changing their personality by pursuing personal goals to do so. Taken together, these findings suggests that when one is dissatisfied with their personality or is pursuing an important and meaningful goal for which their underlying traits are not well-matched, this can prompt a desire to change their Big Five traits. Therefore, there may be a process whereby an individual is pursuing an important life goal for which their personality is not well-matched (e.g., an individual low on extraversion wanting to find a life partner), this leads them to set a goal to change their personality trait (e.g., *I want to be more sociable and outgoing*), which leads them to pursue sub-goals where that trait will regularly be enacted (e.g., *attend more social gatherings, join dating applications where I will interact with more potential suitors*), and it is from this goal pursuit that personality trait change occurs. The individual will begin to enact behaviours associated with the targeted trait more frequently, and these trait-related behaviour may become integrated with the self over time, which would theoretically help them with the personal goal they are pursuing.

The findings of Article 1 and 2 would suggest that goals that are non-optimally matched for one's goal pursuit would be less autonomously motivated, which may raise the following question: why would pursuing goals for which my personality is not well-matched prompt a desire to pursue personality change goals if they are less autonomous? Also, if personality change goals arise from less autonomous goals that are not well supported by one's underlying personality traits, why was it found in Article 3 that personality change goals appeared to be more autonomous than other types of goal pursuit? As was highlighted in the introduction, one's personality comprises several different elements (e.g., dispositional traits, personal goals, values, life narratives), which means that there are different ways in which matching the content of one's personal goals to other features of their personality can be conceptualized and researched (Sheldon, 2014). Revisiting McAdams' (2015) model, the focus of the present work was to explore the influence of personality traits (layer 1 of personality termed 'dispositional traits') on one's personal goals (second layer of personality termed 'personal concerns'), and vice versa. However, one could also explore the interaction between one's personal goals and other aspects of personality at the second layer of personality, such as one's values and aspirations, or one's personal narrative (at the third level of personality). Therefore, it is plausible that, even if the content of one's personal goals is non-concordant with their underlying dispositional traits, it's possible that the goal can be concordant with other aspects of personality, leading the goal to be internalized as meaningful and important and autonomously motivated. Perhaps personality trait change goals are prompted when one's personal goals are non-concordant with their underlying personality traits, but still concordant with other aspects of one's personality. Even if the person does not have the appropriate "trait tools", which would make the goal feel more autonomous, easy and natural, because the goal is in line with other aspects of their personality, they will

likely be motivated to seek out the appropriate traits tools, and will thus set personality change goals.

To better illustrate this idea, consider once again Self-Determination Theory's Goal-Content Theory, which distinguishes between intrinsic and extrinsic values and life aspirations (Ryan & Deci, 2017). Recall that past research has established that placing more importance on and pursuing personal goals and life aspirations that are intrinsic, rather than extrinsic is associated with more autonomous goal motivation and positive mental health indicators (Hope et al., 2019; Kasser & Ryan, 1993; 1996). In instances where a goal does not match one's traits, one might still feel autonomous motivation if the goal is concordant with intrinsic aspirations and values that the person holds. For example, if an individual who is low on conscientiousness is pursuing a non-concordant agentic goal (e.g., gain acceptance intro a prestigious medical school), this goal may be concordant with their intrinsic values (e.g., contributing to and helping those in their community), which will lead the goal to still be autonomous. Seeing as this goal is consistent with the individual's important life values, they could be motivated to pursue a conscientiousness-related trait change goal in an effort to seek out the necessary conscientious trait tools. In this case, it is hypothesized that individuals would still be at least somewhat autonomously motivated in such goal pursuits and would try to persevere and pursue personality change goals to better try and align with their goals. An interesting direction for future research would be to deepen our understanding of the way in which concordance between various aspects of one's personality relates to the prompting of goals to change one's standing on the Big Five Traits.

Self-Determination Theory as a Framework for Personality Theory

As discussed in the introduction, a special issue of the Journal of Personality considered whether Self-Determination Theory can serve as a foundation, or "grand theory", for personality researchers (Sheldon & Prentice, 2019). Recall that, in support of this notion, Sheldon and Prentice (2019) argued that Self-Determination Theory provides important conceptual tools for personality theory to understand positive change and development, and the role that individual differences in personality may play in goal-directed behaviour.

The articles in the present study lend evidence to Sheldon & Prentice's (2019) proposal that Self-Determination Theory could serve as a foundational framework for personality psychology. Elaborating further, dispositional traits describe "how" we act and by integrating concepts from Self-Determination Theory, such as the relative autonomy continuum, we can enhance our understanding of "why" we act in certain ways in various situations. In other words, from the present work we can better understand how and why certain Big Five traits are expressed in pursuit of specific kinds of goal-directed behaviour and how this facilitates goal pursuit. Indeed, Article 1 and 2 highlight that when one is pursuing goals that better match and are supported by one's underlying personality traits, they tend to perceive this pursuit as more easy and natural, and will be more effective at enacting the "trait" tools that make goal pursuit possible. Additionally, from the present work we can understand how goal-directed behaviour influences one's standing on and expression of the Big Five traits. Article 3 sheds light on the ways in which the motivational dynamics involved in goal-directed behaviour can lead to potentially long-term changes in one's standing on the Big Five traits, which can subsequently impact one's future goal pursuits.

Limitations and Future Directions

There are many theoretical and methodological strengths to the three articles included in the present work, such as (1) how it integrates empirically supported theories of motivation and personality, (2) its robust methodology that consists of 8 multi-wave, prospective longitudinal studies, (2) use of large sample sizes, (3) the inclusion of friend and family informant reports in Article 2, and (4) the use of a non-college student sample in Article 3 to replicate key findings. That being said, there are limitations to the present work that are important to note, such as (1) reliance on a correlational, rather than experimental, design, (2) homogeneity of participants, (3) general reliance on self-report assessment of key variables (except Article 2 which replicated key findings using friend and family informant reports).

The studies included in the present work were not experimental; thus, the research presented in this thesis remains correlational and firm inferences about causality cannot be drawn. That being said, the field of personality research does typically rely on correlational methods. Additionally, it would likely be especially challenging, and potentially unethical, to answer the research questions included in the present work using experimental methods. For example, it would not be ethical to manipulate an individual's personality in order to explore the impact of personal goal pursuit, nor would it be ethical to manipulate participants' desires to change their personality. While it's important to consider the limitation that the present work lacked an experimental design, I maintain that the longitudinal, correlational design used to explore the various research questions in this thesis is an effective and appropriate framework for studying the bidirectional relation between personality traits and goal-directed behaviour.

Moreover, the majority of the participants recruited in the present studies were Caucasian students who were currently attending a prestigious North American University. Indeed, Article 1, 2 and the first study in Article 3 were conducted using samples of university students that were disproportionately female. The second study in Article 3 replicated the key findings of the first study in a sample of non-student community adults, with an almost even split between male and female participants. The homogeneity of participants included in the present work does somewhat limit the generalizability of the present findings to other populations. In terms of the ethnic and cultural diversity of the sample, across the majority of the studies approximately half (40-50%) of participants indicated that they identified as belonging to ethnic minority groups, with the exception of 83.5% of the sample from study 2 indicating they were Caucasian. Thus, replication of the present findings using samples with more diverse cultural backgrounds is warranted. However, several studies have confirmed the universality of several of the key concepts in Self-Determination Theory, which suggests that the findings in the present work would generalize to more diverse populations and ethnicities (Jang et al., 2009; Nalipay et al., 2020).

In addition, the primary method of data collection was the distribution of online, self-report questionnaires to participants, with the exception of the Article 2 which replicated key findings using friend and family informant reports. There are several advantages to using self-report measures, such as 1) the ability to capture participants subjective mental and emotional experiences that would be otherwise difficult (or impossible) to assess, 2) provides a cost-effective method of data collection, 3) the ability to be completed online, which allows researchers to reach respondents over large geographical areas that they would otherwise not have access to, and 3) supports the anonymity of study participants. These advantages have led

self-report methods to quickly rise as one of the primary methods of construct assessment in social and personality psychology research (Paulhus & Vazire, 2007). That being said, the use of self-report methodology is associated with a few noteworthy issues and disadvantages. For example, self-report measures can lead to the introduction of response biases, such as responding in a socially desirable, acquiescent (i.e., tendency to agree with statements regardless of the content) or extreme (i.e., tendency to choose the extreme options on a ranking scale) fashion (Paulhus & Vazire, 2007). Future research should strive to develop and incorporate more objective alternative data collection methods to attain more objective measures of the core constructs, which would allow for further confidence in these findings.

Of note, two out of four data sets that had been included in Study 1 of Article 3 (volitional personality change) overlap with the two data sets that were used in Article 1 (study exploring the influence of the Big Five Traits on agentic and communal personal goals). Even though there was some overlap, only approximately 20% of goals in each data set were coded as being personality change goals; therefore, only a small subset of the goals that were used in Article 1 were also used in Study 1 of Article 3. Furthermore, Study 1 in Article 3 incorporated an additional two other data sets into the analyses, which means that there was not a total overlap in the goals in each study. Moreover, the research questions pursued in both studies were different. The first study looked at how the Big 5 Traits influence one's motivation for and progress made on agentic and communal goals, whereas Study 1 of Article 3 explored whether there is evidence that progress can be made on a particular type of goal as well as the role of autonomous motivation in this endeavor. Encouragingly, Study 2 of Article 3 on volitional personality change replicated the motivational findings of the first study of Article 3. Additionally, progress made on personality change goals in Study 2 of Article 3 was correlated with changing on the specific

traits where participants had a goal to change, which provides evidence that (while we cannot confirm causation) we are capturing goals that are indeed associated specifically with personality change. Lastly, both studies pursued and confirmed the hypothesis that greater autonomous motivation would lead to greater progress. Seeing that autonomous motivation has been consistently found to be associated with positive outcomes of goal pursuits (Koestner et al., 2006; Koestner et al., 2002; Sheldon & Elliot, 1998; Werner et al., 2016), autonomous motivation for goal pursuit would be expected to be predictive of goal progress regardless of goal type. The key points to take away from the motivational findings of this thesis are: 1) that a match between one's personality traits and the content of one's goal is predictive of greater autonomous motivation for goal pursuit (Article 1), 2) that personality change goal pursuit is a seemingly autonomous endeavor (compared to other types of goal pursuits) and that autonomous motivation for personality change goal pursuit is once again predictive of progress (Article 3). Overall, there is no substantial reason to believe that the overlap in data sets used in Article 1 and Study 1 in Article 3 takes away from the novelty and confidence that one can have in the findings of the present work.

Final Conclusion and Summary

The first two articles included in this thesis explored the impact of the Big Five Traits on the motivational dynamics associated with certain types of goal-directed behaviour and the subsequent progress made in these pursuits. Articles 1 and 2 provided evidence for Sheldon's (2014) self-concordance model that supports the idea that pursuing goal-directed behaviour that is consistent with one's underlying personality is beneficial for the quality of one's motivation

and effectiveness when engaging in goal-directed behaviour. Article 1 examined the role of the Big Five personality traits in the pursuit of agentic and communal goals in the context of a large, multi-wave, prospective study of university students over an academic year. In Article 2, a longitudinal study was conducted which extended the personality-goal matching hypotheses of Article 1 to the real-world exploration of how the Big Five traits related to the motivational dynamics involved in engaging in the goal-directed, health-promoting behaviour of social distancing. Overall, the findings from the first two articles provides evidence that when individuals pursue goal-directed behaviour that matches their personality traits, they are better equipped with the trait 'tools' that make progress possible, which leads them to feel more autonomously motivated in their pursuits, and are subsequently more likely to achieve progress.

The third article included in this work explored the influence of goal directed behaviour on individual's Big Five traits over time. Seeing as Article 1 and 2 provided evidence that a match between one's personality traits will impact one's ability to be effective in the pursuit of certain goals, the aim of article 3 was to explore the following research question: 1) If people experience a mismatch between their personality traits and the content of their important and meaningful personal goals, are they capable of achieving trait change by intentionally setting a goal to do so? This work builds upon recent research on the pursuit of personality change goals by using an alternate goal-assessment method that distinguishes desires to change from meaningful goal intentions. Moreover, Self-Determination Theory's concept of the relative autonomy continuum was incorporated to enhance our understanding of whether volitional personality change is truly 'volitional' and how that relates to progress over time. The first study of Article 3 provided evidence that university students were able make progress on their personality change goals over the course of an academic year and that this progress was

associated with improved psychological well-being. Moreover, autonomous motivation for their personality change goal pursuit was found to be predictive of more personality change goal progress. The second study in article 3 replicated the motivational findings of study 1 within a sample of community adults, and found evidence supporting the validity of the proposed longitidunal goal-setting paradigm. Overall, Article 3 contributed to current volitional personality change literature by using an alternate goal-assessment method and integrating Self-Determination Theory to enhance our understanding of motivational dynamics involved in personality change.

The present work lends evidence to Sheldon and Prentice's (2019) proposal that Self-Determination Theory could serve as a foundational framework for personality psychology because it can provide important conceptual tools for understanding positive personality change and development. Indeed, the three articles included in the present thesis speak to the benefits and importance of building bridges between Self-Determination Theory and theories of personality to enhance our understanding of factors that are conducive to successful goal-directed behaviour and volitional personality change. We are all continuously engaging in goal-directed behaviour, from the time of our first breath, all the way to our last. By conducting research on factors that are conducive to successful goal-directed behaviour and personality development, we equip ourselves with the knowledge that can help us be more effective in our day-to-day life and pursue goal-directed behaviour that will help us gain meaning and direction in our lives.

General References

Ai, P., Liu, Y., & Zhao, X. (2019). Big Five personality traits predict daily spatial behavior: Evidence from smartphone data. *Personality and Individual Differences,* 147(October 2018), 285–291. https://doi.org/10.1016/j.paid.2019.04.02

Bakan, D. (1966). The duality of human existence: Isolation and communion in Western man. Boston: Beacon.

Baranski, E. N., Morse, P. J., & Dunlop, W. L. (2017). Lay Conceptions of Volitional Personality Change: From Strategies Pursued to Stories Told. *Journal of Personality*, *85*(3), 285–299. https://doi.org/10.1111/jopy.12240

Björgvinsson, T., Kertz, S. J., Bigda-Peyton, J. S., McCoy, K. L., & Aderka, I. M. (2013). Psychometric Properties of the CES-D-10 in a Psychiatric Sample. *Assessment*. https://doi.org/10.1177/1073191113481998

Bogg, T., & Roberts, B. W. (2004). Conscientiousness and Health-Related Behaviors: A Meta-Analysis of the Leading Behavioral Contributors to Mortality. *Psychological Bulletin, 130*(6), 887–919. https://doi.org/10.1037/0033-2909.130.6.887

Bono, J. E., & Vey, M. A. (2007). Personality and emotional performance: Extraversion, neuroticism, and self-monitoring. *Journal of Occupational Health Psychology*, 12, 177–192.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. In *Canadian Psychology*. https://doi.org/10.1037/a0012801

DeYoung, C. G. (2015). Cybernetic Big Five Theory. *Journal of Research in Personality, 56*, 33-58. doi:10.1016/j.jrp.2014.07.004

Diener, E., Emmons, R. A., Larsem, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*. https://doi.org/10.1207/s15327752jpa4901_13

Diener, E., Fujita, F. (1995) Resources, Personal Strivings, and Subjective Well-Being: A Nomothetic and Idiographic Approach. *Journal of Personality and Social Psychology*, 68, 926-935.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.125.2.276

Emmons, R. A. (1986). Personal Strivings. An Approach to Personality and Subjective Well-Being. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.51.5.1058

Emmons, R. A. (1992). Abstract Versus Concrete Goals: Personal Striving Level, Physical Illness, and Psychological Well-Being. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.62.2.292

Emmons, R. A. (2004). Personal goals, life meaning, and virtue: Wellsprings of a positive life. In *Flourishing: Positive psychology and the life well-lived.* https://doi.org/10.1037/10594-005

Emmons, R. A., & McAdams, D. P. (1991). Personal strivings and motive dispositions: Exploring the links. *Personality and Social Psychology Bulletin*, 17, 648-654

Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford Press.

Fleeson, W. & Jayawickreme, E. (2015). Whole Trait Theory. *Journal of Research in Personality,* 56, 82-92.

Graziano, W.G. & Eisenberg, N. (1997) Agreeableness: A dimension of personality. In R. Hogan, J. A. Johnson & S. Briggs (Eds.), Handbook of personality psychology, San Diego, CA: Academic Press, 795-824.

Gollwitzer, P. M. (2012). Mindset theory of action phases. In *Handbook of Theories of Social Psychology: Volume 1*. https://doi.org/10.4135/9781446249215.n26

Gollwitzer, P.M, Achtiziget, A. (2008) Motivation and Volition in the Course of Action. *Motivation and actio*, 272-295

Gollwitzer, P. M., Heckhausen, H., & Steller, B. (1990). Deliberative and implemental mind-sets: Cognitive tuning toward congruous thoughts and information. *Journal of personality and social psychology, 59*(6), 1119.

Gorin, A. A., Powers, T. A., Koestner, R., Wing, R. R., & Raynor, H. A. (2014). Autonomy support, self-regulation, and weight loss. *Health Psychology*. https://doi.org/10.1037/a0032586

Greischel, H., Noack, P., & Neyer, F. J. (2016). Sailing Uncharted Waters: Adolescent Personality Development and Social Relationship Experiences During a Year Abroad. *Journal of Youth and Adolescence*. https://doi.org/10.1007/s10964-016-0479-1

Guay, F., Bureau, J. S., Boulet, J., & Bradet, R. (2021). COVID-19 illegal social gatherings: Predicting rule compliance from autonomous and controlled forms of motivation. *Motivation Science, 7*(3), 356-362. doi:10.1037/mot0000242

Heckhausen, H. (1991). *Motivation and action.* (P. K. Leppmann, Trans.). Springer-Verlag Publishing. https://doi.org/10.1007/978-3-642-75961-1

Heckhausen, J., & Heckhausen, H. (2018). *Motivation and action* [1 online resource (xv, 909 pages) : illustrations](3rd 2018. ed.). doi:10.1007/978-3-319-65094-4

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological review*, 117, 32.

Heckhausen, J., Wrosch, C., Schulz, R. (2019). Agency and Motivation in Adulthood. *Annual Review of Psychology*, 70, 191-217.

Holding, A., Hope, N.H., Harvey, B., Marion Jetten, A.S., Koestner, R. (2017). Stuck in Limbo: Motivational Antecedents and Consequences of Experiencing Action Crises in Personal Goal Pursuit. *Journal of Personality*, 85, 893-905.

Holding, A. C., St-Jacques, A., Verner-Filion, J., Kachanoff, F., & Koestner, R. (2020). Sacrifice—but at what price? A longitudinal study of young adults' sacrifice of basic psychological needs in pursuit of career goals. *Motivation and Emotion*. https://doi.org/10.1007/s11031-019-09777-7

Holding, A., Hope, N., Verner-Filion, J., & Koestner, R. (2019). In good time: A longitudinal investigation of trait self-control in determining changes in motivation quality. *Personality and Individual Differences*. https://doi.org/10.1016/j.paid.2018.11.001

Hope, N. H., Holding, A. C., Verner-Filion, J., Sheldon, K. M., & Koestner, R. (2019). The path from intrinsic aspirations to subjective well-being is mediated by changes in basic psychological need satisfaction and autonomous motivation: A large prospective test. *Motivation and Emotion*. https://doi.org/10.1007/s11031-018-9733-z

Hudson, N. W., Briley, D. A., Chopik, W. J., & Derringer, J. (2019). You have to follow

through: Attaining behavioral change goals predicts volitional personality change. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000221

Hudson, N. W., & Fraley, R.C. (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000021

Hudson, N. W., & Fraley, .R.C (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspp0000021

Hudson, N. W., & Fraley, R. C. (2016a). Changing for the Better? Longitudinal Associations Between Volitional Personality Change and Psychological Well-Being. *Personality and Social Psychology Bulletin*. https://doi.org/10.1177/0146167216637840

Hudson, N. W., & Fraley, R. C. (2016b). Do People's Desires to Change Their Personality Traits Vary With Age? An Examination of Trait Change Goals Across Adulthood. *Social Psychological and Personality Science*. https://doi.org/10.1177/1948550616657598

Hudson, N. W., Fraley, R. C., Chopik, W. J., & Briley, D. A. (2020). Change Goals Robustly Predict Trait Growth: A Mega-Analysis of a Dozen Intensive Longitudinal Studies Examining Volitional Change. *Social Psychological and Personality Science*. https://doi.org/10.1177/1948550619878423

Hudson, N. W., & Roberts, B. W. (2014). Goals to change personality traits: Concurrent links between personality traits, daily behavior, and goals to change oneself. *Journal of Research in Personality*. https://doi.org/10.1016/j.jrp.2014.08.008

Hudson, N. W., & Roberts, B. W. (2016). Social investment in work reliably predicts change in conscientiousness and agreeableness: A direct replication and extension of Hudson, Roberts, and Lodi-Smith (2012). *Journal of Research in Personality*. https://doi.org/10.1016/j.jrp.2015.09.004

Jang, H., Reeve, J., Ryan, R. M., & Kim, A. (2009). Can self-determination theory explain what underlies the productive, satisfying learning experiences of collectivistically oriented Korean students? *Journal of educational Psychology, 101*(3), 644.

Jensen-Campbell, L. A., Knack, J. M., & Gomez, H. L. (2010). The psychology of nice people. *Social and Personality Psychology Compass*, 4, 1042-1056.

Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of applied psychology*, *87*, 797.

John, O. P., Robins, R. W., & Pervin, L. A. (2008). *Handbook of personality : theory and research* (3rd ed.). New York: Guilford Press.

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research*, 2, 102–138.

Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: correlates of financial success as a central life aspiration. *Journal of personality and social psychology, 65*(2), 410-422.

Kasser, T., Ryan, R.M. (1996) Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 280-287.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.

Koestner, R. (2008). Reaching one's personal goals: A motivational analysis focusing on autonomy. *Canadian Psychologist*, 49, 60-67.

Koestner, R., Horberg, E. J., Gaudreau, P., Powers, T., DiDio, P., Bryan, C., Salter, N. (2006). Bolstering implementation plans for long haul: The benefits of simultaneously boosting self-concordance or self-efficacy. *Personality and Social Psychology Bulletin,* 32, 1547–1558.

Koestner, R., Lekes, N., Powers, T. A., & Chicoine, E. (2002). Attaining Personal Goals: Self-concordance plus implementation intentions equals success. *Journal of Personality and Social Psychology*, 83, 231

Koestner, R., Otis, N., Powers, T., Pelletier, L., & Gagnon, H. (2008) Autonomous motivation, controlled motivation and goal progress. *Journal of Personality*, 76, 1201- 1230.

Koestner, R., Powers, T.A., Carbonneau, N., Milyavskaya, M., & Chua, S.N. (2012) Distinguishing autonomous and directive forms of goal support: Their effects on goal progress, relationship quality, and subjective well-being. *Personality and Social Psychology Bulletin*, 38, 1609-1620.

Koestner, R., Powers, T. A., Milyavskaya, M., Carbonneau, N., & Hope, N. (2015). Goal Internalization and Persistence as a Function of Autonomous and Directive Forms of Goal Support. *Journal of Personality*. https://doi.org/10.1111/jopy.12093

Koletzko, S. H., Herrmann, M., & Brandstatter, V. (2015). Unconflicted goal striving: Goal ambivalence as a mediator between goal self-concordance and well-being. *Personality and Social Psychology Bulletin*, 41, 140–156.

Legate, N., Nguyen, T.-v., Weinstein, N., Moller, A., Legault, L., Vally, Z., . . . Jernsäther, T. (2022). A global experiment on motivating social distancing during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences, 119*(22). doi:10.1073/pnas.2111091119

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-Term Effects of Social Investment: The Case of Partnering in Young Adulthood. *Journal of Personality*. https://doi.org/10.1111/j.1467-6494.2010.00629.x

Levine, S. L., Holding, A. C., Milyavskaya, M., Powers, T. A., & Koestner, R. (2020). Collaborative autonomy: The dynamic relations between personal goal autonomy and perceived autonomy support in emerging adulthood results in positive affect and goal progress. *Motivation Science*.

Levine, S. L., Milyavskaya, M., Powers, T. A., Holding, A. C., & Koestner, R. (2021). Autonomous motivation and support flourishes for individuals higher in collaborative personality factors: Agreeableness, assisted autonomy striving, and secure attachment. *Journal of Personality*.

Li-Grining, C.P. (2007). Effortful Control among low-income preschoolers in three cities: Stability, change, an individual differences. *Developmental Psychology*, 43, 208.221.

Little, B. (2008). Personal Projects and Free Traits: Personality and Motivation Reconsidered. *Journal of Social and Personality Psychology Compass,* 2, 1235-1254.

Matraijt, L. Leung, T. (2020) Evaluating the effectiveness of social distancing interventions to dela or flatten the epidemic curve of coronavirus disease. *Emerging infections disease*, 26, 1740-1748.

McAdams, D.P. (2015). The Art and Science of Personality Development. New York: NY, US: Guilford Press.

McAdams, D.P., Hoffman, B.J., Mansfield, E., Day, R. (1996). Themes of Agency and Communion in Significant Autobiographical Scenes. Journal of Personality, 64, 339-377. *Journal of Personality and Social Psychology*, 110, 287-301.

McCabe, K.O., & Fleeson, W. (2016). Are Traits Useful? Explaining Trait Manifestations as Tools in the Pursuit of Goals. *Journal of Personality and Social Psychology*, 110, 287-301.

McCrae, R. R., & Costa, P. T. (1987). Validation of the Five-Factor Model of Personality Across Instruments and Observers. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.52.1.81

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60, 175–215.

McGregor, I., McAdams, D.P., Little, B.R. (2006). Personal Projects, Life stories, and Happiness: On being true to traits. *Journal of Research in Personality*, 40, 551-572.

Meng, X. L., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.111.1.172

Miller, T. J., Baranski, E. N., Dunlop, W. L., & Ozer, D. J. (2019). Striving for change: The prevalence and correlates of personality change goals. *Journal of Research in Personality*, *80*, 10–16. https://doi.org/10.1016/j.jrp.2019.03.010

Milyavskaya, M., Inzlicht, M., Hope, N. & Koestner, R. (2015). Saying 'No' to temptation: 'want-to' motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology,* 109, 677-693.

Moore, A. M., Holding, A., Buchardt, L., Koester, R. (2021). On the efficacy of volitional personality change in young adulthood: Convergent evidence using a longitudinal personal goal paradigm. *Motivation and Emotion*. https://doi.org/10.1007/s11031-021-09865-7

Moore, A. M., Holding, A. C., Levine, S., Powers, T., & Koestner, R. (2022). Agreeableness and Conscientiousness promote successful adaptation to the Covid-19 pandemic through effective internalization of public health guidelines. *Motivation and Emotion, 46*(4), 476-485. doi:10.1007/s11031-022-09948-z

Moore, A., Holding, A., Verner-Filion, J., Harvey, B., & Koestner, R. (2020). A longitudinal investigation of trait-goal concordance on goal progress: The mediating role of autonomous goal motivation. *Journal of Personality*. https://doi.org/10.1111/jopy.12508

Moore, E., Holding, A. C., Hope, N. H., Harvey, B., Powers, T. A., Zuroff, D., & Koestner, R. (2018). Perfectionism and the pursuit of personal goals: A self-determination theory analysis. *Motivation and Emotion*. https://doi.org/10.1007/s11031-017-9654-2

Muthén, L. K., & Muthén, B. O. (2012). *MPlus. The comprehensive modeling program for applied researchers: User's guide* (5th ed.).

Nalipay, M. J. N., King, R. B., & Cai, Y. (2020). Autonomy is equally important across East and West: Testing the cross-cultural universality of self-determination theory. *Journal of Adolescence, 78*, 67-72. doi:10.1016/j.adolescence.2019.12.009

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/0022-3514.81.6.1190

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across Young adulthood. *Journal of Personality*. https://doi.org/10.1111/j.1467-6494.2007.00448.x

Noftle, E. E. & Shaver, A. J. (2006) Attachment dimensions of the Big Five personality traits: Associations and comparative ability to predict relationship quality Journal of Research in Personality, 40, 179-208.

Onder, G., Rezza, G., & Brusaferro, S. (2020). Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. *JAMA - Journal of the American Medical Association*, *323*, 1775–1776. https://doi.org/10.1001/jama.2020.4683

Oosterhoff, B., Palmer, C. A., Wilson, J., & Shook, N. (2020). Adolescents' Motivations to Engage in Social Distancing During the COVID-19 Pandemic: Associations With Mental and Social Health. *Journal of Adolescent Health*, *67*(2), 179–185. https://doi.org/10.1016/j.jadohealth.2020.05.004

Paulhus, D.L., Vazine, S. (2007) The Self-Report Method. In Robins, R. W., Fraley, R.C., Krueger, R.F. (Eds.), *Handbook of Research Methods in Personality Psychology* (pp.224-239). New York, NY, US: Guilford Press.

Philippe, F. L., Koestner, R., & Lekes, N. (2013). On the directive function of episodic memories in people's lives: A look at romantic relationships. *Journal of Personality and Social Psychology*, 104, 164.

Prentice, M., Jayawickreme, E. & Fleeson, W. (2019). Integrating Whole Trait Theory and Self-Determination Theory. *Journal of Personality*, 87, 56-69.

Prochaska, J. O., Diclemente, C. C., & Norcross, J. C. (1993). In search of how people change: Applications to addictive behaviors. *Journal of Addictions Nursing*.

https://doi.org/10.3109/10884609309149692

Roberts, B. W., & Davis, J. P. (2016). Young Adulthood Is the Crucible of Personality Development. *Emerging Adulthood*. https://doi.org/10.1177/2167696816653052

Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The Power of Personality: The Comparative Validity of Personality Traits, Socioeconomic Status, and Cognitive Ability for Predicting Important Life Outcomes. *Perspectives on Psychological Science*. https://doi.org/10.1111/j.1745-6916.2007.00047.x

Roberts, B.W., Lejuez, C., Krueger, R.F., Richards, J.M. (2014) What Is Conscientiousness and How can It be Assessed? *Developmental Psychology*, 50, 1315-1330.

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*. https://doi.org/10.1037/bul0000088

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science*. https://doi.org/10.1111/j.1467-8721.2008.00543.x

Robinson, O. C., Noftle, E. E., Guo, J., Asadi, S., & Zhang, X. (2015). Goals and plans for Big Five personality trait change in young adults. *Journal of Research in Personality*. https://doi.org/10.1016/j.jrp.2015.08.002

Rueda, M. R. (2012). Effortful control. In M. Zentner & R.L. Shiner (Eds), *Handbook of temperament (*pp. 145-167). New York: Guilford Press.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization:

Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749-761.

Ryan, R.M. & Deci, E.L. (2017) Self-determination theory: Basic psychological needs in motivation, development, and wellness. New York, NY, US: Guilford Press.

Ryan, R. M., & Frederick, C. (1997). On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being. *Journal of Personality*. https://doi.org/10.1111/j.1467-6494.1997.tb00326.x

Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: The relation of goal content and regulatory styles to mental health. In J. A. Bargh & P. M. Gollwitzer (Eds.), The psychology of action: Linking cognition and motivation to behavior (pp. 7-26). New York, NY: Guilford Press.

Shakespeare, W., & Dolan, F. E. 1. (2000). As you like it. New York, N.Y., *Penguin Books*.

Sheldon, K.M. (2014). Becoming Oneself: The Central Role of Self-Concordant Goal Selection. *Personality and Social Psychology Review*, 18: 349-365.

Sheldon, K.M., Cooper, M. (2008). Goal Striving within agentic and communal roles: Separate but functionally similar pathways to enhanced well-being. *Journal of Personality*, 76: 415-448.

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

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, 76,

482– 497.

Sheldon, K. M., & Houser-Marko, L. (2001). Self-concordance, goal attainment, and the pursuit of happiness: Can there be an upward spiral? *Journal of Personality and Social Psychology, 80*, 152-165.

Sheldon, K. M., & Kasser, T. (1998). Pursuing personal goals: Skills enable progress but not all progress is beneficial. *Personality and Social Psychology Bulletin*, 24, 1319-1331.

Sheldon, K.M., Osin, E.N., Gordeeva, T.O., Suchkov, D.D., Sychev, O.A. (2017). Evaluating the Dimensionality of Self-Determination Theory's Relative Autonomy Continuum. *Personality and Social Psychology Bulletin*, 43, 1215-1238.

Sheldon, K.M., Prentice, M. (2019). Self-Determination Theory as a foundation for personality researchers. *Journal of Personality*, 87, 5-14.

Werner, K. M., Milyavskaya, M., Foxen-Craft, E., & Koestner, R. (2016). Some goals just feel easier: Self-concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences*. https://doi.org/10.1016/j.paid.2016.03.002

Sheldon, K. M., & Tan, H. (2007). The multiple determination of well-being: Independent effects of positive needs, traits, goals, selves, social supports, and cultural contexts. *Journal of Happiness Studies*, 8, 565-592.

Soenens, B., Vansteenkiste, M., & Niemiec, C. (2009). Should parental prohibition of adolescents' peer relationships be prohibited? *Personal Relationships, 16,* 507-530.

Swickert, R., Abushanab, B., Bise, H., & Szer, R. (2014). Conscientiousness Moderates the Influence of a Help-Eliciting Prime on Prosocial Behavior. *Psychology*, *05*(17), 1954–1961. https://doi.org/10.4236/psych.2014.517198

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). New York: Allyn & Bacon.

Vansteenkiste, M., & Mouratidis, A. (2016). Emerging trends and future directions for the field of motivation psychology: A special issue in honor of Prof. Dr. Willy Lens. *Psychologica Belgica, 56*(3), 118-142. doi:10.5334/pb.354

Werner, K.M., Milyavskaya, M., Foxen-Craft, E., Koestner, R. (2016). Some goals just feel easier: Self-Concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences*, 96, 237-242.

Zajenkowski, M., Jonason, P. K., Leniarska, M., & Kozakiewicz, Z. (2020). Who complies with the restrictions to reduce the spread of COVID-19?: Personality and perceptions of the COVID-19 situation. *Personality and Individual Differences*, *166*(June), 110199. https://doi.org/10.1016/j.paid.2020.110199