SELF-DIRECTED LEARNING AS A PERONALITY CONSTRUCT

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Abstract

This study, which conceptualized self-directed learning (SDL) from a personality perspective, was conducted to examine the relationships between SDL and the Big Five personality dimensions. An additional aim was to investigate whether these relationships varied across a college and university sample. An online survey was completed by a volunteer sample of 95 college and 161 university students during their first year of postsecondary school. The survey collected SDL data using the Oddi Continuing Learning Inventory (OCLI), personality data using the Ten-Item Personality Inventory (TIPI), and demographic data using a questionnaire developed by the researcher. The college and university samples were very similar with respect to descriptive statistics for SDL and personality. The most consistent SDL-personality relationship demonstrated in this study was between SDL and openness to experience, showing that SDL may overlap most with this aspect of personality. Overall, personality was a better predictor of SDL for the university group than for the college group, demonstrating that the association between SDL and personality may vary by population. There were more differences in personality and SDL based on demographic variables for the college than the university students, suggesting that demographic variables explained more variability in SDL and personality among the college than the university participants. Thus, demographic variables may be related to SDL and personality as well.

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List of Tables

Table of Contents

Chapter 1: Introduction

Self-directed learning (SDL) has been broadly, and most commonly, defined as a process through which learners take responsibility for all aspects of their own learning, including establishing learning goals, identifying learning needs, selecting learning activities, and evaluating learning outcomes (Cazan & Schiopca, 2014). Research on SDL, therefore, has largely focused on developing skills such as self-assessment of learning performance, diagnosis of learning needs, and selection of learning resources that are thought to be necessary for engaging in the SDL process (Kicken, Brand-Gruwel, van Merrienboer, & Slot, 2009). According to some of the existing research literature, however, certain personality traits may be necessary for, or at least conducive to, the acquisition of the essential SDL skills (Balaban Dagal & Bayindir, 2016). In other words, personality characteristics that predispose one to engage in SDL activities may be missing from many definitions of SDL.

This first chapter will provide background information for the topic of SDL, present the problem statement, the purpose of the current study, and a description of the research method that will be employed to address the purpose. From there, this chapter will discuss the significance and nature of the current study, as well as present the main study hypotheses. Finally, the chapter will discuss the theoretical framework on which the study is based, relevant definitions, assumptions, scope, limitations, and delimitations of the study.

Importance of SDL

Self-direction has been argued to be a necessary characteristic of lifelong learners (Abd-El-Fattah, 2010; Bolhuis, 2003). Given that continuous learning is the fundamental goal of higher education, it is not surprising that “SDL [has been called] the raison d’etre of a university” (Smith, 2016, p. 16). The focus of university has largely changed from simply

providing students with information to teaching them how to become independent learners (Smith, 2016). Evidently, then SDL is an important construct to examine, particularly among students, as it has been found to be related to academic performance. Specifically, self-directed learners tend to have higher grades (Cazan & Schiopca, 2014; Lounsbury, Levy, Park, Gibson, & Smith, 2009). In particular, it is important to determine whether SDL represents a set of skills that can be developed. Grow (1991) assumes that SDL can be taught and/or learned, and provides a stage model outlining how teachers can assist learners with the transformation from dependent learners into independent self-directed learners. Evidence has suggested that learner control is both directly related to academic success and an essential component of self-direction (Linder, 2013), so a transfer of control over the learning situation from teacher to student may have to occur if learners are to become self-directed. Research findings have demonstrated that the degree of structure with respect to the learning environment may impact learners' preparedness for SDL. Specifically, learners who lack SDL skills may require more structure improve their SDL readiness, whereas those with more developed SDL skills may benefit from a less structure learning environment (Dynan, Cate, & Rhee, 2008). Considering that some learners appear to be more prepared to engage in SDL than others, it is logical to question whether existing SDL skills explain the variability between those labelled self-directed learners and those called dependent learners. Could there be other individual differences, such as those related to personality that explains differences between those who display SDL readiness and those who do not?

Background

Oddi (1987) pointed out that, more often than not, SDL has been considered an instructional process, and self-directed learners (SDLs) have been identified as such by their

involvement in learning activities typically associated with formal schooling. Less commonly in the literature, Oddi argued, SDL has been conceptualized as a personality characteristic, or is at least dependent on certain personality factors. Much of the research has examined the relationship between SDL and the personality dimensions assessed on the MBTI, including extraversion-introversion, sensing-intuition, thinking-feeling, and judging-perceiving (Freed, 1997; Johnson, 2001; Johnson et al., 1988; Nuckles, 1997; Wilson, 1992). To a lesser extent, studies have examined how SDL relates to the big five personality factors: openness, conscientiousness, extraversion, agreeableness, and neuroticism (Cazan & Schiopca, 2014; Kirwan, Lounsbury, & Gibson, 2010; Lounsbury et al., 2009). Although it is useful to examine the SDL process to understand what it involves, it is equally important to consider SDL as a set of personality characteristics. Despite the fact that the process perspective has been the more popular approach, several theorists believe that individual differences in SDL behaviour can be attributed to personality differences. Hiemstra (2011), for example, argued that predisposition for SDL is associated with several learner qualities. Thus, it might be appropriate to define SDL as a set of personality characteristics, since these characteristics may help to explain differences in SDL propensity across individuals.

Problem Statement

Up to this point, the process perspective has been the dominant approach to studying SDL, and undeniably, it is useful for describing the tasks and skills associated with SDL. To have the ability to predict who will have the motivation to develop the skills necessary for SDL and to engage in the process of SDL, however, it will likely be necessary to examine personality variables related to or predictive of SDL. Thus, a comprehensive understanding of SDL requires an investigation of SDL from both the personality and process approaches. The limited research

on SDL as a personality dimension has yet to conclusively establish the relationships between SDL and various personality factors (Lounsbury et al., 2009). Future research is necessary to clarify the nature of this association.

Purpose

Thus, the purpose of this dissertation will be to discover personality features related to SDL. If this investigation effectively identifies specific personality variables related to SDL, then those factors could be used to predict SDL. More specifically, once personality characteristics associated with SDL can be found, individuals can be measured on those characteristics, and their likelihood of engaging in SDL activities can be predicted by the degree to which they demonstrate that personality characteristic. Furthermore, by identifying personality characteristics that relate closely to SDL, a more accurate definition and understanding of SDL can potentially be developed, as those associated personality variables could be argued to underlie or overlap with the concept of SDL.

Measurement of SDL

The two most commonly used instruments for measuring SDL are the Self-Directed Learning Readiness Scale (SDLRS) and the Oddi Continuous Learning Inventory (OCLI), although the SDLRS is the most widely used of the two (Ryan, 1998). Oddi's (1984) instrument is based on a conceptualization of SDL, which she has labelled self-directed continuing learning (SDCL), not as a process but as a personality factor. Her self-report measure consists of 24 Likert scale items that are purported to measure three underlying dimensions of SDCL: "Proactive…versus Reactive Drive, Commitment to Learning versus Apathy/Aversion to Learning, and Cognitive Openness versus Defensiveness" (Oddi, Ellis, & Roberson, 1990, p.

139-140). The OCLI has been found to have high internal consistency (Oddi et al., 1990), and the factors underlying the instrument, according to Oddi, appear to be robust (Six, 1989).

Compared to the OCLI, the SDLRS was based on a process view of SDL (Oddi, 1987). This self-report measure includes 58 Likert scales items (Hoban, Lawson, Mazmanian, Best, & Seibel, 2005), and is suggested to measure eight underlying dimensions of SDL: "openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, future orientation, and ability to use basic study skills and problem solving skills" (Guglielmino, 1977, p. ii-iii). Some research suggests that the SDLRS may measure something other than SDL (Bonham, 1991; Field, 1989), and that the underlying factors may lack replicability across samples (Straka & Hinz, 1996).

Although moderate positive correlations have been demonstrated between scores on the two instruments, supporting the contention that the SDLRS and OCLI measure the same underlying construct (Landers, 1989), other research has revealed low correlations between them, suggesting they may not actually measure the same thing (Ryan, 1998). Perhaps such findings reflect the fact that the two instruments are based on different underlying definitions of SDL. For the purpose of this dissertation, the OCLI appears to be a better choice for measuring SDL, as it has been demonstrated to have good psychometric properties and is based on a personality view of SDL.

Research Method

To examine personality characteristics that might be meaningfully related to SDL, it is important to measure both SDL and personality for a sample of individuals, and to then examine relationships between those measures. Common self-report measures of SDL and personality, for

example, the Self-Directed Learning Readiness Scale (SDLRS) and Myers-Briggs Type Indicator (MBTI), respectively, produce numerical values. Thus, a quantitative approach is practical, as it allows for the use of such popular instruments to measure the constructs of interest. Furthermore, since the relationship between these constructs is the focus of this dissertation, a quantitative approach using instruments such as the SDLRS and MBTI allows for an objective assessment of this relationship. Much of the existing research has employed both correlational analyses to examine the relationship between SDL and personality measures, as well as regression analyses to investigate the degree of variability in SDL scores accounted for by the variability in personality traits. The Oddi Continuing Learning Inventory (OCLI), rather than the more popular SDLRS, will be used to assess SDL because it was developed from the perspective that conceptualizes SDL as a personality construct (Merriam et al., 2007). Instead of the popular MBTI, a brief personality inventory developed out of the well accepted big five theory will be used to assess personality, as these measures are based on the idea that individuals can vary along the various personality dimensions; the MBTI simply classifies individuals into discrete types, thereby neglecting to measure differences between individuals of the same basic type. These instruments will be discussed in more detail in Chapter Three. Nevertheless, regardless of specific instruments used, through correlational and regression analyses, the relationship between SDL and personality should be revealed, at least for the population of interest to this study, and a better understanding of SDL as a personality attribute, will be possible.

This study will examine the relationship between SDL and various personality characteristics among first year college and university students at a shared campus in Northern Ontario. The rationale for investigating this population will be provided in a later section. For

now, it will be sufficient to mention that students who are new to postsecondary studies provide researchers with an excellent opportunity to examine those who are adequately self-directed in their learning to pursue higher learning; furthermore, the two populations (college and university) will allow for potentially interesting group comparisons.

Hypotheses

Previous studies have failed to consistently demonstrate relationships between particular personality factors and SDL, likely due to the fact that these studies have used different measures to assess other personality and SDL. Nevertheless, some relationships have been demonstrated across different studies, and can be explained by existing theoretical approaches.

It is hypothesized that both openness, which reflects a desire for novelty and change and has sometimes been labelled as intellect, and conscientiousness, which has been associated with persistence, share a moderate positive relationship with SDL (McCrae & Costa, 1996). In other words, it is hypothesized that individuals with higher scores on both openness and conscientiousness, as measured by a brief personality measure, will demonstrate higher scores on SDL, as measured by the OCLI. It is also predicted that the institutions (university and college) may differ with respect to the relationships between SDL and the personality dimensions.

Theoretical Framework

Since the purpose of this dissertation is to examine the relationship between two broad and complex constructs, SDL and personality, it is important to examine theoretical approaches to both constructs. First, theoretical perspectives on SDL will be discussed and evaluated. Then, perspectives on personality will be described and compared.

Research on SDL generally reflects one of two common approaches to SDL; the most common viewpoint conceptualizes it as a process, while the less popular approach defines it as a

personal attribute (Song & Hill, 2007). It does not make sense to consider only one or the other conceptualization of SDL, as it is likely that an understanding of the topic requires consideration of both the process of taking responsibility for one's own learning, but of the personal characteristics that reflect one's readiness for self-directed learning as well (Guglielmino, 2013). These research approaches reflect the dominant theoretical approaches to SDL.

Although numerous SDL theories of both types exist, only two popular process theories, and two well-known personality perspective theories will be discussed. Two theories of each type were selected in an attempt to provide the reader with an appreciation for the diversity among theories within each category, despite the fact that they reflect similar conceptualizations of SDL. The process perspectives to be outlined include those by Garrison and Grow. First, Garrison's (1997) process model identified three interdependent components: self-management, self-monitoring, and motivation, which offered a more comprehensive approach to SDL than previous theories by emphasizing the importance of managing the learning activities themselves, and the motivational and cognitive variables important for SDL.

Grow's (1991) Staged Self-Directed Learning (SSDL) Model, another process perspective, suggested that SDL skills are acquired in stages, and was developed as an instructor guide for teaching learners at various stages of readiness for SDL the skills necessary to do so. Grow's four-stage SDL model describes learners as moving from the first stage, where they are more or less incapable of self-direction and are reliant on the instructor, to stage four learners, who are capable of self-direction and motivated to learn.

Process approaches have their merits, especially when it comes to describing what SDL involves, but because they cannot necessarily be used to accurately predict who will be motivated to engage in lifelong learning, personality approaches need to be considered as well.

Two popular personality theories to be addressed include Brockett and Hiemstra's model, as well as Oddi's theory.

Hiemstra and Brockett's (2012) Person, Process, Context (PPC) model provides a comprehensive explanation of SDL by recognizing both the process and personality components involved in SDL, as well as the influence of learning context. Personality responsibility, which will be discussed in more detail later in this chapter, represents a main theme of this model, as it pertains to both the Person and Process dimensions of SDL (Brockett & Hiemstra, 1991). Finally, Oddi's (1984) self-directed continuing learning (SDCL) theory, which was developed to identify personality traits associated with SDL, outlined three correlated factors linked to SDL, including motivation to learn, cognitive openness, and commitment to learning. Personality perspectives provide the theoretical framework for identifying personality measures that might predispose some individuals to engage in SDL more than others. Although the process perspective can help to describe and explain what is involved in SDL behaviour, personality perspectives provide the theoretical context for studies of personal characteristics that predict involvement in SDL activities.

Personality theories are varied and plentiful, and it would be impossible to address them all in this dissertation; however, two popular approaches to personality will be discussed in terms of their contributions to the current understanding of personality. Again, two theories were selected in an attempt to provide the reader with a basic understanding of the two most popular personality theories developed, which, not surprisingly, led to the development of the two most common approaches to personality measurement. Specifically, both Jung's personality typology and five-factor theory will be examined. Jung's personality theory recognizes eight different personality types, which supposedly result from different combinations of attitudes and life

orientations (Sharp, 1987). Jung's theory deserves attention primarily because it provides the theoretical framework for one of the two most popular and frequently employed measures of personality type, the Myers-Briggs Type Indicator (MBTI) (Capraro & Capraro, 2002). However, because the MBTI classifies individuals into types that differ qualitatively, not just quantitatively, it may exaggerate differences between groups while minimizing differences within groups (Pittenger, 2005).

The five-factor theory is examined, at least in part, because it provides the theoretical framework for the other of the two most popular objective measures of personality, the Revised NEO-Personality Inventory (NEO PI-R) (Furnham, Moutafi, & Crump, 2003); however, in addition to generating one of the most popular personality measures, five-factor theory is recognized as the defining theory in its class of trait theories and among personality theories in general (Pervin, 1994). Perhaps most importantly, five-factor theory is supported by empirical evidence (McCrae & Costa, 1996). For this reason, a measurement tool developed from this model will be selected.

Personality Theory and Measurement

Jung, a renowned personality theorist of the psychoanalytic tradition, was responsible for developing a personality typology used for classifying individuals into discrete categories based on their habits (Ball, 1967). This theory is worth discussing because it is the basis for one of the most popular and extensively studied self-report measures of personality (Johnson, Mauzey, Johnson, Murphy, & Zimmerman, 2001). Jung's approach assigns individuals into one of eight personality types, created by classifying individuals by their preference for one of two poles on three bipolar dimensions: extraverted versus introverted, thinking versus feeling, and sensation versus intuition (Cook, 1969). Jung defined one pole of each dimension as rational and the other

as irrational (Sharp, 1987), essentially adding a fourth bipolar dimension to the personality typology. The meaning of these dimensions and their opposite poles will be discussed in more detail in chapter two. Although empirical evidence has provided some support for Jung's typology (Ball, 1967; Cook, 1969), type theories are often criticized, as there is an inherent problem with key assumptions underlying type theories, such as that of Jung, namely, that individuals can be assigned to distinct groups that differ both quantitatively and qualitatively, and that each group represents a fairly homogenous category. In other words, Jung's theory assumes that variability between groups will be high, whereas within group variability will be very low. The problem with assigning individuals to discrete categories is that differences between groups are likely to be exaggerated, whereas differences within groups are likely to be minimized (Pittenger, 2005).

The Myers-Briggs Type Indicator (MBTI) is a brief self-report instrument, based on Jung's personality theory, which classifies individuals into one of 16 personality types (Psychometrics, 2015). Although the MBTI is very popular and widely used (Boyle, 1995), it provides a nominal scale assessment of personality by assigning individuals into a category (Pittenger, 1993). This categorical type of measurement causes problems when it comes to understanding variability between groups, as discussed previously. In addition, it restricts the range of statistical analyses that can be performed on the data (Boyle, 1995). Although each dimension provides a continuous score as well (Pittenger, 1993), "the MBTI manual does not provide norms based on continuous scores" (Boyle, 1995, para. 13). Nevertheless, it has been found to have good internal consistency and test-retest reliability (Capraro & Capraro, 2002). Perhaps most importantly, however, insufficient evidence exists to suggest that personality type,

as indicated by the MBTI, can be used to provide a reliable and valid prediction of behaviour (Pittenger, 1993).

McCrae and Costa (1996) present an alternative theory of personality, Five Factor Theory (FFT), based on the idea that traits, called basic tendencies, are the main component of our personality, and because they are biologically based, they account for the consistency in personality dimensions observed across cultures, as well as the stability over the lifespan. These traits, or basic tendencies, or factors, as they are sometimes called, are referred to as the *Big Five* (Goldberg, 1990), and include the following: openness, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae & Costa, 1996). McCrae and Costa's theory accounts for the differences that have been found between cultures (despite the aforementioned consistency) by distinguishing between the traits themselves (basic tendencies) and characteristic adaptations, which represent the interaction between those basic tendencies and environmental factors like culture. Characteristic adaptations, which refer to an individual's typical behaviours and attitudes, account for the differences in the ways that the biologically based traits can manifest themselves in everyday life in the same individual over time, or between two different people. Although this section presents a simplified version of a fairly complex and comprehensive theory, it provides the reader with an overall understanding of an approach to personality that will be explained in more detail in chapter two. What's particularly important to mention at this point is that considerable empirical evidence across studies, languages, and inventories has supported the robustness of the five factors identified by the FFT (Digman, 1990). For this reason, the FFT is the theoretical approach to personality measurement adopted for the purpose of this dissertation.

Although numerous instruments exist for assessing personality based on the FFT, including the NEO Personality Inventory (Form R) (NEO-PI-R), a Likert style, 60-item questionnaire and the Big Five Inventory (BFI), with 44 items, likely the most practical choice for a personality measure for this dissertation would be the Ten-Item Personality Inventory (TIPI). To measure each of the five factors of personality, this instrument has two items, one to assess each pole of the dimension. Although it does not have the psychometric properties of similar but longer instruments, the TIPI has adequate convergent and discriminant validity and test-retest reliability. The most notable benefits to using the TIPI over a longer measure are that it allows for a quicker, yet nevertheless psychometrically satisfactory, assessment of personality, and reduces the chances of participant boredom caused by redundant items (Gosling, Rentfrow, & Swann, 2003). Therefore, for the purpose of this study, the TIPI seems like an appropriate choice for measuring personality given the theoretical approach and need for concise instrument.

Definitions

The term self-directed learning (SDL) has been used interchangeably with a variety of terms with the same or similar meaning. These include: "autonomous learning, independent learning, …self-managed learning, self-organized learning, self-regulated learning, self-determined learning, self-planned learning, self-initiated learning, self-learning, self-education, self-instruction, self-teaching, autodidaxy, and autodidactic learning" (Cosnefroy & Carre, 2014, p. 1-2). The multitude of related terms makes it difficult for those investigating SDL to determine what it is, what it entails, and whether the many terms used to describe it differ subtly from one another and/or reflect different aspects of the same broader concept. To further complicate matters, the term SDL has been defined in several different ways, but most definitions "includ[e] self-initiated learning behaviours, information-seeking skills and the ability

to recognize one's own learning needs" (Mazmanian & Feldman, 2011, p. 324). In short, SDL has typically been conceptualized as a process. Less frequently, SDL has been defined "as a personality trait that is relatively enduring over time and across situations for individuals" (Lounsbury et al., 2009, p. 411). For the purpose of this dissertation, SDL will be approached from a personality rather than a process perspective.

Although many theoretical approaches to personality exist, two popular approaches, both of which generated frequently used personality measures, are Jung's personality typology, a psychoanalytic approach that classifies individuals into one of eight distinct personalities (Sharp, 1987), and the Five Factor Theory (FFT), which assumes that personality is made up of five factors or traits, including openness, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae & Costa, 1996), upon which individuals can vary and be assigned a continuous score (Pittenger, 2005).

Assumptions

The main assumption relates to the study's reliance on self-report measures for data collection. Specifically, to make conclusions based on the findings of this study, it is necessary to assume that participants are willing and able to accurately report on their own personality and SDL propensity.

Scope, Limitations, and Delimitations

For the purpose of this project, SDL will be conceptualized as an aspect of personality, not as a process. Therefore, although it should be understood that SDL can refer to a process, this investigation will not examine that process; instead, it will examine SDL as a personality trait or combination of traits on which people can vary from one another, and that potentially make some individuals more likely than others to engage in the SDL process. The rationale for defining SDL

as a personality dimension is that, if personality characteristics related to SDL can be identified, perhaps they can be used to develop a better understanding of SDL as a personality dimension and to predict propensity for SDL. To clarify,

The sample will include only postsecondary students, primarily those in their first year of study. This population is important to examine with respect to SDL because they are, for the most part, engaging in postsecondary studies for the first time. Thus, it may be one of their first opportunities to demonstrate their propensity (or lack of) for SDL. It is important to consider the limitations of restricting the study to these individuals. Although a reasonable amount of diversity can be expected among a large sample of first year college and university students, compared to the larger population, however one might choose to define it, these students may represent a relatively homogenous group because they will all be recruited from a single Northern Ontario university/college. As the majority will be in the emerging adult age group, their age range will generally be fairly narrow. For these reasons, among others, it is important to remember that results may not accurately generalize to other subsets of the larger population. Specifically, scores on both the personality and SDL measure, as well as the relationship between them, may not reflect the findings that would be obtained from the larger population or from groups with different demographics within that population. Furthermore, it is worth keeping in mind that the majority of these students, although they may have to enroll in some required courses that they lack interest in, were likely able to choose what to study. Thus, because they are engaged in learning about something that interests them, this study may result in generally high scores on the SDL measure.

Significance of Study

This investigation has the potential to reveal the relationship between SDL and the five personality dimensions most commonly demonstrated in the empirical literature. By identifying the strength and direction of these relationships, not only can an individual's SDL propensity be predicted from personality, but a better understanding of SDL as a personality construct can be developed. From a practical perspective, understanding a learner's readiness for SDL can help teachers to provide a learning environment with an appropriate level of structure, as a mismatch between learner level of self-direction and learning context has negative implications for learner success (Brockett & Hiemstra, 1991). From a theoretical perspective, a better understanding of SDL and its relationship to other constructs can help to provide clearer definitions and theories regarding SDL.

Nature of Study

Quantitative approaches to examining the relationship between SDL and personality are popular, and so this study does not offer a unique approach in that respect. The strength of the current study is that it adopts a particular theoretical approach to the study of both constructs of interest: SDL and personality, and employs a measure of each construct that has been developed from those theoretical approaches. Previous research has appeared to rely on popular measures of SDL and personality, but has not necessarily used assessments that make sense from a theoretical standpoint. For example, although the MBTI is a well-known and frequently used personality measure, it was developed from a theory that exaggerates between group differences and virtually denies within group differences. This approach to understanding between individual differences likely overlooks subtle differences between similar individuals while overestimating

differences between different personality types. For this reason, the MBTI might be an insensitive measure of individual differences in personality assessment.

With respect to SDL measurement, the SDLRS has been the most frequently used and popular tool. It is interesting to note that, from a personality perspective of SDL, the OCLI is likely a more theoretically relevant measure, as it was developed from the perspective that SDL is a personality construct. Nevertheless, this instrument has rarely been used to measure SDL, and does not appear to have been used at all in studies examining the relationship between SDL and personality. Although this research doesn't adopt a unique research method, it does attempt to employ tests that are both psychometrically sound and theoretically appropriate to the investigation of the relationship between SDL and personality.

Chapter Summary

This chapter began by introducing the topic of SDL as encompassing both a process and personality component, as this is how it has been defined and theoretically approached in the existing literature. The chapter then went on to identify a limitation of existing research on SDL, as it has more often been investigated as a process rather than as a personality construct. As a result, the relationship between SDL and personality has remained elusive, and it is difficult to determine whether one's ability and willingness to engage in SDL can be predicted by one's personality factors. The purpose of the study is to examine and thereby understand the relationship between SDL and personality. The significance of the study to improving learner's performance was briefly outlined, and the nature of the study in comparison to others with a similar purpose was addressed; specifically, while the overall approach is the same, the measures used make more sense given the theoretical frameworks discussed. Next, hypotheses about the relationship between SDL and personality were developed based on theory and past research.

Then two different theoretical approaches to both SDL and personality were evaluated. SDL was defined, and similar terms used in the literature were identified. Finally, assumptions about the reliability of self-reports, as well as the scope and limitations of the study were outlined. Next, in chapter two, SDL and personality theories will be examined in more detail, and existing empirical research on the relationship between SDL and personality will be discussed.

Chapter 2: Literature Review

As discussed in the first chapter, this dissertation examines the relationship between SDL and personality; more specifically, it adopts a personality view of SDL, and attempts to determine which personality characteristics are associated with the propensity for SDL. The goals of identifying related personality factors are to predict who will engage in SDL activities, to generate a clearer definition of SDL as a personality construct, and to develop a more comprehensive theory of SDL. It is important, however, to first understand existing theories and empirical research in the areas of SDL and personality to appreciate what needs to be done to better understand these constructs separately, as well the relationship between them. This second chapter will begin with a discussion of both process and personality theories of SDL, and will then to argue that personality approaches require further attention; in other words, this chapter will attempt to demonstrate that process perspectives are insufficient on their own. It will then outline two popular personality theories, and justify the selection of the Big Five trait theory as a suitable approach for this investigation. Finally, before moving on to chapter three, which will address methodological issues, this section will review existing empirical research on the relationship between SDL and personality.

SDL Theories

Just as definitions of SDL have focused on either the process or the personality approach to SDL, SDL theories have been grouped in several different ways, but they are often classified as either process or personality perspectives (Oddi, 1987). This section will discuss both process and personality approaches to SDL, explain why process perspectives are incomplete on their own, and argue for the importance of considering personality views. Since numerous SDL theories exist, this proposal will limit its discussion to four of them. First, two theories that

approach SDL from a process perspective will be discussed, including their strengths and limitations, and then shortcomings of process theories in general will be discussed. Next, two theories that approach SDL from the view that it is, at least partly, a personality characteristic, will be outlined. The rationale for selecting the two process theories and two personality theories to be discussed will be provided as well. Strengths and limitations of these theories will be discussed, as will the importance of recognizing personality as a potential contributor to SDL propensity.

Process theories.

Process theories provide a description of SDL, and for this reason they provide a useful guide for learners who would like to take responsibility for their own learning, and for teachers who would like to instruct learners in how to become more self-directed. It is important, though, to understand that they are generally not helpful for identifying who will pursue SDL opportunities.

The two selected for discussion here include Garrison's model and Grow's staged self-directed learning model. Garrison's model was selected because of its comprehensive approach to defining the process of learning (compared to other process theories), by recognizing external processes related to managing one's learning, like deciding what learning activities to engage in, and acknowledging the internal processes involved in learning, like cognition (Garrison, 1997). Thus, while Garrison's model is limited by its very nature as a process model, it overcomes the weaknesses of other process models that do not acknowledge the covert mental processes involved in learning. By acknowledging the cognitive processes involves in learning, Garrison's theory defines the learning process more broadly than other process theories.

Grow's model was selected for discussion because it is what one might consider a prototypical process theory. Grow believes that SDL skills develop in stages and can be taught; his four-stage model, therefore, is instructional, in that it guides instructors on how to transform learners from teacher-dependent students who lack the ability to be self-directed to independent learners who have the required skills to pursue SDL (Grow, 1991). By developing a stage-like model through which SDL skills can be developed, Grow provides a perfect example of how SDL can be defined and understood as an instructional process.

Garrison's model. The first process approach to be discussed was introduced by Garrison (1997), who developed an SDL perspective which, despite its failure to acknowledge personality dimensions of SDL, nevertheless addressed another reported weakness of many earlier theories. Specifically, Garrison (1997) recognized that previous theories emphasized "the external management of the learning process" (p. 18), but largely ignored "the learning process itself-the cognitive and motivational dimensions of learning" (p. 18). In other words, older theories explained SDL as autonomous decision-making regarding what to learn and how to learn it, but did not address factors affecting motivation or the cognitive skills required to construct meaning. To correct for these deficiencies, Garrison (1997) suggested an SDL model with three interrelated components: self-management, self-monitoring, and motivation, which thereby included "both internal and external processes and activities" (Garrison, 1992, p. 141) of SDL.

Self-management, or contextual control, refers to the learning tasks the learner engages in and how the learner makes use of the learning environment. In essence, self-management refers to the level of control the learner has over choosing learning goals and activities. Since SDL is considered a collaborative constructivist process; however, even SDLs do not generally learn entirely independently; instead, collaboration is an important component of self-management.

Ideally, teachers and learners collaborate to determine the degree of self-management appropriate for the learner, depending on learner skill level and available resources (Garrison, 1992; 1997). Communication is especially important, as teachers and peers can provide direction, support, and feedback (Garrison, 1997).

Self-monitoring (cognitive responsibility), the next dimension, refers to the learner's willingness to take responsibility for meaning construction and to use cognitive and metacognitive skills to evaluate the effectiveness of the learning process. Self-monitoring is essential for evaluating level of success in achieving learning goals and the effectiveness of learning strategies. Learner cognitive skills affect self-monitoring ability, and therefore, success of SDL efforts (Garrison, 1997). Critical thinking ability is necessary for SDL (Garrison, 1992). Since SDL is a collaborative constructive process, self-monitoring is not an entirely independent process; to be successful, learners need feedback from others, not only from internal cues, to inform them of their progress. Construction of meaning is both a personal and a social activity, so learners' own cognitive skills allow them to find personal meaning in knowledge, and collaboration with others establishes what meets the criteria for useful knowledge (Garrison, 1992; 1997).

Motivation, the final component of the model, includes two types: entering and task. Entering motivation involves a commitment to a particular goal and a plan to take action by engaging in goal-directed behaviours. Essentially, entering motivation is the drive to begin working toward a desired goal. Factors thought to affect entering motivation include valence, or a desire for specific learning outcomes, and expectancy, which reflects learner beliefs about how obtainable a particular learning goal is. It is important to understand factors that influence valence and expectancy, as these variables indirectly affect entering motivation. Valence is

affected by learners' values, needs, and preferences, which affect goal choices. Expectancy is affected by anticipated control, which is the learner's belief about their influence over the learning process. Anticipated control is largely determined by both the learner's perceived competency and aspects of the learning context, like resources and obstacles (Garrison, 1997).

Task motivation is the degree to which learners concentrate on learning goals and persist in completing learning tasks. Essentially, task motivation is the drive to continue in one's learning efforts. Although extrinsic motivation, such as external rewards and tasks assigned by others, often sustain efforts to achieve desired learning outcomes, intrinsic motivation to achieve learning goals is necessary for meaningful and lifelong learning. Thus, it is important to find ways to increase learners' intrinsic motivation (Garrison, 1997).

To fully understand Garrison's theory, the connection between its components must be examined. First, self-monitoring (cognitive responsibility) and self-management (contextual control) appear to have a reciprocal causal relationship (Garrison, 1997); research findings revealed that degree of control over the learning process affects learner willingness to assume responsibility for the construction of meaning (Abd-El-Fattah, 2010), but likely, cognitive responsibility increases the degree of control learners will exert over the learning process (Garrison, 1992; 1997). Self-management fosters motivation, and motivation further increases contextual control. That is, learners who can choose their learning goals and activities are more likely to be motivated to learn, and motivation leads learners to take control of the learning situation. Furthermore, motivation and self-monitoring share a reciprocal association, in that motivation to commit to goals and persist in learning activities affects willingness to construct meaning, and meaning construction promotes increased motivation to continue learning

(Garrison, 1997). Essentially, SDLs are motivated to assume responsibility for learning and take control of the learning process (Garrison, 1992).

Garrison's (1997) process theory of SDL is useful for describing how motivation, cognition, and context are involved together in SDL. By including cognitive and motivational dimensions, Garrison's model explains both the behavioural, or external learning process often used to define SDL, as well as the internal learning process, which many other theorists did not address. However, despite its strengths, Garrison's model is still a process approach in that it describes how SDL occurs, but does not examine the possibility that SDL has a personality dimension. Personality is not recognized as an explanation for why some people are more likely to engage in SDL than others. Instead, this model would argue that failure to learn in a self-directed manner reflects factors external to the person, like lack of contextual control, or internal factors, such as a lack of cognitive ability and/or motivation. Although these explanations may be accurate, this theory does not examine the potential influence of personality on the motivation to set learning goals and develop cognitive skills necessary for personal meaning construction.

To test the validity of Garrison's theory of SDL, Abd-El-Fattah (2010) conducted a study to examine the relationships between the components of the model: self-management, self-monitoring, and motivation, and to investigate the correlations between these components and academic performance. Participants included a volunteer sample of 119 first year undergraduate students with an average age of approximately 19 years, enrolled in an education program at a university in Egypt with an equal number of males and females, and similar numbers of arts and science majors. Participants completed an instrument designed specifically for this study, called the Self-Directed Learning Aptitude Scale (SDLAS). To generate a pool of Likert scale items for potential inclusion on the instrument, existing SDL research was reviewed. Then a panel of

experts selected 28 items to retain for the finalized measure. After participants completed the SDLAS, a factor analysis was performed on the results to examine the underlying factor structure of the instrument. Three factors that corresponded to the three components of Garrison's model were revealed. Together, these components accounted for 55% of the variance in SDLAS scores. Results of path modeling analysis demonstrated relationships between these constructs. Specifically, self-management was a significant predictor of self-monitoring, but this relationship was mediated by motivation. Overall, SDL was a significant predictor of academic performance, and more specifically, each component significantly predicted academic achievement, but self-management was the best predictor.

Grow's staged self-directed learning model. Grow (1991) developed another example of a process perspective on SDL, which is obvious in his SDL definition: "the degree of choice that learners have within an instructional situation" (Grow, 1991, p. 128). Grow's Staged Self-Directed Learning (SSDL) Model argued that the skills underlying the ability to engage in SDL develop in stages. Furthermore, the model put forth was not so much a theory of SDL as an instructional model; its function was to guide instructors to effectively teach learners at different stages in the model. Before presenting the model's stages, it is important to outline several assumptions guiding Grow's thinking. First, continuous SDL is the ultimate goal of education, and effective teachers have the responsibility of increasing learners' self-direction. Second, competent teaching comes in many forms, but requires adaptation of teaching style to the learner's degree of self-direction. Third, degree of SDL varies across situations, depending on the learner's confidence and familiarity with content (Grow, 1991; 1994). Fourth, although SDL is considered to be a mature, adult way to learn, the other end of the spectrum, dependent (on a teacher) learning is not necessarily a problem, especially early in the learning process when the

learner is unfamiliar with effective learning strategies or the content area. Finally, self-direction skills can be learned, and the teacher's role is to teach skills that will help students transition from dependence to self-directedness (Grow, 1991).

Grow (1991) outlined four stages of SDL, and for learners at each stage, he described suitable teaching strategies for teachers to use. In the first stage, dependent learners, as they are called, have minimal ability to self-direct, often due to a lack of ability or knowledge, or both. Thus, they require considerable guidance and direction from a teacher. Many learners begin as dependent learners, especially when learning about subject matter with which they are unfamiliar. According to Grow, coaching is an ideal method for teaching dependent learners, and requires the teacher to assume an authoritarian approach. Learning goals and activities should be selected by the teacher, highly structured, and clearly explained. Regular, detailed feedback and positive reinforcement, as well as objective assessments, are necessary. Teachers are seen as experts, and as such, should focus on delivering content rather than encouraging learner contributions.

Stage two, or interested, learners are motivated to complete learning tasks they consider to be meaningful; however, they require teacher assistance due to their inadequate content knowledge, which makes it difficult for them to assume control over the learning process. Teachers act as motivators, encouraging learners' enthusiasm for learning. Learning tasks, and their relevance to learning outcomes, must be explained explicitly, and the material rather than the learner, should remain the focus. Interactions between the teacher and students become more reciprocal at this stage, however. Furthermore, teachers should encourage learners to become more self-directed by moving them away from external rewards and developing their intrinsic

motivation to learn by encouraging them to examine their own learning preferences and goals (Grow, 1991).

Stage three, or involved, learners are more independent as a result of their increased knowledge and ability to think critically, but still require some guidance due to lack of experience and/or motivation. Their increased metacognitive awareness allows them to use learning strategies more effectively, and they benefit from collaboration with teachers and peers. Teachers facilitate learning by participating in the process and providing support and guidance, and assist learners in becoming more autonomous by teaching them to evaluate their own progress and set their own goals. By this stage, tasks should be less structured and learners should assume more control over the learning process (Grow, 1991).

Stage four learners are self-directed, and "are both able and willing to take responsibility for their learning, direction, and productivity. They exercise skills in time management, project management, goal-setting, self-evaluation, peer critique, information gathering, and use of educational resources" (p. 134). SDLs can learn autonomously, but often choose to learn through collaboration with others. Teachers act as consultants or delegators, whose emphasis is to develop learners' learning skills, not deliver content. The teacher remains available for consultation, and provides support, but the amount of teacher-learner interaction decreases, as learners have developed the skills necessary to self-direct by this stage (Grow, 1991).

Grow (1991) argued that learning is most effective when teaching style suits learner level of readiness for self-direction, and this has been supported by empirical evidence (Carpenter, 2011). For example, stage four, SDLs are best served by a delegator/consultant who creates an environment allowing for learner control of the learning process. Similarly, dependent learners are likely to learn most effectively from a coach who determines learning goals and clearly

outlines learning tasks. Learners are likely to experience the most difficulty when teachers do not adapt their teaching style to the needs of the learners, especially if there is a large discrepancy between teacher expectation of learner readiness for self-direction and actual learner preparedness for self-direction. For example, SDLs are likely to be frustrated by the high degree of direction and control provided by coaches, and dependent learners are likely to struggle due to their lack of motivation or knowledge when paired with consultants who assume a less involved role in the learning process (Grow, 1991; 1994).

Grow (1991) believed that SDL readiness depends on skills that don't necessarily develop without training, so teachers have the responsibility to help learners increase their readiness for self-direction. Luckily, experimental research has demonstrated that SDL skills can be developed. For example, factors related to the structure of the learning environment may influence SDL readiness (Dynan, Cate, & Rhee, 2008). Grow's (1991) perspective equated SDL with both the skills and motivation to set learning goals and engage in learning activities, but since his focus was on teaching learners to increase their level of self-direction, minimal attention was directed to the possibility that learners may differ in their predisposition to become motivated to develop SDL skills. Grow (1991), nevertheless, acknowledged that "[s]elf-direction…is not entirely situational; it is partly a personal trait analogous to maturity" (p. 127). Apparently, Grow recognized that SDL represents more than just a combination of skills that can be taught to any learner with equal ease, yet his theory did not examine personality as a source of individual differences in SDL readiness.

In an attempt to examine the validity of Grow's Staged Self-Directed Learning Model, a study was conducted to examine the relationships between self-directedness, course format (online versus face-to face), and academic performance. The study aimed to determine whether

the nature of those relationships would be in accordance with what Grow's theory would predict. The study examined 51 students enrolled in a psychology course at a Midwestern community college. The SDLRS was used to measure SDL. Findings were consistent with Grow's theory, in that those high in SDL skills performed better in the online course format, and students with lower SDL abilities performed better in the face-to-face condition. In other words, as Grow suggested, students performed better when the learning environment suited their learning abilities (Carpenter, 2011).

Tennant (1992) expressed several criticisms of Grow's Staged Self-Directed Learning (SSDL) model. First, with respect to the teaching and learning styles identified in his model, Grow contradicts himself by arguing that no teaching/learning style is better than the others, and that each is appropriate in a particular situation, while simultaneously expressing disapproval for teaching styles that do not foster movement toward further self-direction. The model doesn't indicate how teachers should progress though the teaching styles. Should they attempt to cause a discrepancy between their style and the learner's needs by moving forward more quickly than the learner to push them to become more self-directed, or should they wait until the learner demonstrates more readiness for self-direction before adjusting their teaching style? Furthermore, Grow does not provide direction as to how a learner's stage of readiness for SDL should be determined, or with respect to how a teacher should deal with students who are willing to engage in SDL but lack SDL abilities, or alternatively, who have the skills but lack the willingness. Finally, Grow fails to provide the reader with an adequate definition of SDL. He defines it as a set of skills that develop with maturity and instruction, yet children, who presumably lack maturity and adequate instruction, nevertheless demonstrate initiative and enthusiasm for learning, which are also important aspects of SDL. These criticisms suggest that

Grow's model lacks internal consistency and fails to provide an adequate explanation for empirical observations related to SDL.

Although process perspectives are useful for understanding aspects of SDL, they are limited on their own, as they focus only on the knowledge acquisition process and on the learner's ability to participate in self-instruction activities. One problem with considering SDL as solely a process is that it often leads to the assumption that individuals with extensive experience with formal schooling, who often develop skills necessary to engage in SDL, including the ability "to set goals, identify resources, and evaluate outcomes" (Oddi, 1987, p. 26), will inevitably develop into SDLs. It is, however, important to recognize that having the relevant skills does not guarantee that individuals will be motivated to engage in SDL activities. Instead, personality factors must be examined to determine who will pursue learning throughout life and who will not. Another criticism of a process perspective as a complete explanation of SDL is that it assumes that SDL relies on the ability to self-instruct. Such a definition prevents those with learning preferences other than self-instruction from being identified as SDLs (Oddi, 1987). Thus, conceiving of SDL as merely a self-instruction process defines the construct too narrowly, and somewhat inaccurately.

Personality theories.

The personality perspective endorses a broader view of SDL as a motivation to engage in lifelong learning and experience personal growth. As suggested by the name, this approach argues that personality characteristics explain the tendency of some individuals to engage (or not) in learning activities across the lifespan. Despite this argument, existing research has not adequately examined learner personality as a contributor to SDL independent of learner skills

and abilities related to self-instruction (Oddi, 1987). For reasons unknown, the process perspective has been the dominant research approach to the study of SDL.

The two personality theories of SDL chosen for discussion include Brockett and Hiemstra's Personal Responsibility Orientation (PRO) model and Oddi's self-directed continuing learning theory. First, the PRO model was chosen because of its broad approach to understanding SDL and its recognition of personality dimensions of SDL, which allow this theory to be classified, at least in part, as a personality theory. Specifically, the PRO model recognizes the importance of considering the process component of SDL, including aspects of the learning experience itself, the personality component, which encompasses individual variables that predispose certain individuals to engage in SDL more than others, as well as the interaction between the personality and process dimensions (Brockett & Hiemstra, 1991).

Oddi's theory will be discussed because it offers a prototypical example of a personality approach to understanding SDL. Oddi's self-directed continuing learning theory is based on the idea that those who differ in terms of their propensity for SDL differ on particular personality characteristics, which likely help to explain those differences in SDL readiness (Oddi, 1984).

Personal responsibility orientation model. Although less attention has been given to the personality view of SDL in the literature, some models do recognize the multifaceted nature of the construct. For example, Brockett and Hiemstra (1991) proposed the Personal Responsibility Orientation (PRO) model to offer a clearer and more complete explanation of SDL than many previous frameworks have provided. Before explaining the details of this model, it is useful to mention that, instead of SDL, this view identifies the construct by the broader term of self-direction in learning, which is composed of two separate but interdependent components: the process/method of instruction dimension, called self-directed learning (hence the need to identify

the construct by a different name), and the personality dimension, referred to as learner self-direction.

The process dimension (self-directed learning or SDL) focused "on the activities of planning, implementing, and evaluating learning" (Brockett & Hiemstra, 1991, p. 28), or, in other words, on aspects of the "teaching-learning transaction" (Brockett & Hiemstra, 1991, p. 28); these include variables external to the learner. The personal dimension (learner self-direction) referred to personality factors/internal characteristics of learners that prompt them to take responsibility for their own learning experiences. To fully understand self-direction in learning, it is essential to understand the connection between learner self-direction and SDL (Brockett & Hiemstra, 1991).

As the name of this model suggests, personal responsibility is one of its important features; personal responsibility provides the association between the personality (learner self-direction) and process (SDL) dimensions of self-direction in learning. In other words, personal responsibility is a component, to a greater or lesser degree, of both learner self-direction and SDL. When learners take responsibility for their own learning, learner self-direction is high, but when learners prefer that teachers take responsibility for controlling the process, learner self-direction is low (Brockett & Hiemstra, 1991). For many individuals, degree of learner self-direction is neither high nor low, but somewhere in between, and may even vary depending on the learning situation. With respect to SDL, situational factors affect the potential for it to occur; across learning contexts, the opportunity to engage in SDL may be high, low, or somewhere in between. A learner must take personal responsibility for learning, and a learning situation must allow an individual to assume personal responsibility for learning for self-direction in learning to

be successful. In other words, self-direction in learning requires both learner self-direction and SDL (Brockett & Hiemstra, 1991).

Furthermore, SDL and learner self-direction combine to affect learning in general, whether it is characterized by self-direction or not. When the degree of learner self-direction matches the degree to which SDL is feasible in a particular learning context, learning is most likely to be effective. A learner with less potential for self-direction in a highly structured learning environment, where the teacher controls the instructional method, is likely to learn successfully (though not in a self-directed manner), because his expectations are met by the characteristics of the learning experience. Similarly, a learner with a high level of self-direction is likely to flourish in an environment that allows for SDL. On the other hand, when the level of learner self-direction is incompatible with potential for SDL, learners are less likely to be effective. For example, learners high in self-direction whose attempts to exert control over their own learning are thwarted by the constraints of a restrictive learning environment are likely to become discouraged. Similarly, an unstructured learning environment that encourages SDL is likely to be problematic for learners low in self-direction (Brockett & Hiemstra, 1991).

Although the personal and process components of self-direction in learning are important, the PRO model introduced a third aspect to consider. Although many theories focus on the role of the individual in SDL, it is important to appreciate that learning occurs in a particular social context, and that conditions related to the environment are important to understand to appreciate the complexity of SDL (Brockett & Hiemstra, 1991; Song & Hill, 2007). For example, cross-cultural research has demonstrated that contextual variables impact development of SDL skills (Frambach, Driessen, Chan, & van der Vleuten, 2012). Unfortunately, much of the existing

research has largely ignored the social context in which learning occurs (Brookfield, 1984; Greveson & Spencer, 2005).

In response to criticisms of their original theory, and based on a more developed understanding of SDL, Hiemstra and Brockett (2012) later introduced a revised version of their original PRO model. The revised model was developed mainly to clarify the nature of the relationships between the model components and to eliminate confusion caused by the similar terms used in the initial version of the model to describe its separate components. The updated approach was referred to as the Person, Process, Context (PPC) model, and included the same components as the original model, but they were renamed to eliminate confusion. Previously referred to as learner self-direction, this component was relabeled Person, and includes internal aspects of the individual, like motivation, resilience, creativity, etc. SDL, as it was called in the original model, was renamed Process, and refers to aspects of the learning process, like "planning, organizing, and evaluating abilities" (p. 158). Finally, in the revised model, the original social context component was identified simply as Context, and considers aspects of the learning environment, such as political context, culture, etc. In this updated model, context received more emphasis than it did in the original theory, but all components were considered to be of equal importance.

The latest model by Hiemstra and Brockett (2012) is useful because it recognizes several aspects of SDL: the learning process, related personal features, and the learning context. Of course, any one of these areas could generate useful research ideas, but it is important to recognize that all aspects must be considered together to produce a complete explanation of SDL. Nevertheless, it is especially important to examine the Person component to identify traits capable of predicting SDL behaviour.

A study was conducted by Stockdale and Brockett (2011) to develop a psychometrically adequate instrument for measuring self-direction in learning based on the Personal Responsibility Orientation (PRO) model's conceptualization of SDL. In essence, this investigation provides an indirect evaluation of the PRO model itself in terms of its ability to provide an accurate understanding of SDL. Based on the opinions of a group of researchers who were familiar with the PRO model, 25 Likert scale items were selected for inclusion in the measure, called the PRO-SDLS. These items were considered appropriate because each was considered to reflect one of the four underlying factors of self-direction in learning: initiative, control, motivation, and self-efficacy. These dimensions corresponded to the instrument sub-scales. The PRO-SDLS was then administered to a convenience sample of 190 undergraduate and graduate students with an average age of 23 years, most of whom were female (58%). All participants were enrolled in an educational psychology or adult learning course at a large southeastern university in the U.S. To allow for the validity of the PRO-SDLS to be assessed, participants completed the SDLRS, a previously established SDL measure, and were assessed in terms of their SDL readiness by their professor. According to the findings, the PRO-SDLS had good internal consistency (coefficient $\alpha = 0.91$). Furthermore, according to the results of a confirmatory factor analysis, the instrument measured the four previously mentioned underlying dimensions. Good criterion-related validity was established by the ability of PRO-SDLS to accurately predict GPAs for this sample. Incremental validity was revealed for this measure, as the PRO-SDLS predicted unique variance in GPA values above and beyond that predicted by the SDLRS. Congruent validity was demonstrated by the significant relationship found between the PRO-SDLS and the SDLRS scores. Convergent validity; however, failed to be established, as there was no significant relationship between PRO-SDLS scores and professor ratings of

students' SDL ability. Overall, this study suggests that the PRO-SDLS is an adequate measure of SDL, at least for individuals who are similar in relevant ways to those in this sample. Indirectly, then, the good psychometric quality of this instrument provides support for the PRO model's ability to accurately conceptualize SDL. However, Brockett and Hiemstra (1991) did not explicitly identify the four underlying dimensions mentioned in this study.

Oddi's self-directed continuing learning theory. Recognizing a need for a more complete understanding of SDL, and for an emphasis on personality features associated with SDL, Oddi (1984) developed a theory of self-directed continuing learning (SDCL). Oddi introduced this term to distinguish her theory of SDL, which focused on personality aspects of SDL, from the more commonly held view of SDL as strictly an instructional process. Oddi assumed that those high in SDCL would have different attributes from individuals low in SDCL. Her intention was to identify observable, measurable behaviours characteristic of self-directed continuing learners (SDCLs). Based on an examination of existing literature on SDL, Oddi created a list of personality features repeatedly found to be associated with SDL. Based on their similarities and differences, Oddi categorized these traits into three clusters which, Oddi believed, reflected the three bipolar dimensions underlying SDCL: "[p]roactive [d]rive versus [r]eactive [d]rive, …[c]ognitive [o]penness versus [d]efensiveness, and …[c]ommitment to [l]earning versus [a]pathy or [a]version to [l]earning" (Oddi, 1984, p. 50). The drive dimension reflects motivation to learn; proactive drive is associated with SDCLs, who are described as independent, confident, willing to assume responsibility for their behaviours, and motivated to learn even in the absence of immediate external rewards. At the other end of the spectrum, reactive drive describes non-SDCLs, who engage in learning activities only when extrinsically motivated to do so; they are less likely to accept responsibility for learning and more likely to

have lower self-esteem. Cognitive openness, which describes SDCLs, requires open-mindedness, willingness to take risks, flexibility, and acceptance of uncertainty. The opposite end of this dimension describes non-SDCLs, who are defensive, conservative, and inflexible. Commitment to learning, characteristic of SDCLs, involves enjoyment of learning regardless of approach, whereas, at the other end of the continuum, non-SDCLs have an aversion to learning; they avoid learning opportunities and display a negative attitude toward learning. Thus, Oddi suggested, SDCLs differ from non-SDCLs on each of these dimensions, and together, these components make up the SDCL theory. Oddi further argued that the three dimensions of SDCL are interdependent. In other words, different levels of motivation to learn, open-mindedness, and enjoyment of learning interact, resulting in varying degrees of SDCL (Oddi, 1984).

A study was conducted by Oddi, Ellis, and Roberson (1990) to assess the construct validity of the OCLI. This study was chosen for discussion at this point in the dissertation because it provides indirect evidence for or against the utility of Oddi's theory for understanding SDL. Participants included 126 registered nurses employed at a community hospital in the Midwestern U.S., all of whom were female, with an average age between 36 and 37 years. Although many nurses had associate or baccalaureate degrees, almost half had diplomas, slightly more than half were employed on a part-time basis, and the average number of years of experience among them was just under 13. Participants completed a demographic questionnaire, the OCLI, and the Job Activity Survey (JAS), which measures frequency of nurses' participation in leaning activities at work. Internal consistency for the OCLI was found to be high (coefficient $\alpha = 0.90$). Convergent validity for the OCLI was supported by the significant positive correlations demonstrated between OCLI scores and scores on the JAS ($r = 0.33$). Thus, at least for this sample of nurses, the OCLI appears to provide a valid measure of self-directed

continuing learning. However, it is worth noting that the correlation between OCLI and JAS scores is low to moderate. Construct validity might be improved if items on the OCLI were revised.

Oddi's theory emphasized learner characteristics that may or may not predispose individuals to be SDCLs, and that have the potential to predict who will benefit from autonomous control of the learning process (Oddi, 1984). Indeed, research on a large sample of undergraduate and graduate students demonstrated through structure equation modelling that personality, specifically conscientiousness, had a significant effect on learner self-direction (Oliveira & Simoes, 2006). Of course, like any theory, Oddi's approach is incomplete on its own, as it does not describe the SDL process, but since many other theories do, Oddi's theory is an ideal framework to adopt if one hopes to predict lifelong learning involvement using personality characteristics.

To conclude, process perspectives are useful for understanding the internal and external activities involved in SDL, identifying contexts more or less conducive to SDL, and describing the development of skills required for SDL. Without an appreciation for the personality characteristics associated with SDL, however, it is difficult to predict who will initiate and persist in SDL opportunities, so it is important to consider personality as well as process perspectives to fully understand SDL. Although studies have been conducted on SDL as a personality phenomenon, such research has been incomplete and inconclusive (Lounsbury et al., 2009). Thus, further research on the personality construct of SDL is necessary and has the potential to generate interesting and useful findings (Caffarella & O'Donnell, 1987).

Since the dominant theoretical framework selected to conceptualize SDL in this dissertation has been explained and justified, it is important to move on to a discussion of popular theoretical approaches to the study of personality.

Personality Theories

Personality has been theorized about and empirically researched from many different perspectives, so it is next to impossible to provide a comprehensive overview of theoretical and measurement approaches to personality. This chapter will discuss two very popular theoretical frameworks: Jung's personality typology, and five-factor theory. These perspectives were selected because they underlie the two most commonly used measures used to assess personality: the Myers-Briggs Type Indicator, and the NEO Personality Inventory, Revised.

Jung's personality typology.

Jung's personality approach involves ideas about the transfer of mental energy and about individual preferences with respect to life orientation. His theory classifies individuals into eight different personality types, created from combinations of attitudes and life orientations. The attitude dimension ranges from extraverted at one extreme, to introverted at the other. Life orientation possibilities include thinking, feeling, sensation, and intuition. Extraverts assign particular importance to the external world, tend to be gregarious, blunt, confident, and adaptable, whereas introverts direct their energy inward, and tend to be thoughtful, hesitant, and distrustful. An understanding of introversion and extraversion on their own is difficult; instead they have to be interpreted as a component of the personality type. In other words, their interaction with life orientation must be understood. The life orientation refers to a way of operating, which can involve thinking (using cognitive functions), sensation (perceiving information through the senses), feeling (making subjective judgments), or intuition (perceiving

information from the unconscious). Although all functions are important to use in different situations, individuals tend to develop a relative strength in one of these areas, while the other three areas remain as relative weaknesses in comparison. As a result, they tend to demonstrate a preference for the function they have a relative strength in (Sharp, 1987).

Jung went on to classify the four functions as either rational or irrational. Rational functions, include thinking and feeling because, as Jung pointed out, "both are based on a reflective, linear process that coalesces into a particular judgment" (p. 16), whether that process leads to a decision regarding what something is (thinking) or whether one likes it (feeling). Jung identified sensation and intuition as irrational, which he emphasized "does not mean illogical or unreasonable, but rather beyond or outside of reason" (p. 17). Both involve perceiving what exists, but sensation involves perception of external reality, while intuition involves that of one's internal reality. It is useful to note that Jung identified judging to be a synonymous term for rational, and perceiving to be equivalent to irrational. This distinction reveals where Myers and Briggs got the idea to include the fourth, judging-perceiving dimension to the model, and to the personality measure (Sharp, 1987).

Likely the most confusing aspect of Jung's model is the role of the unconscious. With respect to attitude, (extraverted or introverted), the type that characterizes the individual best is supposedly conscious. Jung, however, suggests that the less characteristic attitude remains unconscious, but exerts a compensatory force on the preferred attitude type. To further complicate matters, the relatively underdeveloped functions, which appear to be part of the unconscious, may influence an individual's personality as well. Given the complexity of potentially interacting conscious and unconscious components of the personality, it is difficult to understand how personality should be conceptualized and measured from the perspective of this

theory. By comparison, the five-factor theory, discussed next, appears to provide a much clearer conceptualization of personality and how it should be measured.

Five-factor theory.

Regardless of the conceptual or methodological approach to personality adopted by existing studies in personality research, much empirical evidence suggests that the inter-individual variability in personality demonstrated by past studies can be explained by differences between individuals on five orthogonal factors; impressively, these same factors have been demonstrated in both cross-cultural and longitudinal studies. In other words, empirical evidence on different populations, using a variety of measures and procedures, has provided extensive support for the existence of what has been labelled the five-factor model (FFM). Most impressively, perhaps, evidence suggests that the FFM provides a personality system consisting of both mutually exclusive and exhaustive personality factors. Thus, this model is a useful approach to understanding personality, as it effectively accounts for differences between individuals' personalities by examining the degree to which they vary on the following five factors: openness (O), conscientiousness (C), extraversion (E), agreeableness (A), and neuroticism (N). Openness can be understood as a desire "for variety, novelty, and changes", conscientiousness reflects a "strong sense of purpose and high aspiration levels", extraversion is defined as "a preference for companionship and social stimulation", agreeableness involves "a willingness to defer to others during interpersonal conflict", and neuroticism is defined as "a tendency to experience dysphoric affect" (McCrae & Costa, 1996, p. 164).

The FFM, although it has been developed to organize empirical findings, is not a theory in itself. Essentially, on its own it is merely descriptive. A theory must attempt to explain personality rather than simply describe it; it must identify the components of the personality

system and explain how they interact. It must be capable of accounting for the development of personality and predicting outcomes related to personality. Thus, McCrae and Costa (1996) attempted to develop a comprehensive theory of personality. Their theory, called the five-factor theory (FFT) was an attempt to transform the FFM into a theory that could effectively explain personality as a system. Traits were identified as the key components of this theory, and thus, FFT can be classified as a trait theory (McCrae & Costa, 1996).

Before discussing the FFT in detail, it is useful to first define "trait" and to outline some assumptions of trait theories in general, and of FFT in particular. Traits are essentially "individual-difference variables" (p. 162). "[T]raits point to more-or-less consistent and recurrent patterns of acting and reacting that simultaneously characterize individuals and differentiate them from others, and they allow the discovery of empirical generalizations about how others with similar traits are likely to act and react" (p. 160). As mentioned, FFT is a trait theory, and so it is useful to point out that it shares several assumptions with other traits theories. For example, like trait theories, FFT assumes that individuals can be accurately described by fairly stable patterns of thoughts, feelings, and behaviours, that traits are quantifiable and measurable, and that traits demonstrate consistency across situations and contexts (McCrae & Costa, 1996).

Furthermore, FFT is based on four of its own assumptions, in addition to those it shares with other trait theories. First, it relies on the contention that personality can be studied scientifically. In other words, personality can be simplified into components that can be observed and measured. Next, it assumes rationality, or that individuals have the ability to comprehend themselves and other people. Similarly, people are assumed to be able to accurately judge personality traits; they can provide valid self-reports. Next, this theory assumes variability, or the existence of meaningful differences between people; it does not try to examine how all people

are similar, but tries to understand their differences. Finally, the theory assumes proactivity of personality, which argues that personality drives behaviour, and that people are not merely passively shaped by environmental factors (McCrae & Costa, 1996).

Now that traits, the basic building blocks of FFT, have been defined, and the assumptions underlying the theory have been discussed, it is appropriate to outline the FFT in detail. The theory has several components, and it acknowledges relevant external factors, which help to shape personality, and various dynamic processes that explain the interrelationships between the main and external components. This section will first briefly define each main and external component of the theory and then go on to explain how they relate to each other through the dynamic processes (McCrae & Costa, 1996).

The main personality "components" of the FFT include: "basic tendencies", "characteristic adaptations", and the "self-concept". The "basic tendencies" component is essentially synonymous with "traits". Traits or basic tendencies are "abstract psychological potentials" (p. 163). They cannot be directly observed by others or perceived by the self. Instead, traits are inferred characteristics about an individual based on self- and other- reports of behaviour, attitudes, etc. Next, "characteristic adaptations" are "the more observable components of personality" (p. 163), like "habits, attitudes, skills, roles, relationships". They are the "concrete manifestations" (p. 163) of the basic tendencies. Finally, "self-concept" refers to one's sense of who they are, and develops through selective perception of information about the self that is in accordance with one's personality traits (McCrae & Costa, 1996).

External components impact the operations of the main components. They are considered external to FFT as the theory does not address them specifically, but neither does it deny their existence or importance. These external components surround the personality components of the

theory and influence the expression of personality. They include the "biological bases" of personality, like genetic and brain factors that determine and impact the development of personality traits. Furthermore, "external influences", like culture and situation, affect the way traits are expressed in any given context, but according to this model, do not actually shape personality traits themselves. Finally, the "objective biography" refers to the observable outcomes of traits, such as specific behavioural outcomes. These behavioural outcomes are used by the self and others to infer the degree to which an individual possesses a given trait (McCrae & Costa, 1996).

The above sections described the main personality components of FFT, as well as the external components related to the theory. Of course, it is incomplete to discuss only the components of FFT. It is equally important to discuss the "dynamic processes", or how these components interact to produce personality. By discussing dynamic processes, one can come to understand how this theory accounts for the determination and development of personality. FFT suggests that "biological bases", or genes, are responsible for the development of traits (basic tendencies). As previously mentioned, traits are constructs, as they cannot be observed directly; rather, they translate into the observable behaviours that we then use to make inferences about the traits themselves. An important aspect of this theory is the argument that traits are not impacted by environmental factors. Instead, traits interact with external influences to produce characteristic adaptations, which are the more specific, and observable, indicators of personality. Thus, characteristic adaptations represent the component of personality that is influenced by traits, or "basic tendencies", and by external influences, such as situation and culture. Thus, characteristic adaptations are appropriately named; they are "characteristic" because they are fairly stable, and "adaptations" because they reflect an attempt to adapt to the changing

conditions of the environment. Characteristic adaptations then interact with external influences to produce the objective biography, or specific behavioural outcomes. These behavioural outcomes, or the objective biography, then shapes self-concept, as we develop a sense of who we are at least partly by our behaviours (McCrae & Costa, 1996).

This theory emphasizes the distinction between "basic tendencies" and "characteristic adaptations". This distinction is important to the theory because it allows for a separation between traits, the abstract, biologically driven components that shape personality and are not impacted by external factors, and characteristic adaptations, which are the more specific everyday examples of behaviours that are influenced by both traits (basic tendencies) and external factors like culture and context. This separation between the personality components is important, as it helps to account for both the consistency and variability of personality across culture, and both the stability and change in personality over the lifespan (McCrae & Costa, 1996).

According to FFT, the five traits identified by this theory do not vary across cultures, and empirical evidence supports this contention (i.e., Hendriks et al., 2003; Kajonius & Mac Giolla, 2017; McCrae & John, 1992). Evidence from longitudinal studies has demonstrated the stability of the five traits over the lifespan (Conley, 1985; Costa & McCrae, 1986; Roberts & DelVecchio, 2000). These findings support the notion that traits themselves are not influenced by context. If personality traits were shaped by the environment, the stability and consistency across cultures and over the lifespan that has been empirically demonstrated would likely not be seen (McCrae & Costa, 1996).

Nevertheless, despite the consistency and stability in personality that has been found, cross-cultural differences and change over the lifespan have sometimes been demonstrated by

personality research. What aspect of personality, if not the traits themselves, is shaped by culture and experience to influence the outward expression of personality? Differences in personality between cultures and changes across the lifespan are explained not by traits but by another component of FFT. “Characteristic adaptations”, which are shaped by both traits and external influences, explain why the same underlying personality constructs can appear across cultures and through the lifespan, yet present themselves quite differently in different contexts and at different times. Thus, according to FFT, it is the characteristic adaptation component of personality that allows for the differences in personality expression across cultures and over the lifespan despite support for the existence of the same underlying stable traits among individuals across cultures and over the lifespan (McCrae & Costa, 1996).

In a clever way, FFT accounts for both the stability and consistency of personality, while at the same time explaining the differences in expression of the same underlying dimensions of personality from one situation to the next. Thus, the distinction between traits and characteristic adaptations may be an excellent and accurate way to account for the empirical findings that have been gathered to date (McCrae & Costa, 1996).

Although FFT seemingly explains both the longitudinal development of personality, as well as the functioning of personality at a particular point in time, some evidence has been gathered to suggest that FFT may have its weaknesses, and therefore require some revision. Specifically, some researchers (as cited in McCrae & Costa, 1996) argue that additional factors, broader than the five factors identified, might exist, but this argument requires more evidence. Nevertheless, it is worth pursuing further. Furthermore, although FFT argues that environment does not affect traits themselves, there are in fact circumstances in which environment clearly affects traits directly, by altering their biological bases; for example, through the use of

psychotropic medications or acquired brain injuries, the brain bases of traits can be affected. Some evidence suggests that cultural context, more than ethnicity, might influence traits (as cited in McCrae & Costa, 1996). For example, some evidence has been found to suggest that individuals surrounded by a culture different from their own ethnicity (In this instance, ethnicity refers to genetic/inherited characteristics.) resemble, in terms of personality traits, the culture in which they live more than the ethnic group to which they belong (McCrae & Costa, 1996). Such findings suggest that culture may somehow influence traits themselves, which is in opposition to one of the main arguments put forward by FFT (McCrae & Costa, 1996).

Another major weakness of FFT is its inability to explain the origin or function of personality traits in the first place. From an evolutionary perspective, traits might have evolved to help individuals cope with tasks required for survival, particularly in the social realm. If it is to be assumed that traits evolved because they are adaptive, this might explain why humans are able to accurately recognize personality traits (indirectly) in themselves and others; in other words, people might simply have evolved to have traits and recognize traits because it improved the ability to socialize effectively and thereby survive. Inter-individual variability in traits might be explained by natural selection. Specifically, although extreme values on any given trait might have been largely eliminated from the gene pool of the species because they were maladaptive, some degree of variation of the five traits might have been neutral or inconsequential when it came to survival, so that variability simply remained in the genetic make-up of humans. Alternatively, it may be that different levels of the traits may allow for a greater variety of approaches to problem solving among different members of the species. In a similar fashion, variability would have allowed for more diversity within groups, so that the group members would have been less likely to all benefit from the same strength, and at less risk of all suffering

from the same personality weakness. To further complicate matters, it is possible that each trait does not translate neatly into one specific adaptive advantage, and that different traits might have different evolutionary explanations, as some may be the result of harmless (and useless) variability between individuals, and others may have been naturally selected for because of their survival value. Finally, even if traits were adaptive, it might be impossible to determine when they evolved in history, and what survival tasks they evolved to help humans solve (McCrae & Costa, 1996).

Nevertheless, despite its unanswered questions and potential limitations, FFT can be useful for predicting future behavioural outcomes. Self-and other-reports of individuals' typical behaviours, attitudes, and emotions, for example, can be used to accurately infer individuals' levels of the five personality traits. Once those traits are identified, they can be used to predict future behaviours, albeit not specific outcomes, as the specific products of personality traits could vary considerably depending on external factors. This relationship between behaviours and traits may sound like circular logic, as behaviours are used to infer traits, and then traits are used to predict behavioural outcomes, but in fact once the specific behaviours. are used to infer trait levels, those traits can then be used to predict much broader outcomes than the specific behavioural outcomes used to infer the traits in the first place. In other words, fairly specific examples of behaviour, attitudes, emotions, etc. are used to infer traits, but knowledge of where one falls on each of the traits can be used to predict a broader array of outcomes (McCrae & Costa, 1996).

Criticisms of trait theory. Although the FFM is very popular and generally well accepted, Pervin (1994) argues that the model is conceptually flawed, and not as well supported by empirical evidence as many trait theorists might believe. Pervin rejects the suggestion that traits

are determined entirely by genetic inheritance. He argues that environment may explain as much as half of the variability in personality traits. Furthermore, Pervin suggests that different traits may vary in the degree to which they are influenced by genes and the environment, respectively.

Pervin (1994) rejects the argument that personality is stable; he suggests that "there is at least as much evidence of personality change as there is of personality stability" (p. 105). He argues for individual differences in degree of stability. That being said, Pervin is not arguing against personality stability. He does, however, reject the FFM's explanation for this stability, namely, that genes account for this stability. Different parts of personality, he suggests, might be more stable than others. In other words, traits might not be the source of stability. Environment, he points out, might help to account for the stability that has been demonstrated. Pervin criticizes FFM's failure to explain what causes stability and change in the different components of the personality system. Pervin, perhaps not surprisingly given his concerns about FFM, suggests that theories from other approaches, such as the psychoanalytic perspective, might predict the stability of personality observed in research findings. In other words, he does not consider FFM to be the only model capable of accounting for the personality research findings (Pervin, 1994).

Pervin (1994) points to a lack of sufficient evidence to conclude that there are five underlying personality factors, as different approaches have argued for a different number of factors. Although he does not elaborate, he takes issue with the factor analysis procedure in general, and of course trait theories rely heavily on this method. Pervin questions whether there is sufficient agreement in terms of number and nature of traits across different personality questionnaires and data collection methods (self- vs. other-report, for example), as what qualifies as sufficient agreement is difficult to decide. In other words, the comparability of factors

resulting from factor analyses of data obtained from the different measures is in question (Pervin, 1994).

Pervin (1994) expresses some concerns about the conceptual integrity of the FFM. FFT is based on the fundamental lexical hypothesis, which argues that any meaningful individual differences found cross-culturally will be reflected in many languages by different words, which represent the various personality dimensions. Although there is considerable agreement across cultures with respect to the terms used to describe personality factors, the factors identified in different languages do not overlap perfectly. For example, while members of individualistic cultures tend to describe personality aspects using primarily "single-word adjectives", according to Pervin, individuals from collectivist cultures are more likely to describe individuals using action words, and to produce "context dependent… person descriptions" (p. 106). Furthermore, Pervin questions the relationship between the common, everyday terms used to describe personality, and the psychological constructs developed to describe the underlying personality dimensions, as these are not necessarily the same (Pervin, 1994).

Furthermore, Pervin expressed the concern that correlations between traits and behaviour measures are often less than r = .30. To appreciate the relevance of this finding, it is first important to understand that correlations of this magnitude represent weak to moderate relationships between the variables involved. Next, it is important to understand that the strength of relationship between variables determines the degree of accuracy possible when values of one variable are used to predict values of the other. Thus, since the relationship between personality and actual observable behaviours is moderate as best, personality traits may not be useful predictors of behavioural outcomes (Pervin, 1994).

In addition, Pervin (1994) argued that the trait concept itself is unclear, in that traits have been understood to encompass a variety of psychological aspects, including: “attitudes, values, desires, and …overt behavior” (Pervin, 1994, p. 108). In particular, traits and motives have often been connected by trait theorists, in that motives are often considered as one aspect of traits. Pervin (1994); however, argues that traits and motives are distinct, and that motives, although they do not always translate into overt behaviours, might sometimes help to account for behaviours that appear to be out of character for a person given their measured traits. Pervin entertains the possibility that motives may explain the cause of behaviour, while traits might describe the expression of the behaviour. This distinction between motives and traits might explain why the same motive might lead to different behaviours in different people, and why the same behaviour might be caused by different motives in different individuals (Pervin, 1994).

Furthermore, another concern, related to the previously discussed issue, is Pervin’s (1994) suggestion that it is unclear whether traits are explanatory, descriptive, or both. He argues that the FFM does not provide an explanation for the traits themselves. Furthermore, traits do not necessarily explain patterns of behaviour, etc.; instead, they simply describe these consistent patterns. A related criticism by Pervin is that trait theories are static, in that they don’t explain the dynamic functioning of the personality system. Finally, he criticizes the ironic lack of focus on the individual by FFM given its goal of explaining individual differences. Although he offers numerous specific criticisms, Pervin’s main point is that FFT should not be considered the final word on personality psychology (Pervin, 1994).

One suggested caution when considering Pervin’s criticisms of the FFM is that he presented these concerns prior to McCrae and Costa’s development of the FFT, which likely addressed some of those issues. For example, FFT attempted to explain which personality

components account for both the stability and the change observed in personality research. It provided a more comprehensive explanation of the dynamic functioning of personality as a system (McCrae & Costa, 1996).

In an attempt to understand normative changes in personality traits observed throughout adulthood, such as increases in conscientiousness, agreeableness, and emotional stability, and decreases in openness and extraversion, Roberts, Wood, and Smith (2005) evaluated and compared the FFT and the Social Investment theory as possible explanations for these developmental changes. While FFT attributes these developmental changes to genetic factors, Social Investment theory explains these changes as "the result of experiences in universal social roles in young adulthood" (p. 166).

According to Roberts et al. (2005), cross-cultural comparisons reveal consistencies in personality development throughout adulthood. They argue, however, that such normative changes are not necessarily better explained by FFT than they are by Social Investment theory. After all, these findings might very well be explained by "genetic predispositions to change in particular ways" (p. 167), as FFT suggests, but they might instead indicate that "universal tasks of social living drive personality development" (p. 169), as Social Investment theory would argue. Thus, findings from cultural comparisons could support either theory.

Findings related to developmental consistency can be used to examine the validity of both FFT and Social Investment theory. Roberts et al. (2005) point out that "a disproportionate number of individuals chang[e] reliably in the opposite direction than the general trends found in the data" (p. 169). If experience moderates the influence of genes to result in these individual differences in personality development, then FFT must be incorrect in its assertions that external factors do not affect traits themselves. However, if FFT provides an accurate explanation for

personality change, such findings might be explained by the argument that individual genetic differences result in individual differences in personality development. In other words, personality development is not universal, but is instead determined by unique genetic factors. However, according to the authors of this article, heritability estimates for personality change in adulthood are, on average, less than 30%, suggesting that environmental rather than genetic factors explain the majority of personality development in adulthood.

Roberts et al. (2005) argue that the strongest evidence in support of the argument that environment influences the development of personality over the lifespan derives from research in the area of behavioural genetics. They state that, across numerous studies, the mean heritability estimate for personality traits is approximately 50%. This suggests that the remaining 50% of variability is due to environmental factors; however, they point out that heritability estimates do not solely reflect the influence of genes on a particular characteristic because these estimates vary from one context to another. In other words, the heritability estimates for a given trait tends to vary across time, population, etc., suggesting that heritability estimates represent both genetic and environmental influences. If this is the case, the genetic contribution to personality appears to be even smaller than heritability estimates imply. To further argue for the importance of environment in personality development, Roberts et al. point to studies that reveal interactions between genes and the environment, which provide evidence of the influence of the environment on gene expression. Another area of empirical evidence that contradicts the claims of FFT is longitudinal research that links life experiences to personality change. These correlational studies fail to establish a directional causal relationship, as they cannot, on their own, establish whether life experiences caused personality changes or vice versa; however, the authors mention examples of studies that clearly demonstrate that the environment caused the personality

changes, not the way around. For example, they refer to studies in which life experiences occurred before, and therefore predicted, later personality changes, as well as research where therapies/treatments resulted in personality changes.

Thus, Roberts et al. (2005) argue that Social Investment theory, which "states that investing in social institutions, such as age-graded social roles, is one of the driving mechanisms of personality development" (p. 173), provides a better explanation than FFT for much of the empirical evidence related to personality change in adulthood. In particular, any evidence suggesting that environment shapes traits themselves would be better accounted for by Social Investment theory; however, it is reasonable to suggest that if one considers the distinction made in FFT between traits and characteristic adaptations, one may be more inclined to view FFT as the most useful personality theory. As mentioned in the discussion of FFT, environment certainly can impact the way traits produce observable behaviours by interacting with the traits themselves to produce characteristic adaptations; however, FFT maintains that the traits themselves remain unchanged. Thus, although Roberts et al. provide a good argument for the validity of Social Investment theory, they don't necessarily provide evidence that cannot be adequately accounted for by FFT.

Although FFT has been supported by considerable research evidence, it is important to remain open to the possibility that another theory might better account for the research findings related to personality. At this point; however, it is likely reasonable to conclude that FFT has earned its popularity through its superior ability to account for individual differences in personality. Therefore, for the purpose of this dissertation, it will be the model used to operationalize personality.

At this point, several influential theoretical approaches to both of the major constructs to be addressed in this dissertation, SDL and personality, have been outlined. Thus, the next section will examine existing empirical evidence that has examined the association between these two important constructs.

Studies Regarding the Relationship between SDL and Personality

In the following section, several studies will be described, compared, and contrasted because, despite their differences in terms of measures and procedures used, they were all conducted for a similar purpose, at least in part, which was to examine the relationship between SDL and personality.

The first three studies to be discussed are similar in that they all used the same measures to assess SDL and personality. Specifically, in each study, SDL was measured using the Self-Directed Learning Readiness Scale (SDLRS), and personality was assessed using the Myers-Briggs Type Indicator (MBTI). Although both measures will be discussed later in some detail, it is important to introduce them briefly at this point so that the studies that used them can be better understood.

The SDLRS is a 58-item Likert scale test developed to measure self-reported attitudes and skills related to SDL (Johnson, Sample, & Jones, 1988). Scores on the SDLRS can range from 58 to 290, with higher scores indicating increased readiness for SDL. The instrument purportedly measures eight characteristics indicative of SDL readiness, including: “love of learning”, “self-concept as an independent learner”, “ability to handle risk, ambiguity, and complexity in learning”, “creativity”, “seeing learning as an ongoing lifelong process”, “taking the initiative in learning”, “understanding one’s self”, and finally, “being responsible for one’s

own learning" (Johnson, 2001, p. 40). With a coefficient alpha of r = 0.91, this measure appears to have high internal consistency (Lounsbury et al., 2009).

The MBTI is a commonly used self-report measure of personality, and is based on Jung's theory of personality; the test has previously been demonstrated to be reliable and valid (Johnson, 2001). The MBTI includes 126 items and measures four bipolar personality dimensions: Extraverted (E) - Introverted (I), Sensing (S) - Intuitive (N), Thinking (T) - Feeling (F), and Judging (J) - Perceptive (P) (Johnson et al., 1988). The extraversion-introversion scale measures the extent to which one's energy tends to be focused outwardly to people and objects, or inwardly to experiences and ideas. The sensing-intuition dimension assesses the degree to which an individual relies on gathering information through the senses or by relying on intuition to recognize patterns and relationships. The thinking-feeling scale measures whether an individual prefers to rely on logic or personal values to make decisions. Finally, the judging-perceiving dimension assesses an individual's tendency to either be organized and in control, or flexible and spontaneous. The MBTI scores are typically interpreted by combining one's classification on each of the four bipolar dimensions to identity which of 16 different possible personality types best describes an individual's preferences (Johnson, 2001).

Employing the SDLRS and MBTI.

Perceiving there to be a lack of research examining the connection between SDL and personality, Johnson et al. (1988) investigated this relationship, using the SDLRS to measure SDL readiness and the MBTI to measure personality type. Both measures were administered to 76 upper year or graduate students who were over 26 years of age and enrolled in various social science programs at a large southeastern U.S. university. The authors hypothesized that SDLRS

scores would correlate positively with the judging style of decision making and the intuitive style of obtaining information.

The relationship between SDLRS and MBTI scores was investigated using both t-tests and chi-square tests. For all analyses, the MBTI scores were treated as categorical variables, in that participants were classified as belonging to one pole or the other on each of the four dimensions rather than being identified by a continuous score on each dimension. T-tests compared the personality types on SDLRS scores; for these analyses, SDLRS was treated as a continuous variable. Prior to performing the chi-square tests, SDLRS scores were categorized into one of three groups: below average, average, or above average. (Nearly 70% of respondents in this sample scored in the above average category.) The chi-square tests examined the association between the categorical SDLRS and MBTI variables. As predicted, the intuitive (N) type (52%) was significantly more likely than the sensing type (20%) to score above average on the SDLRS. Not surprisingly, given the previously mentioned finding, sensing types (18%) were significantly more likely to score in the below average range on the SDLRS than the intuitive type (0%). As predicted, the judging type (39%) was significantly more likely to have an above average SDLRS scores than the perceiving type (22%), and significantly less likely to have a below average SDLRS score (judging type - 6% vs. perceiving type - 19%). Chi-square and t-tests revealed no significant differences in SDLRS scores between the thinking-feeling or between the extraverted-introverted types, suggesting that these dimensions were not significantly associated with SDLRS scores. To conclude, this study suggests that intuitive types, who like ideas and tend to be future-oriented, as well as judging types, who like to be organized, are more likely to obtain high scores on SDL readiness (Johnson et al., 1988). It is important to

note that upper year and graduate students might be above average in SDL compared to the general population.

In another study involving both the SDLRS and the MBTI, Wilson (1992) examined the relationship between SDL readiness and several other variables, including locus of control, age, gender, academic program, academic status (full or part-time), employment status, marital and parental status, and most importantly, personality type. Since only the relationship between SDL and personality is relevant to the purpose of this dissertation, only the measures and results involving said variables will be discussed. The participants included in the study were 134 students from several different programs at the University of Southern Mississippi. Only adult participants were recruited; adults were defined in this study as those who were at least 23 years of age (because most people have finished college by this age, and because Guglielmino, who developed the SDLRS, defined adults by this minimum age). To qualify as adults, and thereby participants, in this study, potential participants over the age of 23 years had to have previously achieved one or more of the following criteria: parenthood, married status, and/or employment lasting throughout the entire year. The participants had an average age of 33 years, and the majority were female (77%), married (70%), parents (68%), full-time students (60%), and/or employed full-time (52%). Data were collected using the SDLRS, the MBTI, and several other measures. The order of administration of the questionnaires was counterbalanced across participants. Questionnaires were completed during class time (Wilson, 1992).

For the analyses, the MBTI scales were treated as categorical rather than continuous variables. In other words, each participant was classified on each bipolar dimension by the letter representing their preference rather than by a score on that dimension. For each of the four bipolar dimensions of the MBTI, results demonstrated a difference in the proportion of the

sample classified at each pole. For example, on the extraversion-introversion dimension, more participants were extraverted (57%) compared to introverted (43%), for the sensing-intuition dimension, more were sensing (57%) than intuitive (43%), with respect to the thinking-feeling dimension, more were feeling (54%) than thinking (46%), and in terms of the judging-perceiving dimension, more were judging (62%) than perceiving (38%). For the sample employed in this study, the average score on the SDLRS was 234. A multiple correlation analysis revealed a significant relationship between SDL and both the sensing-intuition and the thinking-feeling dimensions. Specifically, the intuitive and thinking types were associated with higher SDLRS scores. Furthermore, only these variables were significant predictors of the SDLRS scores. Sensing-intuition explained 14% of the variance in SDLRS scores, and the thinking-feeling dimension accounted for three percent of this variance. In other words, as in the previous study discussed, intuitives were found to score higher on SDL readiness. Unlike in the previous study; however, thinkers (those who prefer to make decisions using facts rather than values) in this study scored higher on SDL readiness. Although this study does not appear to have any serious limitations in terms of methodology, it is possible that the sample tested might vary from the general population in terms of its distribution of the various personality types as identified by the MBTI. Thus, as often is the case, results of this study must be interpreted with caution (Wilson, 1992).

Johnson (2001) conducted yet another study employing the SDLRS and the MBTI. Johnson examined the relationship between SDL readiness and personality type, and then used personality type to predict SDL readiness. Participants included 63 adult students, ranging in age from 21 to 57, with an average age of 39 years. All participants belonged to the same cohort in an organizational management program at a college in Florida. The majority of the participants

were female (80%), Caucasian (60%), and in their junior year of college (53%). SDL was measured using the SDLRS, and personality was assessed using the MBTI. Both instruments, as well as a demographic questionnaire, were completed by participants independently at their own convenience.

Results of correlational analyses found SDLRS scores to have a significant direct relationship with extraversion (r=0.43) and judgment (0.39), and therefore, logically, a significant indirect relationship with introversion (r=-0.39) and perceiving (r=-0.34). A multiple regression analysis was used to predict SDLRS scores using each of the eight MBTI scale scores as predictors; it revealed that, together, extraversion and judging explained approximately 25% of the variance in SDL readiness. It is mildly surprising to discover that extraversion, rather than introversion, was associated with higher SDL readiness scores, as introverts tend to turn their focus inward, to ideas. Again, as in a previously discussed study, the organized judging types were found to have higher SDL readiness scores than their perceiving type counterparts. Although the results of this study potentially provide insight into the relationship between SDL and personality, it is worth mentioning that the participants in this sample may have been higher than average on SDL readiness, as their average SDLRS score was 240.75, which corresponds to a score that is greater than one SD above the national average of 214 (SD = 25.59) for this instrument. In other words, it is possible that these findings would not generalize to the larger population (Johnson, 2001).

The three studies discussed above can be compared directly to one another more meaningfully than can some of the studies yet to be discussed. Since all of the previously outlined studies used the same instruments to measure the constructs of interest, it can at least be argued convincingly that the variables were operationally defined in a consistent way across

studies. Of course, the studies sampled from slightly different populations, so it is not especially surprising to discover that they demonstrated some variability with respect to findings. Nevertheless, it appears that the intuitive and judging types were most consistently found to be higher scoring on the SDL measure. The next study to be discussed resembles the ones previously outlined, but due to some important methodological differences, its results are not necessarily comparable.

Involving less commonly used SDL/personality measures.

A study conducted by Freed (1997), and likely comparable to those already discussed, examined whether temperament type predicts SDL readiness among older women. Although Freed used the term "temperament" instead of personality, it appears that the instrument used in this study to measure personality, discussed below, classifies participants into categories that closely resemble those of the MBTI. Therefore, it is likely reasonable to consider this study as relatively similar to the previously discussed studies that measured personality using the MBTI.

Freed (1997) hypothesized that temperament type (the intuitive preference and judging preference in particular) has an influence on SDL readiness. The volunteer sample included 390 women between 55 and 96 years of age, the majority (95%) of whom were Caucasian, from an urban area in Nebraska. Data were collected using questionnaires, including the SDLRS to measure SDL readiness. Temperament was assessed using the Adapted Kiersey Bates Temperament Sorter, a measure with 20 items that provides each participant with a score for each of four temperament preferences. These preferences include life orientation, ranging from extroverted to introverted, preferred method for gathering information, varying from sensing to intuitive, favoured means of judging or making decisions, ranging from thinking to feeling, and attitudes about the world, varying from judging to perceiving. The combination of the four scores

on the eight (four pairs) preference styles allows individuals to be classified with 16 different personality types or combinations of preferences. This instrument, like the MBTI, is based on Jung's personality model. Reliability estimates for the four dimensions ranged from r = 0.74 to r = 0.89. Age, perceived health status, education, and life events were measured using a variety of other instruments and controlled to determine how effectively temperament could predict SDL readiness beyond the mentioned covariates (Freed, 1997).

The average SDLRS score found for this sample was 225, which is similar to the mean score for adults in Canada and the U.S., according to Freed (1997). One of the 16 possible temperament types, INTP (introverted, intuitive, thinking, perceiving), was not represented in this sample. Differences were found in the proportions classified at each extreme on each of the dichotomous pairs of preferences. Specifically, extroversion was the preference exhibited over introversion by 65% of the sample, only 32% preferred intuition over sensing, 47% preferred thinking over feeling, and 88% preferred judging over perceiving. Results demonstrated that, after controlling for the potentially confounding variables, temperament type was significantly correlated with SDL readiness for the sample of older women tested. A multiple regression analysis revealed that temperament type accounted for 28% of the variance in SDLRS scores beyond the variance explained by the covariates (21%). When specific temperament types were entered into the regression equation, it was discovered that the intuitive type accounted for an additional three percent of variance in SDLRS scores, but that judging did not explain additional variance. Specifically, the intuitive type was associated with higher SDLRS scores. Thus, Freed's (1997) hypothesis was partially supported, since the intuitive type appeared to be more self-directed in the learning process, but the judging type did not. The relationships in this study were demonstrated in the previously discussed studies as well (Freed, 1997).

The next investigation to be reviewed is difficult to compare to the previously outlined studies because, although Nuckles (1997) employs the MBTI to examine personality, the researcher uses a measure not used in any of the other studies to measure SDL, called the SLAAP. For the purpose of this proposal, only the measures and results relevant to the relationship between SDL and personality will be discussed. A convenience sample of 153 (82 females and 71 males) adult learners over the age of 23 years, with an average age of approximately 34 years, were included in this study. All participants were enrolled in a bachelor's degree program in organizational management and communications at a small, private college in the Midwestern U.S. Personality data were collected using the MBTI, and SDL was measured using an instrument called The Scoring Learning As A Process (SLAAP). Nuckles predicted that both the sensing-intuition and judging-perceiving dimensions of the MBTI would be related to SDL. Specifically, it was predicted that higher intuition and higher perceiving scores would correspond to higher SDL scores.

Nuckles (1997) developed the SLAAP test for this study to assess participants' own perceptions of their SDL. The SLAAP is a self-report, self-score style instrument, and is based on the conceptualization of SDL as a process, not a personality trait. Completion of the SLAAP requires participants to reflect on the degree to which their learning process was self-directed during a previously completed learning project of their own choosing (Nuckles, 1997).

The SLAAP divides SDL into seven process components, and generates a score for each of those processes. The seven processes thought to be involved in SDL are described below. "Decision to Learn" assesses the motivation necessary to satisfy the desire to learn. "Type of Participation" refers to the decision to learn either independently or in collaboration with others. "Aims and Objectives" reflects the learner's decision to exert control over learning or allow

others to control the learning process. “Content” pertains to the learner’s decision to decide upon the content to be learned or to learn content chosen by others. “Method” relates to the decision regarding the specific learning processes to be employed. “Thought/Language” reflects the style of thinking, perceiving, and speaking to be used while learning. Finally, “Assessment” reflects the evaluation method selected to assess whether learning attempts have been successful. Each of the seven processes is scored on a seven point Likert scale. Thus, it is possible to obtain a separate score for each process. A total score on the SLAAP can be obtained by summing the scores on the seven process components, and ranges from seven to 49 (Nuckles, 1997).

Since the instrument used to measure SDL was designed for this study, a pilot study was conducted with 20 participants who had previously graduated from the same program in which the current study participants were enrolled. The pilot study was intended to determine whether participants would have the ability to complete and score the SLAAP, as well as to examine the instrument’s psychometric properties. The test appeared to have good content validity, as the items were based on an existing process model of SDL. Pilot study participants confirmed its face validity. Concurrent validity was not assessed. Test-retest reliability with a two-week interval between test administrations was high (r=.87) (Nuckles, 1997).

For the actual study, the MBTI and the SLAAP were administered during class time. Participants were asked to complete the SLAPP by applying the process items to a life-learning essay they had previously written for a course assignment. “A life-learning essay is a description of an independent learning project or activity previously engaged in by the student” (p. 41). In other words, they were asked to respond to the SLAAP items by evaluating each process component of the learning activity they discussed in their life-learning essay. Participants were asked to indicate to what extent the learning project on which they had reflected while

completing the SLAAP was representative of their typical learning behaviours by responding to a four point Likert scale question with response options ranging from very untypical to very typical (Nuckles, 1997).

For each participant, the four bipolar dimensions of the MBTI were examined independently, rather than in combination as a single personality type. Scores on the SLAAP indicated that participants perceived their learning behaviour to be very self-directed overall, as evidenced by a mean SLAAP score of 34.77. This study, unlike several other similar studies, failed to demonstrate a relationship between SDL and personality, suggesting that SDL may not be the result of a particular collection of personality characteristics. Due to the unexpected results, an attempt was made to analyze the data in another way. Specifically, rather than treating the bipolar MBTI dimensions as continuous variables, each participant's score on each of the four dimensions was converted to a categorical variable representing one or the other of the two opposite poles of the dimension. Then the opposite poles (separately for each dimension) were compared to each other in terms of SLAAP scores. There were, however, no significant differences in average total SLAAP scores between the poles for any of the four dimensions of the MBTI. This study is unique in the context of the literature review of this proposal, as it is the only one reviewed that failed to demonstrate a significant relationship between SDL and at least one personality dimension (Nuckles, 1997). One reasonable explanation for this finding might be that an instrument developed specifically for this investigation to measure SDL was used. Since the instrument was not assessed in terms of its comparability to other SDL measures, it is difficult to determine whether the instrument has criterion-related validity.

Involving SDL measures based on the personality perspective.

The final three studies to be discussed are comparable because they all conceptualize SDL as a personality characteristic rather than as a process. For this reason, they are particularly relevant to this dissertation, which approaches SDL from the personality perspective. All of the following studies used at least one personality measure based on the five-factor theory, which is convenient given the fact that the current dissertation will adopt a five factor theoretical approach to the examination of personality.

First, Lounsbury et al. (2009) conducted a study of SDL and personality with several aims. First, the researchers hoped to examine the underlying factor structure of a brief measure of SDL they had developed. Second, they wanted to generate support for the conceptualization of SDL as a personality construct, not as an instructional/process approach, by assessing the criterion-related validity of their SDL measure; specifically, they intended to examine the measure's ability to accurately and consistently predict GPA across academic levels, as it is a variable that is, arguably, a logical outcome of SDL. Third, they wanted to examine the construct validity of SDL by examining its relationship with an already well-established measure of SDL, as well as with other theoretically related constructs, including intelligence, life satisfaction, vocational interests, and mostly importantly considering the purpose of this dissertation, personality. Since this study was selected for discussion because of its examination of SDL as a personality variable, and its investigation of the relationship between SDL and personality, discussion of results will be limited, for the most part, to the correlational findings involving personality.

Three separate samples were utilized in this study. A sample of 966 middle and high school students from Tennessee, with an equal number of males and females, and an average age

of 14 years, was examined to investigate the relationship between SDL and GPA; this analysis was performed to provide support for the conceptualization of SDL as a stable personality construct capable of predicting academic performance across academic levels. Two college samples were also involved. One included 1218 college students enrolled in either a First Year Studies Program or an undergraduate psychology course at a southeastern U.S. university. Of this sample, the majority were female (61%), Caucasian (79%), and between 18 and 19 years of age (84%). The other college sample, for which demographic data were unavailable, included 4125 first-year university students involved in the Monster.com Making College Count program, which is designed to assist students in their transition to postsecondary school (Lounsbury et al., 2009).

To assess SDL, participants were administered the 10-item Resource Associates Self-Directed Learning scale; response options on this instrument range on a five-point Likert scale, and for the samples used in this study, the measure had an internal consistency value in the mid-eighties. Another, more established measure of SDL, the SDLRS, which was outlined previously, was employed in this study. To allow for an assessment of a wide array of personality traits, the authors employed several personality measures, including the MBTI, the NEO-PIR Big Five Inventory, the Resource Associates Adolescent Personal Style Inventory (APSI), and the 16 PF. Both the NEO-PIR and the APSI are based on the five-factor model, but the APSI has several additional measures, including: career-decidedness, optimism, sense of identity, tough-mindedness, and work drive. The 16PF, as the name suggests, measures 16 facets of personality, including: social warmth, reasoning, emotional resilience, dominance, liveliness, rule-consciousness, social boldness, sensitivity, vigilance, imaginativeness, self-confidence,

openness to change, self-reliance, perfectionism, tension, and impression management (Lounsbury et al., 2009).

To accomplish their first aim, which was to examine the factor structure of their SDL measure, Lounsbury et al. (2009) performed a confirmatory factor analysis using the data from the Resource Associates Self-Directed Learning scale for the sample of 4125 college students. Results demonstrated a single-factor model to be a good fit, supporting their hypothesis that the measure reflects a single underlying factor. Furthermore, all 10 test items had significant loadings on the single latent variable, suggesting that all items measure the same underlying construct (Lounsbury et al., 2009).

Lounsbury et al.'s (2009) second aim was to establish the criterion-related validity of the SDL measure. Indeed, its ability to predict an outcome associated with SDL (GPA) was indeed supported by the significant positive correlation between SDL and GPA found for students at all levels examined in this study; although GPA is not a variable of interest in the current dissertation, the consistent relationship between SDL and GPA supports the contention that SDL has the stability of a personality trait (Lounsbury et al., 2009).

The third aim of this study was to establish the construct validity of the personality characteristic of SDL. Evidence for construct validity was provided by the correlations found between SDL and several of the personality measures. First, SDL did not correlate significantly with the MBTI scales, except for the Intuitive measure, with which it had a significant weak to moderate ($r = 0.3$) correlation. SDL correlated significantly with openness, as measured by the 16PF ($r = 0.44$), the NEO-PIR ($r = 0.30$), and the APSI ($r = 0.54$), and with conscientiousness on the NEO-PI-R ($r = 0.33$) and the APSI ($r = 0.29$). It had a significant inverse relationship with neuroticism on the NEO-PI-R ($r = -0.27$) and anxiety on the 16PF ($r = -0.4$), and a significant

positive relationship with emotional stability on the APSI (r = 0.28), as would be expected given its inverse relationship with neuroticism. SDL had significant direct relationships with the Career-Decidedness (r = 0.24), Optimism (r = 0.38), Extraversion (r = 0.16), Agreeableness (r = 0.28), Sense of Identity (r = 0.39), and Work Drive (r = 0.49) scales of the APSI. The Resource Associates Self-Directed Learning scale scores had a significant positive correlation with scores on the SDLRS (r = 0.82), which was the more established SDL measure used in this study; this finding suggests that the two SDL tests measure the same underlying construct, which provides further support for the construct validity of the Resource Associates Self-Directed Learning scale (Lounsbury et al., 2009).

In summary, the Lounsbury et al. (2009) study provided evidence for the conceptualization of SDL as a unitary construct, although such a finding does not necessarily imply that the underlying construct measured is actually SDL. Furthermore, the investigation demonstrated the criterion-related validity of their SDL measure through its ability to predict GPA effectively, which supported the view of SDL as a stable personality dimension. Construct validity for SDL was demonstrated by its relationships with other logically related constructs in this study, particularly personality. SDL appeared to be directly related to openness and conscientiousness, and indirectly with neuroticism, and these relationships were demonstrated in the correlations between SDL and personality as measured by multiple instruments. These findings are not surprising, as one would expect self-directed learners to be open to change, diversity, and novelty, and also achievement-oriented. As well, they might be less likely to be depressed and anxious than those who are less self-directed. Interestingly, SDL had moderate positive relationships with Career-Decidedness, Optimism, Sense of Identity, and Work Drive.

As demonstrated in previous studies discussed, the intuitive dimension of the MBTI was related to SDL in this study as well (Lounsbury et al., 2009).

Next, a study by Kirwan, Lounsbury, & Gibson (2010) examined the relationship between personality and learner self-direction. The term "learner self-direction" was borrowed from Brockett and Hiemstra's self-direction in learning model, and represents the personality component of self-direction in learning, as contrasted with the self-directed learning component, which refers to the process component of self-direction in learning. Learner self-direction, the construct of interest in this study, refers to a learner's preference for taking responsibility for all aspects of his learning process. This study investigated three specific hypotheses. First, it aimed to determine how much variance in learner self-direction could be explained by the big five personality traits. Next, it investigated whether learner self-direction would correlate with any of the narrow personality traits, such as sense of identity, optimism, tough-mindedness, and work drive. Finally, it examined whether the narrow traits explain a significant amount of variance in learner self-direction beyond that which is explained by the big five traits.

The study involved a volunteer sample of 2102 students registered in an introductory psychology class and a First-Year Studies program at a university in the southeastern U.S. Sixty-eight percent of the sample was female, 79% were first-year students, and 81% were between 18 and 19 years of age. Personality and learner self-direction were both assessed via an online inventory called the Resource Associates' Transition to College inventory (RATTC). This instrument is intended for adolescents and adults in high school or college, and measures normal personality by assessing the big five (openness, conscientiousness, extraversion, agreeableness, neuroticism) and narrow (sense of identity, optimism, tough-mindedness, work drive) traits, as

well as learner self-direction, which is measured on a 10-item, Likert style subscale. The RATTC appears to have good internal consistency and construct validity (Kirwan et al., 2010).

Each of the big five traits, with the exception of extraversion, had a significant association with learner self-direction. Openness had the strongest relationship (r = 0.43), followed by agreeableness (r = 0.21), and finally, neuroticism (r = -0.20) and conscientiousness (r = 0.2). The relationship between neuroticism and learner self-direction was inverse, suggesting that emotional stability (at the opposite end of the spectrum from neuroticism) was associated with learner self-direction. All of the narrow traits had significant relationships with learner self-direction as well. Work drive had the strongest correlation (r = 0.49) followed by Optimism (r = 0.31), and then Sense of identity (r = 0.30). Tough-mindedness had the weakest relationship (r = -0.07), which was significant only at the .05 level, while all of the other relationships were significant at the .01 level (Kirwan et al., 2010).

To determine the degree of variance in learner self-direction accounted for by the big five traits, and whether the narrow traits accounted for additional variance, a step-wise regression was conducted, sex, age, and school year were used as control variables, and were therefore entered into the analysis in the first step. Next, the big five traits were added to the analysis in stepwise fashion, and together they explained 37% percent of the variance in learner self-direction (Kirwan et al., 2010).

To determine whether the narrow traits contributed additional variance beyond the big five traits, Kirwan et al. (2010) employed another stepwise regression, with the set of demographic variables entered in the first step, the set of big five traits entered during the second step, and the narrow traits entered in the last step. Optimism explained 14% more variance beyond what the previously entered variables accounted for, and work drive contributed an

additional 1.5%, but sense of identity and tough-mindedness failed to explain a significant amount of variance beyond what was explained by the variables already discussed (Kirwan et al., 2010).

In another stepwise regression, with demographic variables entered in the first step, and the personality traits, both big five and narrow, entered in the next step, optimism contributed 44% of variance, work drive contributed 3%, and conscientiousness explained 1.4%. Emotional stability and tough-mindedness explained less than 1% of variance each. To conclude, the personality traits together explained more than half of the variance in learner self-direction. Essentially, the results of this study support the conceptualization of learner self-direction as a personality trait. Kirwan et al.'s (2010) findings suggest that all of the big five traits, except extroversion, might be moderately associated with learner self-direction, as well as many of the narrow traits (Work Drive, Optimism, and Sense of Identity). Interestingly, based on the results of both regression analyses, optimism appeared to explain the most variance in self-direction in learning (Kirwan et al., 2010).

Cazan and Schiopca (2014), who examined SDL from the personality rather than the process perspective, attempted to investigate the relationship between SDL, personality, and academic achievement. For the purpose of this dissertation, only the results relevant to the association between SDL and personality will be discussed. Participants included 121 first and third year undergraduate students at a Romanian university. SDL was assessed using a translated version of the 60-item Self-Rating Scale of Self-Directed Learning (SRSSDL), which was demonstrated to have reasonable internal consistency. As the name suggests, the instrument measures self-reported degree of self-direction in learning. Sets of 12 items, all measured on a five-point Likert scale, examine five dimensions of SDL. First, awareness assesses understanding

of variables that promote SDL. Next, learning strategies involved in SDL are examined. Learning activities necessary to be self-directed in one's learning are investigated as well. Furthermore, evaluation is measured, and refers to learner characteristics required for self-monitoring during the learning process. Finally, interpersonal skills of the learner are assessed. The big five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) were assessed using the International Personality Item Pool (IPIP-50), a tool with 50 five-point Likert scale items that was constructed as a public instrument for measuring personality differences.

Results demonstrated significant, weak to moderate, positive correlations between openness and all dimensions of SDL except awareness. On the other hand, conscientiousness demonstrated a significant positive, albeit weak, relationship only with the awareness dimension. Extraversion had a significant moderate positive relationship with both learning strategies and interpersonal skills; agreeableness showed a moderate positive relationship with interpersonal skills. Emotional stability was not significantly correlated with any SDL dimensions. Of the big five traits, openness was most closely related to SDL, as it correlated with more SDL dimensions than any other trait. It was found to be the only significant predictor of SDL. All of the big five traits, except emotional stability/neuroticism, were related to SDL. Although numerous significant correlations were revealed between personality traits and SDL dimensions, personality traits accounted for merely 10% of the total variability in SDL scores. This study, although it approached SDL from a personality perspective, like the two previous studies, used different instruments to measure both SDL and personality than any other study. Thus, once again, the results are difficult to compare to those from the other studies outlined. However, this

study demonstrated that various aspects of SDL correlated with different personality traits (Cazan & Schiopca, 2014).

Based on the three studies that examined SDL as a personality construct, the majority of the evidence supported the existence of a positive relationship between SDL and the openness, conscientiousness, and agreeableness personality traits. Evidence suggests that SDL might be positively related to work drive, optimism, and sense of identity.

Although numerous studies have been conducted on the relationship between personality and SDL, it is difficult to confidently make conclusions about the relationship; many relevant differences exist among the studies that were discussed. First, SDL was conceptualized differently in the different studies, as it was sometimes considered as a process, and at other times recognized as a personality component. This inconsistency with respect to how SDL was defined and understood led to another important difference between studies, which was the instrument used to measure SDL. Furthermore, the other construct of interest, personality, was measured using a variety of tests, many of which assessed different traits or dimensions of personality. The tests were based on different theoretical approaches to personality. Thus, it is not entirely surprising that different studies generated some contradictory results.

The studies that conceptualized SDL as a personality construct are of particular relevance to this dissertation, as they provide evidence that can most appropriately be used to formulate hypotheses for the current study. That being said, the studies that examined, and therefore measured, SDL as a process might nevertheless provide important evidence of the relationship between SDL and personality, as those who obtained high scores on process measures of SDL might have obtained high scores on personality oriented SDL measures as well. In other words, there might be considerable overlap between personality and process measures of SDL.

Although the variability in the results demonstrated from the studies discussed makes it difficult to understand the relationships between personality and SDL, it is likely reasonable to assume that SDL somehow relates to at least some dimensions of personality. Of course, if a relationship can be assumed to exist between some aspect(s) of personality and SDL, it is important to consider the direction of this relationship. In other words, does personality contribute to learner self-direction, does learner self-direction lead to the development of particular personality traits, or do the two constructs share a reciprocal relationship?

Chapter Conclusion

This chapter sought to establish a suitable theoretical approach to both constructs of interest: SDL and personality. With respect to SDL, it seemed appropriate to adopt a personality approach to SDL rather than a process approach, as the purpose of this dissertation is to reveal the relationship between SDL and personality. Although personality views of SDL currently exist, it is difficult to determine their appropriateness. This study will, ideally, contribute to our understanding of SDL as a personality construct, and reveal which existing personality approach, if any, provides an accurate description of SDL as a personality construct. In terms of personality, five-factor theory was argued to be the best approach because it is supported by empirical evidence and because, due to its breadth, it accounts for the phenomena explained by other narrower theories. Although Jung's theory led to a popular personality measure, as did five-factor theory, Jung's approach leads to potential problems when it comes to interpreting individual differences, as it categorizes individuals into groups rather than assigning scores, thereby ignoring variability within groups. Finally, although a considerable amount of research has been conducted with the purpose of revealing the relationship between SDL and personality, it is difficult to make any definitive conclusions, as different studies used a variety of different

measures for both SDL and personality. Furthermore, most of the existing research appears to have used measures that are inappropriate given the theoretical approaches to SDL and personality adopted for this dissertation.

Chapter Summary

At this point, the theoretical approach to both SDL and personality has been discussed and justified, and competing theoretical approaches have been reviewed in terms of both their strengths and limitations. Furthermore, existing research with purposes similar to that of this dissertation has been outlined, and it has been established that the question regarding the relationship between SDL and personality remains to be effectively answered. Thus, further research is necessary to address this issue. On that note, the next chapter will outline the research method to be used to address the purpose of this dissertation.

Chapter 3: Research Methods

Although self-directed learning (SDL) has been defined in a variety of ways, it has typically been approached from either a process or personality perspective (Oddi, 1987). Most often, SDL has been considered "a method of study" (Caffarella & O'Donnell, 1987, p. 199), and the focus has been "on the activities of planning, implementing, and evaluating learning" (Brockett & Hiemstra, 1991, p. 28). Other theorists, however, describe SDL as a personality construct (Lounsbury et al., 2009), and this approach has encouraged some researchers to examine personality characteristics related to SDL. As mentioned previously, the purpose of this dissertation will be to adopt the personality view and identify personality characteristics associated with, and possibly predictive of, SDL.

This chapter will discuss and provide a justification for the dissertation methodology. First, the research method and its appropriateness for the dissertation goal will be discussed. Next, a rationale will be provided for selecting the statistical analyses to be used, and a brief discussion of their benefits and shortcomings will be included. Then, an overview of and rationale for the sampling method and the participants to be included will be provided. Ethical concerns will be addressed. Next, data collection procedures will be outlined. Specifically, the strengths and weaknesses of self-report measures will be discussed generally. Then, specific measures considered for use will be discussed. First, two measures of SDL, as well as research outlining their strengths and weaknesses, will be presented. Although numerous tests of SDL have been developed, it is impractical to attempt to discuss them all here. Thus, only the Self-Directed Learning Readiness Scale (SDLRS) and the Oddi Continuing Learning Inventory (OCLI) will be examined. These tests were selected for examination because they are the most commonly used measures of SDL (Merriam, Caffarella, & Baumgartner, 2007), and because

they reflect the process and personality approaches to SDL, respectively. A brief argument will be provided for selecting one measure over the other. Then, two popular measures of personality will be described and evaluated, and a rationale will be suggested for choosing one of them instead of the other. A demographic questionnaire to be used will be outlined briefly.

Research Method and Design Appropriateness

Before describing and discussing the rationale for the specific research design to be used for this project, it is important to first provide a rationale for the more general approach to be taken, which is the quantitative method. From both an ontological perspective, with respect to the nature of the relationship between the researcher and the subject matter being researched, and an epistemological perspective, or the nature of the knowledge itself, a quantitative approach seems most appropriate. While a qualitative approach assumes that the researcher and the subject matter being researched share a reciprocal relationship, and that the content is constructed by the researcher and is open to interpretation, the quantitative approach assumes that the researcher is separate from the content to be researched, and that an objective reality exists and can be known, to a greater or lesser extent, by the researcher (Sale, Lohfeld, & Brazil, 2002). Although this researcher acknowledges that, in many cases, an investigator can influence the subject matter being examined, and that empirical investigation may be imperfect, as instruments may include measurement error in their assessment of a phenomenon, this researcher nevertheless assumes that an objective reality does exist and can be known at least to some extent. Furthermore, this researcher is not alone in this worldview, as positivism, upon which quantitative methods are based, is the dominant paradigm of the social sciences (Sale et al., 2002). This positivistic paradigm is evident in the measures designed to measure SDL and personality, the most common of which are based on a quantitative approach. That is not to say that qualitative approaches are

entirely inappropriate for the study of social science topics, but these approaches are based on an entirely different understanding of the phenomena to be examined. Would it then be appropriate to combine quantitative and qualitative methods to provide a more comprehensive understanding of the constructs of interest? Although from a methodological standpoint, it is possible to combine quantitative and qualitative approaches, it may be inappropriate to do so from a philosophical standpoint, as these approaches are based on mutually exclusive worldviews (Sale et al., 2002). From a more practical perspective, the question of interest in this dissertation relates to the relationship between SDL and personality. The most objective way to answer this question is to provide a numerical index of the strength this relationship. Conveniently, the existing instruments used to measure both constructs of interest, SDL and personality, provide numerical data, which will allow for a quantitative assessment of the relationship between SDL and personality. Furthermore, to make use of these tests, a quantitative approach is arguably necessary. A benefit to using existing quantitative tests is that the results of this dissertation can be easily compared to the results of other studies that used the same instruments.

Now that a rationale has been provided for the broad approach to this study, a description and rationale for the specific research design will be provided. As mentioned before, the goal of this dissertation is to examine a relationship between two constructs: SDL and personality. Furthermore, it has been established that a quantitative approach will be used in this investigation. Therefore, the logical approach to this examination is a correlational design, which requires two quantitative variables to be measured for each participant so that the nature of the relationship between them can be examined. These variables will be assessed using instruments that will be described and evaluated later on in the chapter. Next, it is important to discuss and

justify the data analysis techniques to be used, as they follow logically from the research design selected.

Analyses

It has been mentioned already that both constructs of interest in this study are commonly measured using instruments that provide quantitative data. Specifically, more often than not, these instruments produce scores that classify these variables on an interval scale of measurement. Given that the relationship between two variables, both measured on an interval scale of measurement, is the focus of the study, the necessary statistical analyses to be conducted include correlation analyses, to examine the relationship between SDL and personality, as well as regression analyses, to predict SDL using personality dimensions as predictors. Although these analyses are, essentially, the only logical options given the purpose of this dissertation, further support for selecting these analyses comes from the fact that previous research conducted to examine the association between SDL and personality (both measured using a variety of tests) has generally used correlation and regression as well. For example, examining samples of college/university students, numerous researchers have used correlations to examine relationships between scale scores on the Myers-Briggs Type Indicator (MBTI), a self-report personality measure, and scores on the SDLRS (Johnson, 2001; Johnson et al., 1988; Wilson, 1992).

Furthermore, several studies have used regression to determine the percentage of variance in SDLRS scores that could be explained by variability in MBTI scale scores (Johnson, 2001; Wilson, 1992). Kirwan et al. (2010) used a multiple regression to predict college students' scores on the learner self-direction subscale of the Resources Associates Transition to College (RATTC) inventory using the Big Five personality traits, also measured using the RATTC, as

predictors. Finally, Cazan and Schiopca (2014) used correlation and multiple regression to assess the relationship between learner self-direction and the Big Five personality traits, as measured by the Self-Rating Scale of Self-Directed Learning (SRSSDL) and the International Personality Item Pool (IPIP), respectively, among a sample of Romanian university students. Since the above-mentioned studies are but a few of the many that have examined the relationship between personality and SDL using correlation/regression, it is fair to say that these analysis techniques are widely accepted for this purpose. In fact, the majority of research studies in SDL have been correlational (Brockett, Stockdale, Fogerson, Dewey, Cox, Canipe, Chuprina, Donaghy, & Chadwell, 2000).

Although correlation is a popular and useful technique, it has some limitations/weaknesses. For example, the accuracy of a correlation can be compromised when one of the variables involved has a restricted, or truncated, range (Huck, 1992; Tran, 2011). A restricted range is particularly likely to occur when a study sample is fairly homogenous, as scores on one or both of the variables will have low variability. When either variable has low variability, the resulting correlation coefficient can be underestimated.

On the other hand, heterogeneity of a population can affect the size of a correlation as well (Huck, 1992). A correlation obtained for a sample may accurately describe the relationship between the variables of interest for only a particular subset of the population, and it should not be surprising to discover different degrees of correlation between a pair of variables for different samples within the population (Medinnus, 1962).

Although population variability can interfere with their accuracy, correlations are nevertheless remarkably robust. Empirical research by Havlicek and Peterson (1976) has demonstrated that the Pearson correlation coefficient is only minimally affected by the failure to

meet assumptions often considered necessary to satisfy to use the test appropriately, including, for both variables, the assumption of a normal distribution and an interval/ratio scale of measurement.

Although it is commonly used, multiple regression is not always appropriate. For example, in the case of multicollinearity, which involves a strong correlation between any two predictor variables, a multiple regression analysis may generate ambiguous results. Multicollinearity between two predictors indicates that they are redundant, and both are not required in the analysis. When two redundant predictors are included, they explain overlapping variance, and the interpretation of the solution becomes awkward because determining which predictor is significant and how much variance each predictor accounts for becomes difficult (Morrow-Howell, 1994). Results of multiple regression analysis are sensitive to violations of homoscedasticity. Homoscedasticity means a consistent degree of error is associated with prediction regardless of the value of the predictor. When this assumption is violated (heteroscedasticity), the error associated with prediction varies depending on the score a participant obtains on the predictor variable (Osborne & Waters, 2002), so it can be difficult to determine the accuracy of the predictions. Nevertheless, multiple regression can be a useful tool as long as its limitations are taken into consideration.

Participants

The population of interest for this study includes current students in their first year of any program from a Northeastern Ontario college and university campus. In other words, all first-year students, regardless of program, were invited to participate. This approach encourages as large a sample as possible, and allows for an examination of differences between participants

from different programs, should discrepancies exist. A minimum of 140 students are required; a power analysis, to be discussed later in this section, provides the justification for this number.

First, it is important to justify the selection of first year college and university students for this investigation more generally. It is reasonable to assume that, for many, the first year of postsecondary study provides the first opportunity for independent learning, relatively speaking, as students may have more freedom than ever before to choose what they will learn and how they will learn it. Considering that some type of postsecondary school is considered essential nowadays, and therefore a larger number and variety of individuals are attending postsecondary school than in previous generations (Shaienks, Gluszynski, & Bayard, 2008), considerable variability is likely among first year students in terms of their SDL propensity, which has the potential to generate interesting findings. Another reason for selecting this population for study is that previous research examining the SDL-personality connection has studied this population (Cazan & Schiopca, 2014; Kirwan et al., 2010; Lounsbury et al., 2009). Thus, the current study attempted to replicate previous findings that supported a connection between these constructs within this population.

Next, it is important to justify the selection of the particular postsecondary institutions from which the sample will be recruited. The campus, located in Northeastern Ontario, is shared by the university and the college, and therefore provides a fairly unique opportunity to examine personality, SDL, and their relationship among postsecondary students who attend different institutions and/or are enrolled in different programs, yet live and learn in the same community. Thus, this campus allows for an examination of any differences between college and university students in terms of SDL, personality, and the relationship between them; however, it eliminates

the possibility that certain potential confounding variables related to location might influence the relationship between the variables of interest.

Finally, because students from a variety of programs were encouraged to participate, any differences between programs can be revealed. Previous research has demonstrated significant differences on each of the Big Five personality characteristics between students from different academic programs (Vedel, Thomsen, & Larsen, 2015). In a similar fashion, it is quite possible that students from different majors will differ on SDL, as it can be understood as a personality construct, and as mentioned above, personality might be related to academic program. Furthermore, the nature of a relationship between two variables, SDL and personality in this case, may vary across sections of the same population, so examining different subsets of a population allows for a better understanding of how well a relationship found for one subset of a population generalizes to different groups in the same population. Thus, although past research has found personality to be associated with SDL (Johnson, Sample, & Jones, 1988), the nature of this relationship may vary across groups. Comparing college and university students from various programs helps to reveal the degree of consistency of the relationship between SDL and personality across groups.

In terms of sample size required, a power analysis was conducted to provide a goal for minimum number of subjects to include. Since correlational analyses will be the primary statistical analysis to be used, a power analysis for a Pearson r correlation was performed. First, several values must be estimated or decided upon. For example, anticipated correlation values should be quantified. Although this is difficult to predict, based on previous research on the relationship between various personality and SDL dimensions, correlation coefficient values above $r = .40$ appear to be rare, so that value will be used in the calculation. Desired alpha level,

which identifies risk of type 1 error, and desired power level, which quantifies the likelihood of correctly rejecting the null hypothesis, must be specified. Since an alpha of .05 is commonly used, this value seems appropriate for the current investigation; it is large enough to identify a correlation if it is reasonably large, but small enough to minimize the risk of concluding that a chance correlation reflects a real relationship in the population. A power value of .8, which is commonly selected, is reasonable, as it provides a high likelihood of correctly rejecting the null hypothesis when a relationship between the variables exists. Having established the necessary values for computing a power analysis, the computation can be completed. Results of said analysis suggest a minimum sample size of approximately 140 participants. Thus, ideally, a large volunteer sample of at least 140 participants is required. The power analysis, however, is overly simplistic. To examine relationships within subsets of the sample (within different programs, for example), it is desirable to have a much larger sample. Thus, as many students as are willing to participate were included. Limitations due to small sample size, if applicable, are taken into consideration while performing statistical analyses. It is important to consider, more generally, that when using volunteer samples, important differences between those who choose to participate and those who do not may exist, so the findings based on these samples may not generalize to the larger population (Cuddeback, Wilson, Orme, & Combs-Orme, 2004).

Procedure

Recruitment occurred via email. An email inviting students to participate in this study was composed by the principle investigator and provided to the registrars of the university and college. From there, it was sent to the email addresses of all first-year students. The emailed invite was sent to potential participants at the university in early October of 2017, and at the college in early October of 2018, when students had already adjusted to their Fall schedules, but

had not yet reached the point in the semester when they had to write midterm exams. The email included an Information letter detailing the purpose of the study. It reminded the students that participation was voluntary, that they could withdraw from the study at any time without penalty, and that data collected would remain confidential, as they would only be identified by a code on the instruments they completed. Additionally, participants were informed of any potential risks and benefits of the study.

A unique code was provided in each email so that students could be emailed their results upon completion of the study. This was done to provide an incentive for participation, as well as a personal benefit to them, as it allowed them to learn something about themselves. Another incentive for participants was to have their name entered into a draw for a chance to win one of 10 20-dollar value Tim Horton's gift cards. Risks associated with this study were minimal. The study took up some of their time, for one thing, but likely fewer than 30 minutes. In some cases, students might have experienced psychological distress if they perceived their results to be undesirable in some way. The researcher, however, provided contact information for student support services, as well as her own contact information in case students wished for results to be explained in detail.

To encourage participation, a reminder, two weeks after the initial recruitment email, was sent out to those who failed to complete the study. This email was sent around the middle to the end of October. Those who agreed to participate were asked to complete a demographic questionnaire, a measure of personality, and a measure of SDL. These instruments are discussed in more detail later in this chapter. Instruments were completed online; a link to these questionnaires was included in the body of the recruitment email. Specifically, the questions from all three instruments (demographic questionnaire, SDL measure, and personality measure)

were combined in one survey, which was developed using Hosted in Canada Surveys. This survey platform was selected because it allows for the use of a variety of question types, permitting the creation of a single questionnaire to collect all data. Furthermore, it allows data to be exported easily into SPSS (a software package used for statistical analysis), which allows for more efficient data management ("Hosted in Canada Surveys", 2017). Now that population, sampling, and procedural issues have been discussed, specific data collection instruments will be described and evaluated in detail.

Measures

Before discussing the specific instruments that were employed, it is important to mention that all measures selected for this study are self-reports. Self-reports are the most common, and likely the most widely accepted, method for collecting social science data (Schwarz, 1999). Nevertheless, they have certain inherent limitations. For example, although it is well known that the validity of self-reported personality data may be compromised, as people may lack self-awareness or attempt to present an inaccurate image of themselves, research suggests that self-reports may be less reliable than other data collection methods, such as informant-reports (Balsis, Cooper, & Oltmanns, 2015). Unfortunately, research findings suggest that methods like guaranteeing anonymity do not necessarily increase participants' honesty (Lelkes, Krosnick, Marx, Judd, & Park, 2012). It is fair to assume, then, that guaranteeing confidentiality, as will be done in this study, will not promote honest responses from participants either. Furthermore, it is important to appreciate that the nature of questions on a questionnaire has a considerable impact on the types of responses obtained; although researchers use questionnaires to gather information from participants, participants gather information about the purpose of the questionnaire and about what type of response is expected of them based on the nature of the questions themselves

(Schwarz, 1999). Thus, it is important to consider the effect of question wording and other factors on participant responses. Nevertheless, although self-report measures of personality may be flawed in various ways, they deliver a unique perspective on personality (Oishi & Roth, 2009), and are therefore an important source of useful information.

Demographic questionnaire.

This instrument was used to gather information on sex, age, marital status, institution (university or college), program, year in program, length of program, enrollment status, educational background (whether they have previously completed any postsecondary study), living arrangements (with parents, roommates, etc.), whether their parents attended postsecondary school, whether they work and hours worked per week, how they are paying for school (parents, scholarships, earnings), and their approximate academic grade average). Data on these variables allow for an analysis of relationships between SDL and various potentially relevant demographic variables. Research using students of various ages has previously demonstrated significant age by gender interactions, suggesting that SDL increases with age, particularly among females (Reio & Davis, 2005). Thus, it is important to further examine the relevance of demographic characteristics to SDL for this population.

SDL measures.

As mentioned previously two of the most commonly used measures of SDL, the SDLRS, and the OCLI, are discussed in terms of their development and psychometric evaluation. This section provides sufficient information to allow for an informed decision regarding the ideal instrument to use for the purpose of this dissertation.

Self-directed learning readiness scale. The first measure to be discussed is likely the most commonly used in the literature to measure SDL (Straka & Hinz, 1996), and is called the Self-Directed Learning Readiness Scale (SDLRS). It is a self-report style questionnaire, which, when initially developed, included 41 Likert scale items, before later revisions, which produced an instrument with 58 items that is used today (Hoban, Lawson, Mazmanian, Best, & Seibel, 2005). The SDLRS was based on a process view of SDL (Oddi, 1987), but assesses some personality factors as well (Merriam et al., 2007).

Development. Guglielmino (1977) created the SDLRS as part of a study aimed at defining and producing a measurement tool for SDL readiness. This study involved two steps. First, a panel of SDL experts were surveyed using the Delphi technique to determine the nature of SDL. Next, based on the results of the Delphi procedure, the SDLRS was created.

The Delphi technique is "a tool for obtaining the most reliable opinion consensus of a group of experts where exact knowledge is unavailable" (Guglielmino, 1977, p. 21). It is useful for producing an agreed upon definition for any construct for which there is no inherently correct definition, such as SDL (Guglielmino, 1977).

For the first step in this study, 14 authorities in SDL were recruited and asked to respond anonymously to three questionnaires. The first questionnaire asked them to produce a list of personal characteristics considered relevant to SDL. The second combined the responses from all participants to the first questionnaire and asked each expert to assess the relevance of each item and add any others if necessary. The third provided group statistics for each response and asked experts to rank each item according to its relevance to SDL. Based on the experts' average ratings, 33 characteristics were selected as representative of SDL (Guglielmino, 1977).

For the second step in the study, the results of the Delphi survey were used to select items to include on the SDLRS. The completed scale was administered to a homogenous cluster sample of 307 adolescent and adult students in the U.S. and Canada. Cronbach's alpha for this sample was .87, indicating homogeneity of the scale. A factor analysis revealed eight factors, including "openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, future orientation, and ability to use basic study skills and problem-solving skills" (p. ii-iii). Unfortunately, numerous items were later revised due to their difficulty level or low correlation with the total test score, so the scale's internal consistency and factor solution may have been affected (Guglielmino, 1977).

Guglielmino recognized several potential problems with her scale, including a factor consisting of negatively worded items, suggesting that participants were responding to item wording, not content. Another issue was the unrepresentative sample used to test the scale, which limited the generalizability of the findings (Guglielmino, 1977).

Psychometric properties. Other researchers have presented criticisms of the SDLRS, in terms of its reliability and validity, factor structure, as well as its appropriateness for particular populations. Specifically, both Field (1989) and Brockett (1985) revealed potential problems with the scale, which should be taken into consideration by anyone using the scale for research or any other purpose.

In his 1989 study, Field expressed several concerns about Guglielmino's SDLRS. Most importantly, he questioned its reliability and validity, arguing that most researchers who used it did not independently assess its psychometric properties, but instead relied on Guglielmino's claims about the scale's quality. He argued that the properties reported for the scale pertained to

the original version, before revisions were made, so reliability, validity, and factor structure of the revised version were unknown (Field, 1989).

As well, Field (1989) suspected that Guglielmino had performed an inappropriate statistical analysis, and thereby incorrectly identified factors underlying her scale. Thus, using SDLRS data from over 200 Australian students, Field conducted a factor analysis, which revealed four underlying dimensions, including "[l]ove of and/or enthusiasm for learning", "[i]nitiative and independence in learning", "[f]acility with negatively phrased items", and "[a]cceptance of responsibility for one's own learning" (Field, 1989, p. 133). Only the first factor explained a substantial proportion of total variance, however. The third was composed of only negatively worded items, the fourth was not reliable, and many scale items did not load on any factor. According to Field's results, the SDLRS may not measure a complex eight-factor construct, as Guglielmino's results indicated. Instead, Field identified only four questionable factors. Other research has demonstrated the factor structure of the SDLRS to be unstable (Straka & Hinz, 1996).

Since his analysis did not reveal SDL to be the multifaceted construct Guglielmino suggested it to be, Field (1989) explored the possibility that SDL might instead represent a unitary construct by calculating internal consistency for the SDLRS. The Cronbach's alpha value of .89 confirmed that the scale measured a unitary construct, not several separate dimensions. Field further examined reliability of the scale by correlating scores on each item with the total scale score. Generally, the negatively worded items did not correlate significantly with the total score, suggesting that wording was a confounding factor. Oddly, the items with the highest face validity had low correlations with the total score, suggesting that the scale may measure

something other than SDL. Bonham (1991) suggested that the SDLRS likely measures enjoyment of learning generally, not SDL specifically.

Brockett (1985) discovered some problems with the SDLRS when he used it to examine the association between SDL readiness and life satisfaction among older adults. In his research, he administered both the SDLRS and a measure of life satisfaction to a random sample of 96 participants who were at least 60 years old. Although it was not his intention to assess the quality of the SDLRS, he noticed some problems with its use, which led him to examine it in more detail in his study. Specifically, he noted that participant responses were often incomplete or inconsistent. Numerous participants failed to complete the instrument because they reported items and/or response options to be confusing or not applicable to them. Interestingly, these participants did not experience similar difficulties with the life satisfaction measure, which led Brockett to suspect that the SDLRS was the problem. Brockett's sample included participants with lower levels of formal education compared to samples tested with the SDLRS in other studies.

Furthermore, although Brockett's (1985) sample data revealed a Cronbach's alpha of .87, indicating high internal consistency, an item analysis revealed 12 items (mostly negatively worded) that did not correlate significantly with the total score and that were especially challenging for his sample. Several of the questions emphasized school learning specifically, which leads to concerns about content validity. Brockett argued, based on his findings, that the SDLRS may not be appropriate for those without much formal education.

To conclude, contrary to Guglielmino's findings, Field's (1989) evidence suggests that the SDLRS reflects a unitary rather than a multifaceted construct. Field argued that the scale may measure enjoyment of learning generally, not desire for SDL specifically. Finally, Brockett

(1985) demonstrated that the test may be better suited for learners with more formal schooling experience, since it assesses familiarity with school learning more than interest in SDL. More recent evidence from a factor analysis conducted on the SDLRS scores (based on the revised version with 58 items) of 972 medical students at a university in Virginia, the instrument did not effectively measure the dimensions determined to be characteristic of SDL, according to Guglielmino. Thus, the definition and theoretical foundation upon which the SDLRS is based, may benefit from revisions (Hoban et al., 2005).

Oddi continuing learning inventory. Another popular tool for assessing SDL, but from a personality perspective, is the OCLI, a self-report questionnaire consisting of 24 Likert scale items (Merriam et al., 2007). Oddi (1984), the creator of this instrument, introduced the term self-directed continuing learning (SDCL) to distinguish her personality perspective of SDL from the more popular learning process perspective found in the existing literature. In hopes of identifying personality factors related to and/or responsible for SDL, she conducted a study to define SDCL, to develop a tool to measure it, and to empirically examine the psychometric properties of the instrument (Oddi, 1984).

Development. Upon examination of the literature surrounding SDL, Oddi (1984) developed a theory that identified three underlying components of SDCL: drive, degree of cognitive openness, and learning commitment. From this theory, she created the OCLI. Specifically, these components were used to generate a total of 100 potential scale items, which were assessed for content validity and classified according to the dimension they appeared to measure by SDL experts and graduate students. According to the results of a pilot study, which used data from a sample of graduate students, the scale reflected the three underlying dimensions of SDCL (Oddi, 1984).

The final 24-item OCLI was tested for reliability and validity using a sample of 271 graduate students. Each participant completed the OCLI and one other scale (randomly chosen from four possibilities to be discussed later) to allow for assessment of the OCLI's construct validity. Results from this sample demonstrated good reliability; Cronbach's alpha was .88 and test-retest reliability was .89. A factor analysis revealed three factors, which together explained 46 percent of the total variance. Factor one (consisting of 15 items) explained 31 percent of total variance, and appeared to reflect "ability to work independently and learning through involvement with others" (Oddi, 1984, p. 134); it did not seem to represent a specific theoretical dimension of SDCL. Factor two (three items) explained eight percent of variance, and appeared to measure "ability to be self-regulating" (Oddi, 1984, p. 137); it best reflected the drive dimension of SDCL. The third factor (four items) accounted for almost seven percent of variance, and was called "[r]eading [a]vidity" (Oddi, 1984, p. 138); it seemed to reflect the learning commitment dimension of SDCL (Oddi, 1984).

Construct validity of the OCLI (both discriminant and convergent) was assessed by correlating OCLI scores of the graduate student sample with their scores on four other instruments. Three measures, which were theoretically associated with SDCL, were used to assess convergent validity. They included the Leisure Activity Survey (LAS) to assess adults' degree of involvement in educational pursuits, the Internal-External Scale (I-E Scale), which assesses locus of control, and indirectly, willingness to assume responsibility for life outcomes, and the Adjective Checklist (ACL) to measure personality characteristics using four subscales. Since self-directed continuing learners (SDCLs) would be expected to engage in educational activities, to have an internal locus of control, and to have specific personality traits, scores on the measures that assess these variables were expected to correlate with OCLI scores. The fourth

scale, the Shipley Institute of Living Scale (Shipley), measures intelligence, and was used to assess divergent validity. Intelligence was theoretically independent of SDCL, so scores on this measure were not expected to correlate with OCLI scores (Oddi, 1984).

In terms of convergent validity, LAS scores correlated significantly with OCLI scores, as expected, which supported the construct validity of the OCLI. Each ACL scale was correlated separately with the OCLI, and since many of these moderately positive correlations were significant, they provided further evidence of the OCLI's construct validity. Contrary to Oddi's (1984) expectation, scores on the I-E Scale did not correlate significantly with OCLI scores, failing to support the OCLI's construct validity. Evidence for discriminant validity was found, as the correlation between Shipley and OCLI scores, as predicted, was not significant. Thus, results of the construct validity analyses demonstrated, for the most part, that the OCLI is a valid instrument (Oddi, 1984). Construct validity of the OCLI should be further examined by correlating OCLI scores with scores on a variety of measures, not only with scores on self-reports (Oddi, Ellis, & Roberson, 1990).

Psychometric properties. In a study conducted to examine whether the underlying factor structure of the OCLI originally demonstrated by Oddi (1984) would pertain to a different sample, Harvey, Rothman, and Frecker (2006) collected OCLI data from a random sample of 250 medical students. The Cronbach's alpha value of .66 found in this study indicated moderate homogeneity, and the average item to total score correlation of $r = .40$, $p < .05$ indicated moderate consistency of the scale. Exploratory factor analysis was conducted to identify a number of possible factor solutions that might fit the sample data. For this sample, however, a confirmatory factor analysis revealed the most straightforward and logical outcome to be a four-factor result, which explained approximately 40% of the total variance. Factor one included six

items, and reflected two dimensions of Oddi's theory: cognitive openness and learning commitment. Factor two (eight items) appeared to represent the drive dimension. The third factor (five negatively worded items) appeared to measure both drive and cognitive openness. The fourth factor (five items) reflected commitment to learning. These SDL components were labelled: "[l]earning [w]ith [o]thers, [l]earner [m]otivation/[s]elf-[e]fficacy/[a]utonomy, [a]bility to be [s]elf-[r]egulating, and [r]eading [a]vidity" (Harvey et al., 2006, p. 197), respectively. The results of the factor analysis revealed that a solution with interdependent factors provided a better fit to the sample data than a solution with independent factors (Harvey et al., 2006).

Six (1989) conducted a study to determine whether the three factors underlying the OCLI, as identified by Oddi (1984), generalized to other samples. Three non-random samples were selected for this study. The author selected a sample of 328 New York business college students (called the Six sample). Six used sample data that had already been collected for two other related studies, including the data from Oddi's original study sample of 271 U.S. graduate students (called the Oddi sample), as well as data from a sample of 98 graduate students from a New York University (called the Landers sample). OCLI data for the participants from all three samples were analyzed.

Using factor analyses, Six (1989) intended to compare the factors generated from the Oddi (1984) sample data to those produced by the Six sample. First, separate factor analyses were conducted on the Six and Oddi data. Both factor analyses demonstrated three factors, which provided the first piece of evidence to support the generalizability of the factors produced by the OCLI across different samples. Next, the two sets of factors generated by the Six and Oddi samples were compared using the Landers sample data. Specifically, the results of both the Six and Oddi factor analyses were used to produce two sets of factor scores for each participant for

each of the three factors. A factor score represents a value an individual would obtain on a factor if it was an observable, or measured, variable. The two versions of factor scores on each factor for each individual in the Landers sample were then correlated. High correlations (above $r = .90$) between two versions of factor scores indicate that the factors produced by the two separate factor analyses for the two separate samples are equivalent.

For the Landers sample, the correlations between the two sets of factor scores, generated by the Oddi (1984) and Six (1989) factor analysis results, were above $r = .90$, $p < .05$ for each of the three factors, indicating that the factors revealed in the Six and the Oddi data were essentially the same. Furthermore, both the Six and Oddi factor analyses explained similar amounts of total variance. Unlike the results of the Oddi study, however, the results of this study did not provide support for a significant relationship between factors. In other words, findings from this analysis support the existence of independent factors (Six, 1989).

Although different studies employing the OCLI have demonstrated slightly different underlying factor structures, the factors identified, by Oddi (1984) and Harvey et al. (2006) for example, do generally appear to relate to the original three dimensions of SDCL identified by Oddi. Furthermore, Six (1989) demonstrated that the OCLI factors generalize fairly well across different samples. Findings regarding the relationships between factors have been contradictory, however.

Selecting a measure of SDL.

It is difficult to determine which measure, the SDLRS or the OCLI, is a more valid and reliable measure of SDL, as research has demonstrated numerous similarities, as well as a moderate positive correlation between scores on the two instruments (Landers, 1989).

Theoretically, the OCLI is a more appropriate choice for this study, since it was developed based on a personality view of SDL, which is the conceptualization endorsed in this study. Furthermore, the OCLI's factor structure has been better supported by research. For these reasons, the OCLI will be the measure used to operationally define SDL for the purpose of this study.

Personality measurement.

This section discusses the strengths and weaknesses of two of the most commonly used personality measures, and in doing so, hopefully provides an adequate justification for favouring the use of one over the other.

Myers-Briggs type indicator. The Myers-Briggs Type Indicator (MBTI) is one of the most commonly used measures of personality, developed by Myers and Briggs, in their attempt to translate Jung's theory of psychological types into a personality test. This brief, self-report tool provides an assessment of individuals' preferences on four bipolar scales, including "focus of attention", "information input", 'decision making", and "lifestyle" (Psychometrics Canada Ltd., 2015). By describing individuals on each of these four dichotomous dimensions, the MBTI is able to classify individuals into one of 16 different personality types, created by combining one's preferences on each of the four dimensions for one pole or the other. Upon completing the test, one's specific personality type can be identified by a four-letter code; each of the four letters represents the individual's preferred pole on one of the four dimensions (Psychometrics Canada Ltd., 2015).

To understand the 16 different personality types, it is important to appreciate the implications of each of the four bipolar dimensions. First, focus of attention reflects one's preference for focusing one's attention either on "people and things in the external world",

referred to as extraversion (E), or on "ideas or impressions in the inner world", called introversion (I). The next dimension, information input, refers to one's preference for gathering information by sensing (S), which involves "[g]ather[ing] details and facts that can be confirmed by experience", at one extreme, or by intuition (N), defined as "[g]ather[ing] ideas and see[ing] future possibilities". The third dimension, decision making, reflects one's preference for making decisions "by logic and analysis", identified as the thinking (T) preference, or "based on personal values", and is referred to as the feeling (F) preference. Finally, the fourth dimension reflects one's life orientation, and ranges from judging (J), reflecting a preference for "planning and deciding", to perceiving (P), involving a preference for "remaining open to new options" (Psychometrics Canada Ltd., 2015, para. 1).

Psychometric properties. Although it is a well-known and commonly used measure, Pittenger (2005) expresses several criticisms of the MBTI. For one thing, although the MBTI does appear to measure personality, Pittenger does not agree that it measures personality as defined by Jung's theory. For example, Jung theory initially only discussed three dimensions of personality; Myers and Briggs, in designing the MBTI, added the fourth, judging-perceiving, dimension (Pittenger, 2005).

Perhaps the most serious problem associated with the MBTI is its method of scoring and interpreting personality. Pittenger (2005) points out that both Jung's theory and the MBTI are based on the conceptualization of different personality types. According to this perspective, personality types differ qualitatively, not just quantitatively. Thus, personality type represents a discrete, not a continuous, variable. Logically then, within a particular personality type, one could expect to find considerable homogeneity, whereas between different personality types, one could anticipate finding substantial heterogeneity. By its nature, because it classifies individuals

on one of two polar dimensions for each of four dimensions, the MBTI should produce a bimodal distribution of personality data, with relatively few individuals scoring in the middle range on any given dimension. This distribution, though, has not been supported by empirical evidence. Specifically, although continuous scores on each dimension of the MBTI are supposed to be converted to letters prior to the interpretation of the results, if one examines the distribution of these continuous scores on any given dimension instead, the distribution is typically unimodal, with scores piling up around the middle, or average, range. In this way, MBTI results appear very similar to the scores observed on trait theory instruments, which operationalize personality as scores on a set of continuous trait variables. Specifically, on traits measures, scores generally assume a unimodal distribution, with the majority of individuals obtaining a score somewhere in the average range, not at one extreme or the other, on any given dimension. Thus, there is a lack of empirical evidence to suggest that the different personality types identified by the MBTI actually represent qualitatively different personality populations. Essentially, then, the categorical nature of the MBTI might make small differences between individuals appear to be more significant than they actually are because it classifies individuals into qualitatively different types rather than measuring them along dimensions that only vary quantitatively (Pittenger, 2005).

Another problem associated with converting continuous scores into categorical values, as the MBTI does by translating numerical scores into letter codes, is that it causes quite a bit of measurement detail about the variable to be lost. Essentially, this process sacrifices measurement precision. In particular, information about personality variability is lost, so the potential to use the personality data to predict behavioural outcomes, for example, is lost to some extent (Pittenger, 2005).

Next, Pittenger (2005) expresses concern regarding the test-retest reliability of the MBTI. At first glance, the test-retest reliability of the MBTI does not seem to be problematic, as it is similar to that of other personality assessments. Since the MBTI is based on Jung's personality theory, which suggests that personality is established early in life and becomes more or less stable by the time an individual reaches adulthood, one would predict very high test-retest reliability for the MBTI. Empirical evidence suggests, however, that the MBTI has test-retest reliability values similar to those that would be predicted for trait measures of personality (Pittenger, 2005).

Another indicator of problems with test-retest reliability was the finding that a substantial percentage of those retested with the MBTI were classified as a different type compared to how they were classified according to their initial testing. This was particularly likely to occur, not surprisingly, for those individuals who obtained an average rather than an extreme score on any of the dimensions. The inability of the MBTI to reliably classify individuals with average scores on a dimension is particularly concerning, since the unimodal distribution of personality data illustrates the large portion of respondents who score in the average range. In other words, the results produced for many individuals on the MBTI may be of questionable reliability. Some research suggests that a substantial minority of participants who completed the MBTI felt they were inaccurately classified by the instrument (Pittenger, 2005).

The construct validity of the MBTI has been called into question, as research involving factor analyses of MBTI data have failed to demonstrate the underlying factor structure of the instrument predicted by Jung's theory. Related to this concern is the finding that the dimensions appear to be correlated, which is contrary to what would be expected given the theory's discussion of orthogonal dimensions. Additionally, the extraversion-introversion scale was found

to be related to extraversion scales on other personality instruments. This finding might appear, at first glance, to provide convergent validity for the MBTI, but in fact, the correlations between the extraversion scales on the MBTI and other measures are not what the theory underlying the MBTI would predict, as extraversion was conceptualized very differently by Jung compared to how trait theorists defined it (Pittenger, 2005).

Most importantly, perhaps, the five-factor theory entirely accounts for the individual variance in personality explained by the MBTI. Surprisingly, this popular trait theory provides a better explanation for the factor structure revealed by MBTI data. Considering that the big five model is based on empirical evidence, while the MBTI has been developed mainly from theory, it is reasonable to suggest that the five factor theory might be a better model upon which to construct a measure of personality (Pittenger, 2005).

Personality measures based on the Five Factor Theory. As discussed previously, FFT is a widely accepted trait theory of personality, which suggests that individual differences can be explained by their variability on a combination of five abstract and fairly broad bipolar dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Considering that the FFT is the most popular and thoroughly researched approach to personality, it is not surprising that a number of personality assessment tools have been developed from it (Gosling, Rentfrow, & Swann, 2003).

NEO-PI-R. Likely the most thorough of these measures is McCrae and Costa's NEO Personality Inventory, Revised (NEO-PI-R), a test with 240 items that measures the big five traits generally, and six more specific and subordinate facets to each of the big five factors. Although this measure has good psychometric properties, it requires 45 minutes to complete, which makes it impractical for research studies involving the administration of several

instruments. Briefer measures have been developed to assess the five personality factors, and they have all been commonly used in research. For example, the NEO Five-Factor Inventory (NEO-FFI) includes 60 items, and takes approximately 15 minutes to complete, and the Big-Five Inventory (BFI) has 44 items, and takes five minutes to complete (Gosling et al., 2003).

Gosling et al. (2003) went on to develop even briefer personality tests based on the five-factor approach. Specifically, they developed the Five-Item Personality Inventory (FIPI) and the Ten-Item Personality Inventory (TIPI). Their study discussed both the development and psychometric evaluation of these two brief measurement tools. For the purpose of this dissertation, only the development and psychometric evaluation of the 10-item test will be discussed. While the convenience of a 10-item tool to measure personality has considerable appeal over a 44-item measure (BFI), there does not seem to be a significant time advantage to using the five-item over the 10-item instrument, especially if the five-item instrument suffers from additional psychometric limitations compared to the 10-item measure.

The 10-item instrument was designed to include two items for each dimension, one corresponding to each end of the spectrum. Two descriptors (borrowed from other instruments based on the five-factor model), were used to construct each of the ten items. For each item, participants were instructed to indicate, on a seven point Likert scale ranging from “disagree strongly” to “agree strongly”, the extent to which the two descriptors were characteristic of themselves (Gosling et al., 2003).

Psychometric properties. Psychometric properties of the instrument were evaluated by administering the TIPI, as well as several other instruments, to a sample of 1813 undergraduate students at the University of Texas at Austin. The majority of participants were women (65%), and/or Caucasian (62%). Specifically, the FIPI was assessed in terms of its construct (convergent

and divergent) validity by comparing its scores to those on the BFI. Its test-retest reliability was assessed by retesting a portion of the sample with the TIPI six weeks after the initial assessment. Finally, criterion validity was assessed by the correlating TIPI scores with those on other self-report measures whose relationships with personality had already been examined using existing personality measures (Gosling et al., 2003).

First, convergent validity was assessed by correlating each dimension on the TIPI with its counterpart on the BFI. High correlations, in this case, would provide support for the convergent validity of the TIPI. Indeed, correlations between the corresponding dimensions on the TIPI and BFI ranged from a low of $r = .65$ for openness to a high of $r = .87$ for extraversion. These relatively high values suggest that the dimensions thought to measure the same constructs on the two instruments actually do measure the same constructs (Gosling et al., 2003).

Divergent validity was assessed by examining the correlations between dimensions on the TIPI and the theoretically unrelated dimensions on the BFI. Divergent validity is considered to be adequate if each TIPI dimension has a low correlation with all other dimensions on the BFI (except, of course, with its counterpart dimension). Indeed, the inter-correlations between the non-counterpart dimensions on the TIPI and BFI ranged from a low of $r = .06$ to a high of $r = .36$). These relatively low correlations provide further support for good divergent validity. Together, adequate convergent and divergent validity support the argument that the overall construct validity of the TIPI is good. Furthermore, according to other results of this study, convergent validity for the TIPI was similar to that of other personality measures (Gosling et al., 2003).

As mentioned previously, to assess test-retest reliability of the TIPI, a subset of the sample completed the TIPI twice, six weeks apart. The correlation between the TIPI scores

between the first and second administration were reasonably high (r = .72), suggesting good test-retest reliability, but they were predictably lower than test-retest reliability demonstrated for the BFI (r = .80) (Gosling et al., 2003).

Finally, to assess criterion validity, the TIPI and BFI scores were both correlated with scores on an extensive list of other measures. For the purpose of this dissertation, it is not necessary to discuss all the details of these findings. It is simply relevant to note the reason for conducting this set of analyses, as well as to provide a brief explanation of the findings. These analyses were conducted to allow for a comparison of the TIPI and the BFI in terms of their relationships with these other measures. Theoretically, if the TIPI measures the same aspects of personality as the BFI, they should both demonstrate similar relationships with an assortment of other measures, and this is exactly what was found in this study. In other words, the correlations found for the BFI with other measures were similar to those for the TIPI with those same measures. Thus, the TIPI appears to have good criterion validity (Gosling et al., 2003).

It is encouraging to conclude that the TIPI might be a viable option for providing a reliable and valid assessment of personality as conceptualized by the five-factor theory. Interestingly, another brief (10-item) big five-measure was developed to measure personality under time restrictive conditions. Referred to as the BFI-10, this instrument was compared to other longer personality instruments, as well as to the TIPI, and was demonstrated to have good reliability and validity (Rammstedt & John, 2007). Thus, for the purpose of assessing personality for this dissertation, both brief measures appear to hold promise.

Selecting a personality measure.

Considering that the five-factor approach to personality is considered to be the superior theoretical framework in the context of this dissertation, it seems appropriate to select a

personality measure developed from this perspective. Furthermore, in the interest of encouraging students to participate in the study, and to decrease the likelihood that participants will get bored and careless in their responses, it seems logical to select a measure that is brief while still psychometrically sound. For this reason, the TIPI appeared to be the most reasonable choice for measuring personality in this study.

Conclusion

This section has outlined and justified the research method and statistical analyses to be used to address the goal of this dissertation. Details about the population of interest, as well as sampling procedures to be employed, were discussed. Finally, the data collection procedure, which involved administering self-report questionnaires to participants, was explained. A rationale for the selection of the measurement instruments to be used in this study, the OCLI for measuring SDL and the TIPI for measuring personality, was provided, and strengths and weaknesses of the instruments themselves were discussed. Next, the results chapter outlines the findings of this study and address whether hypotheses were supported or refuted.

Chapter 4: Results

The fourth chapter of this dissertation includes an overview of the key findings of this study. Since an important focus of the research is a comparison of the university and college subsets of the sample in terms of any notable differences in personality, SDL, or the relationship between them, the findings in this chapter are divided into three major sections: university, college, and Overall Sample. Descriptive statistics are provided and discussed to illustrate the characteristics of each subset of the sample, and inferential statistics are performed and interpreted to address hypotheses involving the relationship between SDL and personality, and any additional relevant findings pertaining to the relationships of SDL and personality with the demographic variables. The nature of the measures/data used and the data analysis procedure are outlined prior to discussing the study findings.

Measures/Data

The Ten-Item Personality Inventory (TIPI) was used to measure each personality dimension of interest to this study (openness, conscientiousness, extraversion, agreeableness, and neuroticism). Each personality component was measured using two Likert scale questions with response options ranging from disagree strongly (1) to agree strongly (7). The score for each dimension was calculated by adding the scores for the two relevant questions for that dimension, meaning that scores on each dimension potentially range from two to 14. A higher score corresponds to a higher self-perceived degree of each dimension. It is worth noting that, for each dimension, one of the two questions were reverse scored; however, prior to calculating overall scores for each dimension, each reverse scored item was reverse coded so that higher scores correspond to higher degrees of that dimension.

SDL was measured using the Oddi Continuing Learning Inventory (OCLI), which consists of 24 Likert scale questions that request a response ranging from strongly disagree (1) to strongly agree (7). Scores for each question were summed to obtain an overall SDL score, which can range from 24 to 168, with higher scores implying higher degrees of SDL. Five of the items on the SDL measure were also reserve scored, so these items were also reverse coded prior to calculating an overall SDL score so that higher scores on them correspond to higher degrees of self-perceived SDL.

Demographic Questionnaire items included participant's age, gender identity, marital status, highest level of education previously completed, as well as highest education level attained by both of their parents, type of post-secondary institution at which participant is currently enrolled, the program in which the participant is currently enrolled, the number of years required to complete the current program, their enrollment status (part-time or full-time), the year in which they are currently enrolled, their living arrangements, whether they are employed (and if so, how many hours, on average, they work during the semester), how their living and school expenses are being paid, and their overall academic average (percent) during their most recently completed academic semester.

Data Analysis

Data for participants who completed no questions or only demographic questions were deleted prior to performing any analyses because they could not be included in the main analyses that involved personality and SDL variables. Similarly, those who completed only the personality or SDL measure, or who only partially completed either measure, were not included in the analyses, as their overall scores for the variables of interest were incomplete and therefore impossible to calculate accurately.

Separate analyses for the university and college samples include univariate descriptive statistics for the demographic variables, and for SDL and personality. As well, inferential statistical analyses include those that examine the relationships between SDL and the personality dimensions, and also those of the demographic variables with SDL and personality. For the overall sample, descriptive statistics are largely omitted, except those for SDL and personality. This decision was made in order to avoid unnecessary repetition, since detailed descriptive statistics are provided separately for each subset of the sample. Instead, inferential analyses are performed to reveal significant relationships for the sample as a whole, and any similarities/differences between the university and college groups in terms of personality, SDL, or the relationship between them.

University Sample

A total of 204 university participants attempted the survey; however, since data for those who failed to complete the personality and/or SDL measures are not included in the results, the analyses are conducted with the participants (n = 161) who provided responses to all personality and SDL items. Some participants completed all personality and SDL items but failed to provide complete demographic data; these respondents are included in the analyses because they provided responses to the variables considered to be most relevant to the study. For the specific analyses discussed in this chapter, depending on the variables involved, the sample size varies slightly, as analyses conducted include data only for those who provided responses to the variables involved. Both descriptive and inferential analyses are performed and discussed for the university subset of the sample.

Descriptive statistics. Univariate descriptive statistics are calculated as frequencies for most of the nominal demographic questionnaire variables, while means and standard deviations are reported for the interval/ratio scale demographic, personality, and SDL variables.

Demographic variables. Of the 161 university participants, the majority were female (n = 138, 86%). Their ages ranged from 17 to 52 years, with an average of 19.51 years (SD = 4.90), and the majority were single (n = 134, 83%). Most reported their highest level of education previously completed to be a high school diploma or equivalent (n = 128, 80%). Highest level of education completed by participants' parents was most commonly reported to be a college diploma for both fathers (n = 40, 25%) and mothers (n = 52, 32%). Participants represented a variety of academic programs, including various Bachelor of Arts and Bachelor of Science programs, such as education, nursing, social work, business, etc. The majority of the participants were enrolled full-time (n = 148, 92%) in four-year programs (n = 105, 65%). Most of the participants (n = 150, 93%), were studying in the first year of their program, and living in residence (n = 108, 67%). Only a minority indicated that they were employed (n = 39, 24%). Most commonly, student loans (n = 103, 64%) were reported as the means by which participants were paying for school expenses, while for living expenses, parental/family contributions (n = 86, 53%) were the most commonly reported means of paying. Overall academic average for the most recently completed semester had a mean of 83.32 (SD = 8.47) and ranged from 40 to 98 percent.

SDL and personality.

Table 1

Means and Standard Deviations for SDL and Personality Dimensions for the University Sample

	Mean	Standard Deviation

SDL	104.83	14.27
Openness	10.33	2.10
Conscientiousness	10.85	2.48
Extraversion	8.39	2.99
Agreeableness	9.70	2.28
Neuroticism	7.98	2.94

As seen in Table 1, participants demonstrated relatively high scores on SDL, considering the OCLI has a maximum possible score of 168. Scores for openness, conscientiousness, and agreeableness were fairly high, while scores for extraversion and neuroticism were moderate, considering the maximum score on each personality dimension is 14.

Inferential statistics. Inferential statistics, including correlations and a linear regression analysis, address the main hypotheses regarding the relationships between SDL and the various personality measures. Additional correlational and group difference analyses examine the relationships of the demographic variables with SDL and the personality dimensions.

Addressing hypotheses. Hypotheses discussed in the third chapter predicted that SDL would correlate with both openness and conscientiousness. Among the university participants, this hypothesis was largely supported by correlational analyses, as SDL was found to correlate positively, albeit weakly, with both openness, $r(161) = .355$, $p = .000$, and conscientiousness, $r(161) = .321$, $p = .000$. Although not stated explicitly in the hypotheses, SDL was not expected to correlate with the other three personality dimensions: extraversion, agreeableness, or neuroticism. Contrary to expectations, a weak positive correlation was demonstrated between SDL and extraversion, $r(161) = .279$, $p = .000$, and a weak negative relationship was revealed

between SDL and neuroticism, $r(161) = -.261$, $p = .001$. As anticipated, no significant correlation was demonstrated between SDL and agreeableness, $r(161) = .115$, $p = .148$.

To further examine the hypotheses, a regression analysis was conducted to predict SDL using the five personality dimensions as predictors. The regression equation was significant, $F(5, 155) = 12.823$, $p = .000$, and explained 27 percent of the variance in SDL scores. Of the five personality factors included in the analysis, only openness, conscientiousness, and extraversion were found to be significant predictors of SDL.

Demographic variables with SDL/personality. No gender differences were found on SDL or any of the personality dimensions, with the exception of agreeableness, $t(154) = -3.090$, $p = .002$, on which females ($M = 9.89$, $SD = 2.25$) scored significantly higher than males ($M = 8.17$, $SD = 2.07$). The relationship of age with personality and SDL was not investigated because, despite the apparently wide age range, the majority of the sample ($n = 140$) was between 17 and 20 years old; only a few outliers contributed to the large age range, so it can be argued that the age variable reflected a restricted range. Marital status was not related to SDL or to any of the personality measures, as revealed by t-tests comparing the married/living together group to those who were single on SDL, openness, conscientiousness, extraversion, agreeableness, and neuroticism.

Highest level of education previously obtained by the participant was not related to SDL or personality, as t-tests revealed no significant differences between those with a high school diploma or equivalent compared to those with either some postsecondary, a diploma, or a degree on SDL or the personality dimensions. SDL and personality did not differ significantly by the highest level of education obtained the participant's father or mother, as revealed by one-way ANOVAs comparing participants' fathers or mothers with some high school, a high school

diploma, some college/university, a college diploma, an undergraduate degree, or a graduate degree on SDL and the personality factors.

Participant's current program was not analyzed in terms of its relationship with SDL or personality because numerous programs were represented, with only a few participants per program, thereby not allowing for meaningful comparisons of SDL and personality by program. Length of program was found to be unrelated to SDL and personality. T-tests also revealed no significant differences in SDL or personality by enrollment status. Year in program was not analyzed in terms of its relationship with SDL or personality as the majority of participants (n = 150) were in their first year.

ANOVAs revealed no significant differences in SDL or personality based on participants' various living arrangements. Also, according to t-tests, those who were employed did not differ significantly from those who were unemployed in terms of SDL or personality. Unfortunately, it was not feasible to examine the relationship between the average number of hours worked during the semester with SDL or personality due to problems with the wording of the question. Specifically, the question asked about average number of hours worked during the semester, but the researcher's intent was to gather information on hours worked on average per week during the semester. Since the question could be interpreted in more than one way, data collected for this item was omitted from analyses.

T-tests were conducted to compare students who did and did not rely on various means to pay for school expenses in terms of SDL and personality. While no significant difference in SDL or personality was found between those who used student loans and those who did not, between those who used employment income and those who did not, or between those who received parental/family contributions and those who did not, there was a significant difference in

conscientiousness between those who paid for school expenses using scholarships (M = 11.32, SD = 2.11) and those who did not (M = 10.21, SD = 2.79), t(119.478) = -2.768, p = .007.

In terms of how participants pay for living expenses, no difference in SDL or personality between those who did and did not use student loans, or between those who relied on parental/family contributions and those who did not were identified. However, in terms of SDL, there was a significant difference between those who did (M = 108.05, SD = 12.91) and those who did not (M = 101.31, SD = 14.93) use employment income to pay living expenses, t(159) = -3.069, p = .003. There was also a significant difference in conscientiousness between those who did (M = 11.36, SD = 2.10) and those who did not (M = 10.30, SD = 2.74) use employment income to pay for living expenses, t(159) = -2.763, p = .006. Those who relied on scholarships to pay for living expenses (M = 11.60, SD = 1.61) differed significantly from those who did not (M = 10.64, SD = 2.64) in terms of conscientiousness, t(89.785) = -2.660, p = .009.

Finally, correlations were performed to examine the relationship of overall academic average during the most recently completed academic semester with SDL and personality. A weak, positive correlation was demonstrated between SDL and overall academic average, r(152) = .242, p = .003. Of the personality dimensions, only conscientiousness correlated significantly (and specifically, positively) with overall academic average, r(152) = .254, p = .002.

College Sample

Although 140 college students responded to the survey, the statistical analyses do not include data for participants who did not provide responses to all personality and SDL items. Main analyses were performed on data from the participants (n = 95) who responded to every SDL and personality item, as overall SDL and personality dimension scores could only be

calculated for these participants. Data for participants who completed all personality and SDL items but failed to provide complete demographic data are included in the analyses. The sample size varies between analyses in some cases, depending on the number of participants who provided responses to the variables involved.

Descriptive statistics. Univariate descriptive analyses were calculated for each variable. Nominal scale demographic data are presented as frequencies, and means and standard deviations are calculated for interval/ratio scale demographic, personality, and SDL variables.

Demographic variables. The majority of the college participants (n = 95) included in the analyses were female (n = 70, 74%). Participants' ages ranged from 17 to 49 years, with an average of 20.58 years (SD = 5.21). The marital status of most respondents (n = 72, 76%) was single. The highest level of education previously completed was reported to be a high school diploma or equivalent by the majority of participants (n = 65, 68%). Most commonly, the highest level of education completed by participants' parents was reported to be a college diploma for both fathers (n = 28, 29%) and mothers (n = 33, 35%). Participants represented a variety of academic programs from diverse schools of interest within the college. Most respondents (n = 89, 94%) were enrolled full-time, typically in two-year programs (n = 47, 49%). The majority (n = 91, 96%) indicated that they were enrolled in the first year of their program at the time they completed the survey, and the most common housing situation was reported to be living in residence (n = 33, 35%). Only a minority of participants indicated that they were employed (n = 30, 32%). Student loans were reported as the means by which the majority of the participants were paying for school expenses (n = 65, 68%), as well as living expenses (n = 49, 52%). Overall average reported by respondents for the most recently completed academic semester had a mean of 80.22 (SD = 8.04) and ranged from 59 to 98 percent.

SDL and personality.

Table 2

Means and Standard Deviations for SDL and Personality Dimensions for the College Sample

	Mean	Standard Deviation
SDL	106.29	15.17
Openness	10.86	2.20
Conscientiousness	10.84	2.18
Extraversion	8.27	2.78
Agreeableness	9.41	2.26
Neuroticism	7.86	2.74

As illustrated in Table 2, college participants scored relatively high, on average, on SDL, openness, conscientiousness, and agreeableness. Average extraversion and neuroticism scores were moderate.

Inferential statistics. Inferential statistics were performed to address the main hypotheses regarding the relationships between SDL and the various personality measures using both correlations and a linear regression analysis. Additional correlational and group difference analyses were conducted to examine the relationships of the demographic variables with SDL and the personality dimensions.

Addressing hypotheses. As previously mentioned, SDL was hypothesized to correlate with openness and conscientiousness. Among the college participants, this hypothesis was partially supported, as SDL correlated positively, albeit weakly, with openness, $r(95) = 0.306$, $p = .003$. Contrary to expectations, SDL was not significantly associated with conscientiousness,

$r(95) = 0.005$, $p = .964$, but was found to correlate significantly with extraversion, $r(95) = 0.342$, $p = .001$. As expected, SDL did not correlate significantly with agreeableness or neuroticism.

A regression analysis was conducted to further examine the hypothesis that personality can be used to predict SDL, with SDL as the criterion variable and the five personality factors as the predictors. The regression equation was significant, $F(5, 89) = 4.313$, $p = .001$, and the model accounted for 15 percent of the variance in the SDL data. Openness and extraversion were the only significant predictors identified by the model.

Demographic variables with SDL/personality. No gender differences were revealed for SDL, but conscientiousness differed significantly between males ($M = 9.52$, $SD = 2.34$) and females ($M = 11.29$, $SD = 1.98$), $t(89) = -3.429$, $p = .001$), as did agreeableness, $t(89) = -3.830$, $p = 0.000$, on which males ($M = 7.81$, $SD = 1.66$) scored lower, on average, than females ($M = 9.81$, $SD = 2.22$). Openness, extraversion, and neuroticism did not differ between males and females. Age was not examined in terms of its relationship with personality and SDL because, although participants ranged in age from 17 to 49 years, giving the impression of a wide range, most college respondents ($n = 74$) were between 17 and 21 years of age.

According to t-tests comparing the married/living together to the single participants, marital status was not related to SDL. Openness, extraversion, and neuroticism also did not differ by marital status; however, conscientiousness differed significantly by marital status, $t(90) = -2.389$, $p = .019$, with those who were married or living together ($M = 11.85$, $SD = 1.81$) scoring higher, on average, than single ($M = 10.58$, $SD = 2.17$) respondents. Agreeableness was also significantly higher among married/living together participants ($M = 10.55$, $SD = 2.31$) compared to single participants ($M = 9.06$, $SD = 2.18$), $t(90) = -2.678$, $p = .009$.

To determine whether highest level of education previously obtained by the participants was related to SDL or personality, t-tests were performed to compare participants with a high school diploma or equivalent to those with either some postsecondary, a diploma, or a degree on SDL and personality. SDL scores were significantly higher among those with at least some postsecondary education (M = 111.79, SD = 18.60) compared to those with a high school diploma (M = 104.38, SD = 12.93), $t(91) = -2.206$, $p = .030$. It is notable that none of the personality variables differed by level of education previously obtained by the participant.

One-way ANOVAs were conducted to examine differences in participants' SDL and personality based on their parents' level of education (some high school, high school diploma, some college/university, college diploma, undergraduate degree, or graduate degree). No differences based on father's level of education were found for participants' SDL or personality, except on openness, $F(4,86) = 3.882$, $p = .006$. Posthoc analyses revealed that openness was significantly lower among participants whose fathers had some high school (M = 9.55, SD = 2.24) compared to participants who fathers had a high school diploma (M = 11.62, SD = 1.80), a college diploma (M = 10.75, SD = 2.34), or a degree (M = 12.09, SD = 1.30). Participants' SDL did not differ significantly by their mothers' level of education.

In terms of openness, conscientiousness, and agreeableness, there were no differences between participants based on their mother's education level. However, differences in participants' extraversion based on mother's education level were demonstrated, $F(4,86) = 2.517$, $p = .047$. Specifically, posthoc tests demonstrated that participants whose mothers had some college/university (M = 6.00, SD = 1.31) had significantly lower extraversion scores, on average, compared to those whose mothers had a college diploma (M = 8.91, SD = 2.58) or a degree (M = 8.48, SD = 3.03). Participants' neuroticism also differed significantly by mother's

education level, $F(4,86) = 2.668$, $p = .038$. According to posthoc analyses, participants whose mothers had some high school ($M = 8.60$, $SD = 2.12$) or some college/university ($M = 9.13$, $SD = 2.95$) had significantly higher average neuroticism scores than participants whose mothers had a high school diploma ($M = 6.37$, $SD = 2.65$). Those whose mothers had a high school diploma also differed significantly on neuroticism from those whose mothers had a degree ($M = 8.62$, $SD = 3.19$).

As was the case with the University subset of the sample, the relationship of current program with SDL and personality was not analyzed for College participants because, once again, numerous programs were represented, with only a few participants per program. It was therefore not possible to perform meaningful comparisons of programs with respect to SDL and personality. Length of program was not related SDL or personality, and differences in SDL and personality by enrolment status (part-time vs. full-time) could not be analyzed as only a small minority ($n = 2$) indicated part-time status, while the majority ($n = 89$) indicated full-time status. The relationship of year in program with SDL or personality also could not be examined as the majority of participants ($n = 91$) were in their first year, with only one participant indicating that they were in their second year of study.

ANOVAs revealed no significant differences in SDL or personality based on various living arrangements, except for the agreeableness dimension, $F(4,87) = 3.666$, $p = .008$. Posthoc tests revealed that agreeableness was significantly lower among those who lived with roommates off campus ($M = 8.00$, $SD = 2.69$) compared to those who lived in residence ($M = 9.33$, $SD = 1.53$), with parents ($M = 10.82$, $SD = 1.66$), or with a partner/spouse ($M = 10.20$, $SD = 2.27$). Agreeableness also differed between those who were employed ($M = 10.27$, $SD = 2.26$) and those who were unemployed ($M = 9.08$, $SD = 2.11$), $t(88) = -2.450$, $p = .016$. However, no

significant differences were found between those who were employed and those who were not on any of the other personality dimensions, or on SDL. As previously mentioned under the University results section, the relationship of average number of hours worked during the semester with SDL or personality could not be analyzed due to problems with the wording, and therefore interpretation, of the question.

T-tests were performed to compare students who did and did not use various means to pay for school expenses on SDL and personality. No significant differences were identified between those who did and did not use employment income to pay for school expenses on SDL or any of the personality measures. On the other hand, a significant difference was noted between those who did (M = 8.98, SD = 2.27) and did not (M = 10.33, SD = 1.99) use student loans to pay for school expenses in terms of agreeableness, $t(93) = 2.798$, $p = .006$. Conscientiousness varied significantly, $t(15.963) = -2.221$, $p = .041$, according to whether participants did (M = 11.80, SD = 1.32) or did not (M = 10.73, SD = 2.24) use scholarships to pay for their school expenses. Those who relied on parental/family contributions to pay for school expenses did not differ significantly from those who did not in terms of SDL or any of the personality measures.

T-tests were also performed to compare SDL and personality between those who did and did not use various sources of income to pay for living expenses. There was no difference in SDL or personality between those who did and did not use student loans, between those who did and did not rely on employment income, or between those who relied on parental/family contributions and those who did not. The difference between those who used scholarships and those who did not could not be analyzed because only a few participants (n = 3) indicated that they relied on scholarships to pay for living expenses.

SDL and overall academic average had a nonsignificant correlation for this subset of the sample, $r(78) = 0.004$, $p = .974$. None of the personality dimensions were significantly associated with overall academic average among the college sample.

Overall Sample

While 344 participants attempted the survey, due to incomplete SDL and personality data for some, analyses for the entire sample of university and college students were performed on the 256 respondents who answered all SDL and personality items.

Descriptive statistics for demographic variables, SDL, and personality dimensions.

To avoid unnecessary repetition, as detailed descriptive statistics were already provided separately for each subset of the sample, and because the focus of this study is on the differences between the university and college samples in terms of SDL, personality, and the relationship between them, for the overall sample, descriptive statistics are provided only for SDL and personality. Descriptive statistics for demographic variables for each institution are summarized in Table 4.

Table 3

Means and Standard Deviations for SDL and Personality Dimensions for Overall Sample

	Mean	Standard Deviation
SDL	105.37	14.60
Openness	10.53	2.15
Conscientiousness	10.85	2.37
Extraversion	8.34	2.91
Agreeableness	9.59	2.27

Neuroticism	7.93	2.86	

Table 3 shows that, for the overall sample, SDL scores were fairly high, on average. Openness, conscientiousness, and agreeableness scores were fairly high as well. Scores on extraversion and neuroticism were, on average, moderate.

Table 4

Comparison of the University and College Descriptive Statistics for Demographic Variables

	University Sample	College Sample
Percent Female	86%	74%
Average Age	M = 19.51 (SD = 4.90)	M = 20.58 (SD = 5.21)
Age Range	17-52	17-49
Percent Single	83%	76%
Percent with High School Diploma	80%	68%
Percent of Fathers with College Diploma	25%	29%
Percent of Mothers with College Diploma	32%	35%
Program Enrolment	Variety	Variety
Percent Enrolled Full-Time	92%	94%
Modal Program Length	65% (4-year)	49% (2-year)
Percent in First Year of Program	93%	96%
Percent Living in Residence	67%	35%
Percent Employed	24%	32%

Modal Method of Paying for School Expenses	64% (student loans)	68% (student loans)
Modal Method of Paying for Living Expenses	53% (parental/family contributions)	52% (student loans)
Academic Average	M = 83.32 (SD = 8.47)	M = 80.22 (SD = 8.04)
Academic Average Range	40-98%	59-98

Inferential statistics addressing hypotheses. To avoid repetition and the inclusion of unnecessary detail, for the overall sample, inferential statistics do not examine the relationships of demographic variables with SDL or personality. Instead, the relationship between SDL and personality among the entire sample is examined using correlations and a simple linear regression. As well, t-tests are used to examine differences in SDL and personality dimensions by institution. Finally, Fisher's *r*-to-*z* transformations along with z-tests are used to compare the significant SDL-personality dimension correlations between the university and college to determine if they differ significantly.

First, correlations were performed to examine whether SDL correlated significantly with any of the personality dimensions among the entire sample. As predicted by the hypotheses developed in third chapter of this dissertation, for the overall sample, SDL correlated significantly with openness, $r(256) = .339$, $p = .000$, and conscientiousness, $r(256) = .208$, $p = .001$. Although not anticipated, SDL also correlated with extraversion, $r(256) = .300$, $p = .000$, and neuroticism, $r(256) = -.236$, $p = .000$. Agreeableness was the only personality dimension that was not found to have a significant relationship with SDL, $r(256) = .092$, $p = 142$.

A regression analysis was conducted to examine whether personality factors could be used to predict SDL for the entire sample of participants. The regression equation was significant, $F(5,250) = 14.951$, $p = .000$, and the model accounted for 21.5 percent of the variance in SDL scores. Agreeableness was the only personality dimension not found to be a significant predictor in the model, and therefore the only personality dimension that did not account for variability in SDL scores.

According to t-tests performed to compare the university and college sample, there were no significant differences between the institutions in average SDL score, or any personality dimension. As evidenced in Table 5, mean scores for each measure are very similar across subsets of the sample.

Table 5

Comparison of the University and College Means and Standard Deviations for SDL and Personality Dimensions

	University Sample	College Sample
SDL	104.83 (14.27)	106.29 (15.17)
Openness	10.33 (2.10)	10.86 (2.20)
Conscientiousness	10.85 (2.48)	10.84 (2.18)
Extraversion	8.39 (2.99)	8.27 (2.78)
Agreeableness	9.70 (2.28)	9.41 (2.26)
Neuroticism	7.98 (2.94)	7.86 (2.74)

Finally, as mentioned in chapter three, it possible that the relationship between SDL and any given personality dimension may not be consistent across subsets of the sample, specifically,

across institutions. To determine whether the relationship between SDL and personality differs between University and College participants, the discrepancy between the correlations for the two institutions was examined for each pair of variables (SDL-personality dimension). To accomplish this, Fisher's *r*-to-*z* transformations were performed for each of the SDL-personality dimension correlations. Then, a *z*-test was performed to examine the difference between the correlation values for the two subsets of the sample for each SDL-personality dimension variable pair.

First, the correlation between SDL and openness was significant among both the university, $r(161) = .355$, $p = .000$, and college, $r(95) = 0.306$, $p = .003$, subsets of the sample. Fisher's r-to-z transformation was performed for both of these correlation values, and a subsequent *z*-test determined that the difference between these values was not significant, $z = .42$, $p = .675$. The correlation between SDL and extraversion was also significant for both University, $r(161) = .279$, $p = .000$, and College participants, $r(95) = 0.342$, $p = .001$. The difference between these correlations was analyzed, and once again, the *z*-test demonstrated no significant difference in relationship between institutions, $z = .53$, $p = .596$. The relationship between SDL and conscientiousness, $r(161) = .321$, $p = .000$, while significant among the university participants, was not significant among the college respondents, $r(95) = 0.005$, $p = .964$. It is important not to assume that a difference between correlation coefficients is significant simply because one of the correlations is significant and the other is not, so for this reason, a *z*-test was performed to examine this difference; the results illustrated a significant difference between institutions for the SDL-conscientiousness correlation, $z = 2.50$, $p = .012$. Similarly, the relationship between SDL and neuroticism was significant for the university sample, $r(161) = -.261$, $p = .001$, but not for the college sample, $r(95) = -.194$, $p = .060$. The *z*-test comparing these

correlation coefficients demonstrated no significant difference, $z = .54$, $p = .589$. The SDL-agreeableness relationship was nonsignificant for both the University, $r(161) = .115$, $p = .148$, and College, $r(95) = .065$, $p = .534$, samples. The z-test revealed no significant difference between the institutions for the relationship between SDL and agreeableness, $z = .38$, $p = .704$.

Chapter Summary

This fourth chapter of the dissertation presented the key findings of this study. It began by outlining the measures and nature of the data collected, as well as the data analysis procedures employed. It separately outlined both descriptive and inferential statistical analyses for the university, college, and overall sample. Descriptive statistics included frequencies, means, and standard deviations, depending on the scale of measurement of the variable, and served to summarize the characteristics of both subsets (institutions) within the sample and the overall sample. Inferential statistics, which included correlations and regressions, examined the relationship between SDL and personality separately for each subset of the sample, and for the sample as a whole. T-tests and ANOVAs also examined differences in SDL and personality based on demographic variables. For the overall sample, t-tests allowed for comparisons between the university and college groups in terms of average SDL and personality scores, and Fishers r-to-z transformations and z-tests examined the consistency of the relationships between SDL and the personality dimensions across subsets of the sample.

Chapter 5: Discussion

The fifth chapter of this dissertation provides a discussion and interpretation of the key findings of this project. It begins by providing a brief overview of the purpose and methodology of the study. It then summarizes and discusses the results, which are presented in the form of university and college sample differences in four main areas: demographic variables, self-directed learning (SDL) and personality differences by demographic variables, SDL and personality descriptive statistics, and SDL-personality correlations/regressions. Then, the relationships between SDL and personality for the overall sample are discussed. Next, limitations of the current study are considered, followed by possible future research. Finally, an overall conclusion provides an overview of the main contributions of this research.

Overview of Purpose and Methodology

As mentioned in the first chapter, the purpose of this dissertation is to examine the relationship between SDL and personality, and also to examine whether this relationship is consistent across a college and university sample. A potential benefit to understanding this association is the ability to predict SDL from personality characteristics, and thereby, who will be likely to engage in SDL or to benefit from an environment that fosters such learning. Another benefit is the development of a better definition and understanding of SDL as a construct, as an association between SDL and personality might suggest that SDL, at least partially, involves a particular set of personality characteristics. Self-directed learning (SDL) is a worthwhile construct to examine, as previous research indicates that it predicts academic success (Cazan & Schiopca, 2014; Lounsbury, Levy, Park, Gibson, & Smith, 2009) and contributes to lifelong learning (Abd-El-Fattah, 2010; Bolhuis, 2003).

An additional aim of this dissertation was to examine SDL, not as an instructional process, as it is most commonly considered, but as a personality characteristic or set of characteristics (Oddi, 1987). For this reason, the Oddi Continuing Learning Inventory (OCLI), which conceptualizes SDL as a personality factor, was used to measure SDL, rather than the more commonly used Self-Directed Learning Readiness Scale (SDLRS) (Ryan, 1998). The Ten-Item Personality Inventory was selected to measure personality because, despite its brevity, it demonstrates adequate psychometric properties, including adequate test-retest reliability and both convergent and discriminant validity (Gosling, Rentfrow, & Swann, 2003). Furthermore, it is based on the McCrae and Costa's (1996) five factor theory of personality, which is well supported by empirical evidence (McCrae & Costa, 1996).

An online survey link was emailed to both the college and university students in the Fall of the first year of their postsecondary program, and data were obtained from a convenience sample of students who opted to complete the survey. In addition to SDL and personality, demographic data were also collected, as such information has the potential to explain differences between the university and college sample in terms of SDL and personality measures. Hypotheses predicted that two personality dimensions (openness and conscientiousness) would correlate positively with SDL, and could thereby significantly predict SDL scores. It was also hypothesized that the relationships between SDL and each personality dimension might differ by institution. To examine these hypotheses, to identify any incidental findings, and also to provide an overview of sample characteristics, various inferential and descriptive statistics were performed on the data.

Demographic Comparison

As mentioned in the Chapter Four, demographic variables were not the main focus of this investigation. Since a comparison of the college and university subsets of the sample in terms of SDL, personality, and their relationship was of interest; however, it is important to identify and discuss demographic differences between the institutions. Such differences might explain any differences in terms of SDL and personality.

Although the majority of participants at both institutions were female, the university sample had a significantly larger percentage of females (87.3%) than the college (75.3%). A likely explanation for the fairly large majority of female respondents in general is that women are more likely than men to participate in an online survey (Smith, 2008). In addition, these differences may also reflect, at least partially, the gender gap that exists in education at the postsecondary level; specifically, among Canadians between 25 and 64 years of age, only 83 men for every 100 women complete postsecondary education (The Conference Board of Canada, 2018).

The institutions were very similar with respect to an average age of 20 years, and in terms of an age range between 17 and approximately 50. It is worth noting that the average age may be slightly misleading, as a few considerably older participants caused the age distribution to be positively skewed. Since most participants were between 17 and around 20 years of age, they were likely recent high school graduates in their first year of postsecondary school. For this reason, age did not vary much for the college, university, or overall sample.

Of the university sample, 83.2% identified as single, compared to 75.8% at the college, but this difference was not significant. In other words, the majority of the sample, regardless of institution, identified as single. Research involving 236 nursing professionals in Spain found

demographic variables like relationship status to be related to personality (Gonzalez Gutierrez, Jimenez, Hernandez, & Puente, 2005). For this reason, SDL and personality, and their association, may also differ by marital status.

In terms of highest level of education previously completed, 79.5% of the university sample and 68.4% of the college sample reported high school diploma or equivalent, and this discrepancy between institutions was nonsignificant. These data suggest that the majority of participants were enrolled in their first semester of postsecondary education at the time of data collection for this project, suggesting they might also be experiencing their first opportunity to demonstrate SDL. With respect to the highest level of education completed by participants' parents, fathers (24.8%) and mothers (32.3%) of the university participants, as well as fathers (29.5%) and mothers (34.7%) of the college participants, most commonly reported having a college diploma. Type of institution was significantly related to both mothers' and fathers' highest education level completed. Specifically, parents of the university participants tended to have obtained higher levels of education than parents of the college participants.

At both institutions, respondents represented a wide range of programs. Although it did not make sense to include the program variable in statistical analyses, as there were only a few students in some programs represented, it is fair to say that the sample provided a diverse group of students in terms of academic major/program. If anything, this diversity helped to contribute to variability on each personality dimension, allowing for more accurate correlations involving these variables, as research has demonstrated a relationship between college students' personality scores on the Sixteen Personality Factor Questionnaire (16 PF) and academic majors (Devoge, 1975).

At both institutions, over 90% of respondents were enrolled full-time, which provides, at least to some extent, homogeneity in the sample with respect to degree of involvement in school. There was, not surprisingly, a relationship between institution and length of program. At the university, 65.2% were enrolled in four-year programs, whereas almost half (49.5%) were enrolled in two-year programs at the college. This is not surprising, as many college programs take less time to complete than most university programs. Over 90% of participants from each institution were enrolled in the first year of their program. As mentioned in Chapter Three, students in their first year of postsecondary school were selected for this study because they are potentially in a position to engage in SDL for the first time. That being said, data from upper year students who completed the survey were included in the analyses. Differences between upper and first year students would be an interesting area to examine in a future study, but since only a minority of participants in this study were from upper years, differences based on year in program could not be analyzed in this study.

Living arrangements differed among participants according to institution. At the university, 67.1% were living in residence, compared to 34.7% of college students. The college students (n = 19) were more likely to live off-campus with roommates than were the university students (n = 9). These differences are potentially important, as research indicates that living in residence may promote positive academic outcomes through its influence on student involvement and engagement with their postsecondary institution (Turley & Wodtke, 2010).

Regardless of institution, only a minority of participants indicated that they were employed. Merely 24.2% of the university respondents indicated they were employed, compared to 31.6% at the college; this difference was not significant. These percentages are lower than the

45.4% employment rate among postsecondary students in Canada during the 2009/2010 school-year (Marshall, 2010).

For both the university (64.0%) and college (68.4%), student loans were most commonly reported as the means by which students paid for school expenses. University participants were significantly more likely than college participants to use employment income, scholarships, and parental/family contributions for school expenses. It is possible that scholarships are more available to university compared to college students. The college (51.6%) participants were also most likely to use student loans to pay for living expenses, whereas university participants (53.4%) were most likely to rely on parental/family contributions for living expenses. As mentioned previously, parents of the university sample tended to have higher education levels than college students' parents, so it is possible that they have more money to contribute to their children's education.

Overall academic average for the most recently completed semester was significantly higher for the university participants, with a mean of 83.32 (*SD* = 8.47) than for the college participants, with a mean of 80.22 (*SD* = 8.04). Although this difference was statistically significant, it is not large or necessarily meaningful. Furthermore, the accuracy of academic average data is somewhat questionable, as this information was likely generated from participants' memory.

Relationships between Demographic Variables and SDL/Personality

Next, now that the demographic differences between institutions have been examined, it is important to identify differences in personality and SDL that can be attributed to demographic differences. Such differences may help to explain different interrelationships between SDL and

personality across institutions. Nevertheless, it is interesting to note that the institutions were similar with respect to SDL and personality.

While some research has demonstrated a relationship between gender and SDL (Oddi, 1986), SDL (OCLI scores) did not differ between males and females in this study. Some personality differences were found between males and females; however, these differences were not consistent across institutions. At both institutions, females scored higher than males on agreeableness. Among the college sample only, females scored higher than males on conscientiousness. Openness, extraversion, and neuroticism did not differ by gender at either institution. Cross-cultural research from 55 nations, including 17, 637 participants, indicated that, for most of the nations examined, women scored higher on four of the Big Five personality traits, including conscientiousness, agreeableness, extraversion, and neuroticism. With respect to openness, sex difference findings were inconclusive (Schmitt, Realo, Voracek, & Allik, 2008). In this study, sex differences were demonstrated only on agreeableness and conscientiousness, suggesting that the sexes were more similar in terms of personality than they were in other research. Perhaps because the sample consisted of postsecondary students only, fewer gender differences were demonstrated than have been seen in some other studies. In other words, a sample of postsecondary students may be more homogenous with respect to personality than the larger, more diverse samples examined in many studies.

In this study, the relationship of age with SDL and personality could not be examined statistically due to the restricted age range of participants. In some previous research studies, age has been found to correlate positively with measures of SDL (Brockett, 1985; Oddi, 1986). Furthermore, age-related changes in the Big Five personality traits, specifically between young and middle adulthood, have also been demonstrated cross-culturally by both cross-sectional and

longitudinal research; neuroticism, extraversion, and openness tend to decline with age, while agreeableness and conscientiousness generally increase (McCrae et al., 1999). However, the aforementioned findings could not be verified in the current study.

Marital status was unrelated to SDL and personality at among the university sample. For the college sample, although marital status was unrelated to SDL, openness, extraversion, or neuroticism, both conscientiousness and agreeableness varied by marital status. Specifically, married or living together participants scored higher than single respondents on both personality measures. While, previous research has not demonstrated a relationship between SDL and marital status (Caffarella & O'Donnell, 1987), evidence does suggest a link between marital status and personality; for example, neuroticism and low agreeableness may predict behaviours that are harmful to relationships (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). If differences in personality are related to marital status, this relationship might explain, to some extent, differences in personality across populations, and thereby, differences in the relationship between personality and SDL across populations.

Level of education obtained by the participant was unrelated to personality at either institution. While SDL did not differ according to level of education achieved by the participants at the university, those at the college with a high school diploma had lower SDL scores than those with at least some postsecondary education. It is difficult to say whether SDL is related to participant's level of education based on the results of this study, as the relationship was significant only for one subset of the sample. Perhaps schooling may promote SDL for some but not for others, depending on what they are interested in learning about. Some previous research has failed to demonstrate a significant relationship between SDL and parents' education level, or education level of the participant (Oddi, 1986). Brockett (1985) goes so far as to argue that "self-

directed learning might be antithetical to schooling" (p. 22), insofar as schooling may encourage conformity and thereby discourage creativity. This somewhat extreme conclusion may be at least somewhat supported by research, as a meta-analytic review of studies on the relationship between SDL and several other constructs found a significant positive relationship between SDL and creativity (Edmondson, Boyer, & Artis, 2012). This is not to say that creativity is a necessary prerequisite for SDL, but it is perhaps reasonable to hypothesize that highly structured learning environments that stifle creativity might have a negative impact on SDL.

At the university, SDL and personality did not differ according to the participants' parents' highest level of education obtained. At the college, only openness differed by father's level of education. Specifically, openness was lowest among participants whose fathers had less than a high school diploma. Extraversion and neuroticism differed by mother's level of education. Those whose mothers had only some college or university scored lower on extraversion than those whose mothers had a diploma or degree. Neuroticism was lowest among those whose mothers had a high school diploma. According to existing research, SDL and parents' education level are not associated (Oddi, 1986).

Differences between programs in terms of SDL and personality, if any existed, could not be analyzed at either institution, due to the small number of participants in many of the programs. Although differences could not be identified in this study, previous research has found differences in each of the Big Five personality dimensions between students in different academic programs (Vedel, Thomsen, & Larsen, 2015). Thus, it is quite possible that, with larger numbers of participants in each program/major, differences in personality might be revealed. While research does suggest that experiential learning environments may better promote readiness for SDL than traditional learning contexts (Jiusto & DiBiasio, 2006), it is difficult to

find research supporting the notion that students with different propensities for SDL select different learning experiences, or even different academic majors/programs for that matter. Length of program was not related to personality or SDL. Most students were enrolled full-time, so differences in SDL and personality were not examined based on status. Year in program was also not examined, as the majority of participants were in their first year.

Among university participants no differences in SDL or personality were found among participants across different living arrangements. Among college participants, only agreeableness differed according to living arrangements, with those who lived with off-campus roommates scoring lower than those with other living arrangements. Using the Minnesota Multiphasic Personality Inventory (MMPI), previous research has demonstrated personality differences based on living arrangements among first year university students (Valliant & Scanlan, 1996). According to the results of this study, some personality differences may exist between students with different living arrangements; it is possible that such discrepancies might contribute to differences in the relationship between SDL and personality across different populations.

For the university participants, no differences were found between those who were and those who were not employed in terms of SDL or personality. Among the college respondents, those who were employed demonstrated higher agreeableness than those who were unemployed. Perhaps those who behave agreeably are more likely to obtain and maintain employment.

Among university participants, students did not differ in terms of SDL or personality based on whether they did or did not use various means to pay for school expenses, except that those who used scholarships tended to be more conscientious than those who did not. At the college, conscientiousness was also higher among those who used scholarships to pay for school

expenses than among those who did not. Those who did not use student loans were more agreeable than those who did.

In terms of paying for living expenses, university participants who used employment income had higher SDL and conscientiousness than those who did not. Conscientiousness was also higher among those who used scholarships than among those who did not. For the college respondents, no differences were demonstrated based on whether or not participants used various means to pay. Higher conscientiousness among those who used scholarships for expenses may reflect a tendency for conscientious students to be more likely to study hard, earn good grades, and thereby receive scholarship money.

SDL was directly associated with academic average, albeit weakly, but this was the case only for the university sample. Some research has failed to demonstrate a significant relationship between SDL, as measured by the OCLI, and academic performance measures, such as GPA, among postsecondary students (Francis & Flanigan, 2012). However, other measures of SDL, also based on the personality perspective, such as the 10-item Self-Directed Learning Scale (SDLS), have positively correlated with GPA among undergraduate students (Zhoc & Chen, 2016). Of the personality variables, only conscientiousness was found to have a (weak, positive) relationship with academic average. This result appears to be in line with existing research findings, as a meta-analysis of recent research examining the relationship between personality and academic achievement at the postsecondary level consistently revealed conscientiousness to be positively associated with academic performance (O'Connor & Paunonen, 2007). Other research has demonstrated conscientiousness and openness to be predictive of GPA among students enrolled in some majors (Vedel, Thomsen, & Larsen, 2015). Interestingly, this relationship was found only for the university sample. For the college sample, none of the

personality variables correlated with academic average. It is possible that the university sample represents a more homogenous group than the college sample does, at least in terms of demographic variables.

Comparing Institutions on SDL and Personality Descriptive Statistics

The college and university samples were remarkably similar with respect to overall descriptive statistics for SDL and personality. Specifically, institutions did not differ significantly on any of those measures. For each subset of the sample, and for the overall sample, SDL scores, in addition to those on openness, conscientiousness, and agreeableness were quite high, whereas those for extraversion and neuroticism were moderate.

Specifically, SDL scores, as measured by the OCLI, had an average of approximately 105 to 106 out of a total possible 168, with a standard deviation of 14 to 15. Although this average seems relatively high considering the maximum obtainable score on the instrument, compared to the findings of other studies that used the OCLI, the average for this sample is somewhat lower. For example, the study designed by Oddi (1986) to develop and validate the OCLI revealed an average OCLI score of 123.63 (*SD* = 19.03) among a sample of 271 participants, including law, adult education, and nursing graduate students. Another study that examined the underlying factor structure of the OCLI, discussed previously, demonstrated an average OCLI score of 126.1 (*SD* = 13.4) among a sample of 280 medical students from the University of Toronto (Harvey, Rothman, & Frecker, 2006). Finally, a study that investigated the construct validity of the OCLI, which included 126 female nurses with an average age of 36.63 years and employed at a community hospital in the Midwest, produced an OCLI average of 126.1 as well (Oddi, Ellis, & Roberson, 1990). For the overall sample in this study, the mean was somewhat lower on the OCLI, at least compared to other studies, perhaps because the previous studies examined a more

homogenous set of participants involved in schooling or careers typically requiring many years of postsecondary education.

Also, openness, conscientiousness, and agreeableness averages were fairly high for this sample, specifically, between nine and 11 out of a maximum of 14 points. Extraversion and neuroticism were more moderate, at around eight out of 14 points. A standard deviation between two and three was consistent for each personality dimension, regardless of institution.

Comparing SDL-Personality Correlations between Institutions

This section of the discussion directly addresses hypotheses outlined in Chapter Three, as it discusses not only relationships between SDL and specific personality dimensions but also differences between institutions in terms of the strength and direction of these relationships. Before discussing specific correlations, it is important to mention that each correlation was performed both with and without any outliers included on the variables involved to determine whether they had an impact on the correlation value. Results demonstrated no major changes to the coefficient values when outliers were included versus when they were not included in the analyses. In other words, the outliers did not impact the direction or strength of the relationships, nor their significance.

Furthermore, another potential issue that can influence correlation values is truncated range, which occurs when one or both variables have very low variability. Such a phenomenon can cause the obtained correlation value to be deceptive, in other words, poorly reflective of the nature of the true relationship. For this reason, SDL and each personality variable was examined separately for each institution to be sure that none had a truncated range. This phenomenon did not appear to be an issue, as SDL and all personality measures demonstrated considerable variability.

Interestingly, as predicted by the hypothesis regarding differences between institutions, the relationships between SDL and personality dimensions were not all consistent across institutions. Consistency between institutions in terms of the SDL-personality was demonstrated for openness, extraversion, and agreeableness. Specifically, openness was significantly, and positively, correlated with SDL at both institutions. This consistency is not surprising as openness has frequently been found to correlate with SDL in previous research (Cazan & Schiopca, 2014; Kirwan et al., 2010; Lounsbury et al., 2009). This relationship was also predicted by one of the hypotheses in this study. Extraversion correlated significantly with SDL at each institution also, although this relationship was not predicted by hypotheses. Agreeableness did not correlate with SDL for either subset of the sample, which was anticipated.

Inconsistency between institutions in the SDL-personality association was observed for both conscientiousness and neuroticism. Perhaps most interesting, conscientiousness was significantly related to SDL among the university participants, but not among the college respondents. Hypotheses predicted a relationship between SDL and conscientiousness. Neuroticism was significantly and indirectly associated with SDL for the university sample, but not the college sample, but the difference between these correlations was not large enough to be significant, likely because the relationship was nearly significant for the college sample. An indirect association between neuroticism and SDL suggests that those participants who were less neurotic (in other words, more emotionally stable) scored higher on SDL.

Considering the differences in inter-correlations between the institutions, it is not surprising that the regression analyses used to predict SDL from the five personality dimensions also generated slightly different findings. For the university group, openness, conscientiousness, and extraversion were significant predictors of SDL, explaining 27% of its variance. For the

college group, openness and extraversion significantly predicted SDL, but the model explained considerably less variance in SDL specifically, 15%. What this suggests is that there are differences between institutions in terms of the specific personality variables that can be used to predict SDL, and also that personality is a more useful predictor of SDL among the university group compared to the college group.

SDL-Personality Correlations for the Overall Sample

A final test of the hypothesis regarding the relationship between SDL and each personality dimension involved the overall sample (university and college subsets combined). While hypotheses predicted that only openness and conscientiousness would correlate significantly (specifically, positively) with SDL, results demonstrated that SDL not only had a weak to moderate positive correlation with openness and conscientiousness, but also with extraversion. Furthermore, a negative weak to moderate relationship was also revealed between SDL and neuroticism. Only agreeableness did not demonstrate a significant relationship with SDL. Similarly, according to a regression equation used to predict SDL from personality for the entire sample, agreeableness was the only nonsignificant predictor; this model explained 21.5% of the variability in SDL scores.

Overall Limitations

An inherent limitation of this study is that its conclusions depend entirely on self-report data, which can be misleading if participants are unable or unwilling to provide accurate information. Another limitation is external validity; these results may not generalize to the general population, as university and college participants may be more homogenous with respect to age, socioeconomic status, or some other relevant variable compared to the broader population. As mentioned, the majority of respondents were female, so the results may also be

less generalizable to males. Males and females did not differ significantly with respect to SDL, a main variable in this study. The sexes also did not differ significantly on the majority of personality variables, which were also measures of particular interest in the study. Females did score higher on agreeableness and conscientiousness, but while these differences were statistically significant, they were not necessarily meaningful. Thus, as a result of the minimal differences in SDL and personality between the sexes, it is possible that the female majority in this study does not prevent generalizability of findings to males.

A further potential limitation related to the generalizability of findings from this study may be the potential selection bias that often characterizes samples of participants who complete online surveys. Since participants in this study had to decide whether or not to complete the online survey, they do not constitute a random sample, also known as a probability sample. Instead, a self-selection survey such as the one used in this research presents the potential for a self-selection bias (Bethlehem, 2010). Since the sample is not necessarily representative of the population it is intended to represent, it is difficult to determine whether sample statistics obtained in the study provide accurate estimates of their corresponding population parameters.

As the purpose of this study was to examine the relationship between SDL and personality, and to use that association to predict SDL using personality, it is important to note that personality was found to explain only a fraction of the variability in SDL. In other words, SDL only partly reflects or overlaps with personality, but a large portion of the construct is not well understood and cannot be predicted from the variables measured in this study. Related to this, another limitation involves the fact that the relationship between SDL and certain personality variables may not even clarify the nature of SDL or assist in defining it more

accurately, as the overlap may reflect a spurious relationship between the two that might be better explained by some third variable not measured in the study.

A final potential limitation is the OCLI itself, which attempts to measure SDL as a component of personality; it may only account for a modest portion of the variability in SDL, specifically, the part of SDL predicted by personality. Other researchers have criticized the OCLI for neglecting other important components, such as cognitive and metacognitive processes, which might also be associated with SDL (Garrison, 1997). Self-efficacy, self-esteem, and even intelligence have been suggested to influence SDL (Cazan & Schiopca, 2014).

Future Research

Ideally, future research would examine variables other than personality that may correlate or even overlap with SDL, as personality appears to account for slightly over 20% of the variability in SDL; in other words, it is clear that other variables must be examined as potential predictors of SDL. As mentioned above, cognitive and metacognitive processes (Garrison, 1997), and self-efficacy, self-esteem, and intelligence (Cazan & Schiopca, 2014) might be logical variables to investigate in terms of their overlap with SDL. Longer tests of personality might also be employed in future research, as the personality measure used in the current study had only 10 items (only two for each of the five personality dimensions). Such a brief measure may not have the psychometric integrity of longer measures, thereby potentially limiting the reliability and validity of each personality dimension to some extent.

Recommendations

The results of this study have the potential to inform theory development, predict who will be most likely to engage in SDL, and also guide instruction. Specifically, the finding that SDL correlates with personality (and with the openness dimension in particular) suggests that

SDL reflects, at least to some degree, personality characteristics like openness to experience (Cazan & Schiopca, 2014). This knowledge can be used in the development of a theory of SDL that recognizes its various components. Furthermore, because personality explains approximately 20 percent of the variability in SDL, according to the findings in this study, these factors can be used to predict which students might be most likely to engage in SDL. Finally, the ability to predict SDL from personality allows instructors to design learning experiences for students based on their readiness for SDL. This is potentially useful, as research suggests that SDL skills improve most when the degree to which the learning environment is structured matches the learner's readiness for SDL (Dynan et al., 2008). SDL can even be developed among secondary school students if teachers focus on actively involving students in schoolwork and teaching them how to learn by guiding them during the learning process (Bolhuis & Voeten, 2001).

Since this study examined the relationship between personality and self-directed learning, namely, the extent to which SDL reflects and can be predicted by personality, it is reasonable to comment briefly on the importance of SDL in itself. SDL has been demonstrated to be a useful predictor of academic achievement, and furthermore, SDL measures can be used to identify different learners' unique needs and thereby contribute to their academic adjustment (Cazan & Schiopca, 2014). The implications of self-direction in learning do not appear to be limited to the classroom either, as research has found those with an SDL orientation to engage in more work-related learning (Gijbels, Raemdonck, Vervecken, 2010). Clearly, SDL is a necessary construct to understand, as the predisposition to be self-directed in one's learning likely influences learning behaviour at school, work, and beyond.

Overall Conclusion

This study demonstrated the most consistent SDL-personality relationship to be between SDL and openness. While other personality dimensions correlated with SDL as well, these relationships were not found for both subsets of the sample and for the overall sample, suggesting that they may be less reliable across populations. The college and university samples were very similar with respect to SDL and the personality dimensions overall, but interestingly, personality was a better predictor of SDL for the university group than the college group, demonstrating that the associations between SDL and personality may vary by population. An interesting difference between institutions was that there were more personality and SDL differences based on demographic variables for the college than the university students, suggesting that demographic variables explained more variability in SDL and personality among the college than the university participants. These differences might reflect demographic differences between the institutions.

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Appendix A: Online Survey: Demographic Variables, SDL, and Personality

Please respond to the following survey questions as honestly and accurately as possible. You can skip any questions you are not comfortable answering. The first section of the survey focuses on demographic information. The second and third parts assess self-directed learning and personality, respectively using Likert style questions.

Demographic Questionnaire

1. Age in years _____
2. Gender identity:

   Male _____

   Female _____

   Transgender _____

   Prefer to self describe _____
3. Marital status:

   Single _____

   Living together _____

   Married _____

   Separated _____

   Divorced _____

   Widowed _____
4. What is the highest level of education you completed prior to beginning your current program?

   Some high school _____

   High school diploma or equivalent _____

   Some postsecondary _____

   Postsecondary diploma _____

   Undergraduate degree _____

   Graduate degree _____

5. What is the highest level of education completed by your father?

    Some high school _____

    High school diploma _____

    Some college/university _____

    College diploma _____

    Undergraduate degree _____

    Graduate degree _____

6. What is the highest level of education completed by your mother?

    Some high school _____

    High school diploma _____

    Some college/university _____

    College diploma _____

    Undergraduate degree _____

    Graduate degree _____

7. At which institution are you currently enrolled?

    College _____

    University _____

8. What program are you enrolled in? _____

9. How many years does it generally take to complete your program? _____

10. Are you enrolled part-time (PT) or full-time (FT)?

    PT _____

    FT _____

11. In which year of your program are you currently enrolled? _____

12. What are your living arrangements during the academic semester?

    Living with parents _____

    Living in residence _____

Living with roommates off campus _____

Living with partner/spouse _____

Other; please specify _____

13. Are you currently employed?

Yes _____

No _____

If **yes**, how many hours do you work, on average, during the academic semester? _____

14. How are you paying for school expenses? (Please check all that apply.)

Student loan (i.e. OSAP) _____

Employment income _____

Scholarships _____

Parental/family contributions _____

Other; please specify _____

15 How are you paying for living expenses (rent, groceries, etc.)? (Please check all that apply.)

Student loan (i.e. OSAP) _____

Employment income _____

Scholarships _____

Parental/family contributions _____

Other; please specify _____

16. What was your overall academic average (%) in your most recently completed academic semester? _____

Oddi Continuing Learning Inventory

	DISAGREE						AGREE
	Strongly	Moderately	Slightly	Undecided	Slightly	Moderately	Strongly
1. I successfully complete tasks I undertake.	1	2	3	4	5	6	7
2. My work is beneficial to society.	1	2	3	4	5	6	7
3. I seek involvement with others in school or work projects.	1	2	3	4	5	6	7
4. I make an effort to learn the meaning of new words I encounter.	1	2	3	4	5	6	7
5. My values and beliefs help me to meet daily challenges.	1	2	3	4	5	6	7
6. I seek the views of others when I am curious about something.	1	2	3	4	5	6	7
7. I have a hobby (such as writing, painting, or making things) which provides me with a means of self-expression.	1	2	3	4	5	6	7
8. I am able to resist the efforts of others to pressure me into doing something I don't want to do.	1	2	3	4	5	6	7
9. I regularly read professional journals.	1	2	3	4	5	6	7
10. I select serious literature (such as history, biographies, or the classics) for my reading pleasure.	1	2	3	4	5	6	7
11. I volunteer for new assignments.	1	2	3	4	5	6	7
12. I'm not comfortable with my performance on an assignment until my supervisor, teacher, or colleague says it's acceptable.	1	2	3	4	5	6	7

	DISAGREE						AGREE
	Strongly	Moderately	Slightly	Undecided	Slightly	Moderately	Strongly
13. I have been an eager reader since chi1dhood.	1	2	3	4	5	6	7
14. After I read a book or see a play or a film, I talk to others to see what they think about it.	1	2	3	4	5	6	7
15. I resist judging others (such as new managers or teachers) until I've had an opportunity to associate with them.	1	2	3	4	5	6	7
16. When I do a job well, it's because I have been prepared and have put in personal effort.	1	2	3	4	5	6	7
17. I find it difficult to judge if I've performed wel1 or poorly on a task such as giving a speech, writing a paper, or answering a test question.	1	2	3	4	5	6	7
18. Once I start to work on a task, I keep working until it's done to my satisfaction.	1	2	3	4	5	6	7
19. I read an average of one or more national news magazines each week.	1	2	3	4	5	6	7
20. When in school, I tend to have difficulty in estimating whether or not the teacher is going to like my work.	1	2	3	4	5	6	7
21. I find it useful to think about people (or refer to them) according to categories (such as by education, occupation, race, or ethnic background).	1	2	3	4	5	6	7

	DISAGREE						AGREE
	Strongly	Moderately	Slightly	Undecided	Slightly	Moderately	Strongly
22. I work more effectively if I have freedom to regulate myself.	1	2	3	4	5	6	7
23. I make an effort to meet new people.	1	2	3	4	5	6	7
24. Being afraid to take a chance has prevented me from doing something I have wanted to do at some time in my life.	1	2	3	4	5	6	7

Ten-Item Personality Inventory - (TIPI)

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

I see myself as:

1. _____ Extraverted, enthusiastic.

2. _____ Critical, quarrelsome.

3. _____ Dependable, self-disciplined.

4. _____ Anxious, easily upset.

5. _____ Open to new experiences, complex.

6. _____ Reserved, quiet.

7. _____ Sympathetic, warm.

8. _____ Disorganized, careless.

9. _____ Calm, emotionally stable.

10. _____ Conventional, uncreative.

Appendix B: Participant Information Letter and Consent Form

Dear Student,

You are invited to participate in a research project entitled: *Self-Directed Learning as a Personality Construct*, conducted by Anna-Liisa Mottonen, a PhD in Education student under the supervision of Dr. Glenda L. Black at Nipissing University. If you have any questions or concerns about this research, please feel free to contact [redacted]

Purpose of the Project:

The purpose of this research project is to examine the relationship between personality and self-directed learning. Specifically, data will be collected from first year postsecondary students to identify which specific personality traits, if any, are related to and predictive of self-directed learning propensity. This project will hopefully help to improve our understanding of what makes some people more interested in self-directed learning than others, and will also serve as my PhD dissertation project.

Participation Procedures:

If you agree to participate in this study, you will be asked to complete a questionnaire, located using the link in this email, that gathers demographic data as well as information about your personality and propensity for self-directed learning. The questionnaire will likely take fewer than 20 minutes to complete.

Potential Benefits of Participation:

If you choose to participate in this study, you will have the opportunity to learn something about your personality and self-directed learning potential. The results of this research project may also provide insight into how personality and self-directed learning are related, and may allow readiness for SDL to be predicted from personality traits.

By emailing me at [redacted] with a request for your results, I will reply with an overview of your results at the completion of the study, as long as you have included your name and email address on the questionnaire.

[redacted]

Potential Risks of Participation:

There are minimal risks of psychological harm associated with participation in this study. There is a slight possibility that students may experience distress in response to the information they learn about themselves through their involvement in this research. Participants have the option not to respond to any question they are not comfortable answering.

If they experience any distress associated with their results, participants attending the university are encouraged to contact the university's student counselling services by visiting room [redacted] while participants attending the college are encouraged to contact the college's student success services by visiting room [redacted] or booking an appointment by phone: [redacted]

Voluntary Participation and Freedom to Withdraw without Penalty:

Your participation in this research project is voluntary. If you choose to participate, you have the right to withdraw at any time without consequence. Similarly, you may choose not to participate without penalty. If you are a current student of the principal or co-investigator, please rest assured that your choice to participate (or not participate) will have no impact on your course grades or on any other aspect of your academic life.

Confidentiality:

Your identity and any information you provide for this study will remain confidential. Your email address will be associated with a unique code so that your results can be emailed to you, but your email address and its associated code will be kept private. These pieces of identifying information will be recorded on a master list that will be kept in a secure location that is accessibly only to me. All of the responses you provide will be associated only by your code, not your name or email. Also, in the dissertation itself, and in any associated publications or presentations, all data will be aggregated, so it will be impossible to identify any individuals who participated in the study.

Informed Consent to Participate in this Research Project

As a participant in this research project, I understand that I am agreeing to complete the questionnaire linked to this email, and that my data will be collected, used, and stored for the aforementioned purpose. I understand that my participation in this study is voluntary, that I may withdraw my participation in this project at any time without consequence, and that effort is being put forth to ensure your confidentiality. I have read this Information Letter and Consent Form and have had any questions, concerns, or complaints addressed to my satisfaction. I have been provided an emailed copy of this letter.

By clicking on the attached link and completing the questionnaire, I am consenting to participate in this research project and allow my data to be used for the purpose of this dissertation.